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1896.
An Illustrated Catalogue
OF
MICROSCOPES,
Objectives and Accessory Apparatus,
MANUFACTURED AND SUPPLIED BY
W. WATSON & SONS,
Opticians to Her Majesty's Government,
313, HIGH HOLBORN, LONDON, W.C.

(Two Doors from Chancery Lane),
AND

78, Swanston Street, Melbourne, Australia.

ESTABLISHED 1837.

AWARDED

THREE HIGHEST AWARDS at the World's Columbian Exhibition, Chicago, 1893.

THE GRAND PRIX at the Antwerp International Exhibition, 1894.

TWO GOLD MEDALS—Paris Universal Exhibition, 1889.

TWO DIPLOMAS OF HONOUR (a degree higher than Gold Medal), including the only Diploma of Honour awarded for Microscope Stands, at the International Exhibition of Microscopes, Antwerp, 1891.

THE [ONLY GOLD MEDAL for Microscopes, South African and International Exhibition, 1892.

THE ONLY GOLD MEDAL for Microscopes, Liverpool International Exhibition, 1886.

THE ONLY GOLD MEDAL for Microscopes, Melbourne Centennial Exhibition, 1888.

TWENTY-SEVEN GOLD AND OTHER MEDALS at various International Exhibitions, including London, Glasgow, Adelaide, Calcutta, Amsterdam, &c.

NINE TIMES PLACED ALONE AT EXHIBITIONS, receiving a Higher Award than any other Exhibitors showing similar Goods.

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HOURS OF BUSINESS: 9 A.M. TO 7 P.M.

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1896

W. WATSON & SONS

Publish a Classified List of

Microscopic Objects,

Representing a Stock of

FIFTY THOUSAND SLIDES,

All of the very highest class, many of them extremely rare and choice, forming undoubtedly the

FINEST COLLECTION in the WORLD,

Enabling them to offer to purchasers a selection never previously equalled.

W. WATSON & SONS make a Speciality of **EDUCATIONAL SLIDES**, and the utmost care and supervision is exercised that they shall be **EXACTLY TYPICAL** of the structures they represent.

The above List will be sent Post Free to any address on Application.

MICROSCOPES AND APPARATUS

For any Special Requirements made promptly to Order.

ESTIMATES FURNISHED ON APPLICATION.

Microscopes and Objectives of any maker supplied to order at list prices.

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BUSINESS TERMS.

All goods are marked at **Net prices** for **Cash**, the small profit over cost manufacture admitting of **NO DISCOUNT**.

Country and Foreign Orders must be accompanied by a remittance in full, or a satisfactory London **Trade Reference**.

Remittances may be made by Cheques, crossed London & County Bank, also by Postal Orders or Post Office Orders payable at the General Post Office. These also should be crossed.

Customers residing abroad will find a Banker's Draft, drawn on a London Agent at sight (which may be obtained at any Bank), or Post Office Orders, the most advantageous method of sending Cash. On large Foreign Orders, to suit the convenience of Customers, we accept a payment of 25 per cent. of the value with the order, and draw for the balance through a Banker against delivery of the Bills of Lading, or instruct the Carriers to collect against delivery of the Goods, whichever may be preferred.

Where Instruments or Apparatus have to be made specially to order, and vary from our regular Catalogue patterns, a deposit of 25 per cent. of the approximate cost must be paid.

All the goods quoted in this Catalogue are ordinarily kept in stock, so can be at once forwarded on receipt of remittance for price. But in the event of any goods being temporarily out of stock, the order will be promptly acknowledged, and the probable date of delivery given.

It is desirable that the Names and Addresses of Customers should be distinctly written.

Microscopes are packed and delivered free on rail London (except where otherwise stated). For **Export Orders**, tin-lined cases will be charged at cost price.

The cost of **tin-lined** cases for the various Instruments mentioned in this list will be approximately as follows:—

The Van Heurck Microscope	...	...	...	£0	7	6
The Edinburgh Student's Microscope	...	...	...	0	5	6
The Histological Microscope	...	...	...	0	4	6
The "Swinging Sub-stage," the "Scientist's," and "Research" Microscopes	...	...	...	0	9	6
Either of the Photo-Micrographic Cameras	...	...	...	0	15	0

Where two Microscopes are ordered one-third extra on the price of the packing case of one as quoted above will be charged, three microscopes two-thirds additional, and so on.

In the absence of specific instructions, goods are despatched by the route that commends itself to our judgment as the most expeditious, secure and economical. We employ skilled packers only, and use every precaution to ensure safe transit. All goods are sent at the risk of the consignee.

ADDRESS.

IN submitting a new Edition of our Catalogue we would call special attention to the fact that our aim is to supply goods of the very finest quality and workmanship only, and which shall be unsurpassed by any other house.

That we have been successful in our endeavours is established by the very large and increasing demand for our Microscopes and apparatus, the numerous testimonials we have received concerning them, also the success that has attended our Exhibits in all parts of the world at the principal International Exhibitions. The fact that we have been awarded 38 Medals in open competition, and have **NINE** times been placed alone, receiving a higher award than any other Exhibitors showing similar goods, bespeaks the high quality of our manufactures.

Having factories fitted with steam power, probably the largest and most complete in Europe for the manufacture of Optical Instruments, employing skilled workmen only, and having machinery specially designed for our purposes, we are not only able to supply goods of the highest quality, but also to turn them out very economically, and give exceedingly full value for the price charged.

We would direct special attention to our New Series of

“Parachromatic Objectives.”

They are most brilliant in performance, the numerical aperture is, in every case, large, while by systematic working and the production of large quantities, we are able to supply at exceedingly low prices.

All orders entrusted to us will receive our most careful and prompt attention.

W. WATSON & SONS.

2nd March, 1896.

The following New Instruments and Apparatus are contained in this Catalogue—

	PAGES
The Grand Model Van Heurck Microscope ...	15 to 17
Centering Underfitting for Student's Microscopes ...	34
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NOTICE.—When a large number of Microscopes are required, we are willing to make any special design that may be desired and to give estimates for same.

SCIENCE AND ART DEPARTMENT—SOUTH KENSINGTON.

We are agents to the above Department for the supply of apparatus to Science Classes, towards the purchase of which the Department grants an aid of 50 per cent.

Directions to Teachers and Secretaries.

Write to the Department for Form 49; fill in the Form for the apparatus required, with prices attached, and forward to us. We shall then pass it on to the Department for their approval and amount of aid. On receipt of same from the Department an invoice will be forwarded by us with the amount of aid deducted, which should be returned at once, accompanied by a remittance for the amount, when the goods will be despatched without delay. On receipt of the goods fill in Form 49a, and return to us.

Remarks concerning the construction of W. WATSON & SONS' MICROSCOPES.

The advances that have been made in the optical part of the Microscope have necessitated the introduction of mechanical conveniences for the manipulation of same, and to the scientific worker these are of great assistance, for they enable results to be obtained and work done which could not otherwise be accomplished without great difficulty and inconvenience. These accessories the amateur oftentimes would not care to have, or be disposed to pay for, and they certainly are not within the reach of the average student. It is, therefore, our aim, while meeting the higher requirements of the Savant, to also supply Instruments suitable for the Amateur and Student. It must not be inferred because an Instrument is not furnished with every mechanical contrivance that no good work is possible with it; on the contrary, original and highly valuable research has oftentimes been conducted with the very plainest of apparatus. At the same time, it is absolutely essential that even the simplest Instrument shall be thoroughly sound and accurate in workmanship, and with this in mind, we make only Microscopes capable of working with the highest powers, and of receiving accessories to make them complete, so that if one of our cheapest Students' Instruments be purchased and it be desired later on to add further apparatus, such can be conveniently fitted and efficiently employed.

We would specially mention that in our workshops we make a rule of turning out ONE UNIFORM QUALITY OF WORK ONLY,—THE VERY BEST,—so that whether a Van Heurck or a Histological Microscope be purchased, the same quality of workmanship obtains in both, the disparity in price being caused by the difference in style of finish, and the extra mechanical conveniences that are fitted; under no circumstances do we turn out any work of inferior quality. Purchasers may, therefore, buy even the lower priced models, with the assurance that they are capable of good work, and that the lowness in price does not indicate in our Instruments a diminution of quality.

We wish specially to draw attention to the system of

FINE ADJUSTMENT

adopted in our Microscopes. This is probably the most important movement in the Instrument, and has received our most deliberate consideration. We have now employed it for upwards of twelve years, and although we have tested all the well-known forms, we have not met with one that is so sensitive and precise in its action, and so little subject to depreciation by wear. This is further confirmed by the many encomiums we have received from customers who have worked with it for an extended period, some of which will be found in this Catalogue (see pages 18-20, 47-49, 53, 102). The entire body is raised or lowered by means of a milled-head fixed to a screw having a hardened steel point, acting on a lever (the contact surfaces of which are hardened and polished) against a point attached to the body-slide, in a perfect dovetailed fitting, about $2\frac{1}{2}$ inches long. The principle of it is shown in the accompanying figure (page 4).

At first sight it would appear that the screw controlling this important movement had to bear the entire weight of the body of the Instrument as in the Continental models. This is a common error, but not in accordance with fact. The turning of the milled-head screw actuates a hardened steel lever (B), varying in length according to the size of the Instrument, the fulcrum (C) of which is placed as closely as possible to the sliding fitting in which the movement of the body takes place, whereby the weight carried by the milled-head is reduced to considerably less than in any other form. For instance, in our Edinburgh Student's Microscope—a section of a limb of which is shown on page 4—the total length of the lever arms is $2\frac{1}{8}$ in., the arm on the one side being $\frac{3}{8}$ in. long, and on the other $1\frac{1}{8}$ in. The weight of the body, fittings, &c., is 17ozs. The resistance at the end of the lever is therefore $3\frac{3}{4}$ ozs. We have not included the reactionary spring in these figures, as this is employed in all forms of Fine Adjustment, but the resistance of this is minimised at the point of force, in the same ratio as the weight. Also by means of the long lever an *extremely slow motion* is obtained, the movement being lessened in the same proportion as the weight. This renders our Instruments specially suitable for investigations with the highest power objectives; also in Photo-Micrographic work its reliability is unsurpassed, not being liable to vary during exposure.

An important feature in our fine adjustment is, that in using it the DISTANCE BETWEEN THE EYE-PIECE and OBJECTIVE REMAINS UNALTERED.

Section of Limb of Edinburgh Student's Microscope showing construction of Fine Adjustment.

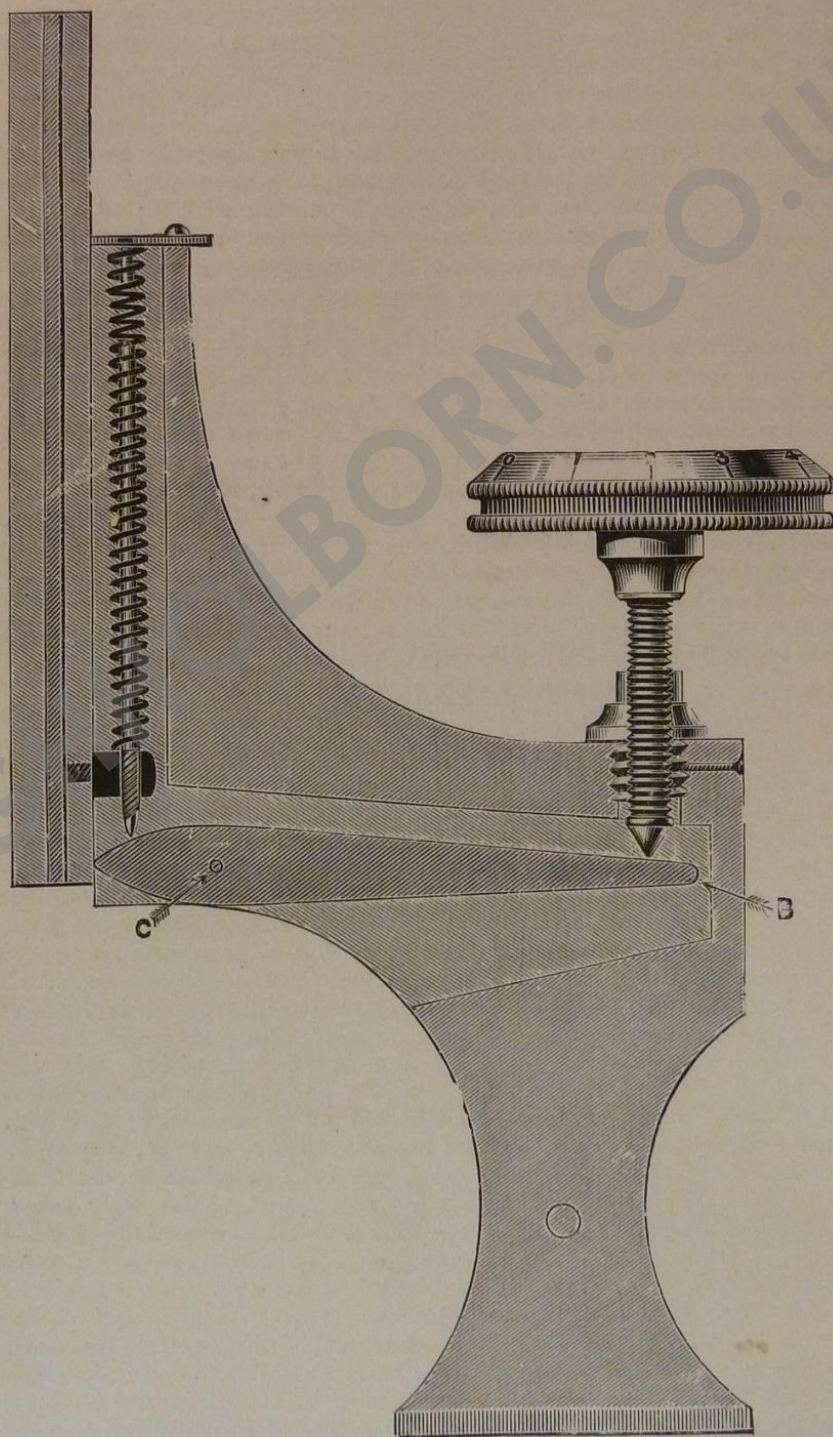


FIG. 1.

Other points of convenience in the construction of our Fine Adjustment are:—
Owing to the position of the controlling milled-head on the Limb, it can be worked with either hand.

Being in a fixed position on the Limb and not carried by the coarse adjustment as many other forms are, connection with the Focussing Rod of a Photo-Micro. Camera can be conveniently and readily made.

The Thread being a left-handed one, the turning of the milled-head effects the movement through the *Lever* in the same direction as a *direct acting* Fine Adjustment. This is an advantage, especially in Laboratories where several patterns of Instruments are in use, the opposite motion caused by a Lever being likely to be overlooked and specimens broken. This obviates such risks.

All Fine Adjustments must wear in course of time as the result of friction, and in the majority of cases they cannot be set right, except by the maker or a skilled mechanic. In our form, the fitting is sprung and has two screws (shown in Fig. 2, "A"), by means of which any wear as the result of friction can be at once taken up by the user. This is of the greatest importance to residents abroad, the necessity for returning an Instrument to be adjusted being obviated.

ALL THE FRICTIONAL PARTS

of our Microscopes have spring slots to the dovetailed fittings, in which compensating screws are fitted. Should any slackness arise after an extended period of use, a slight turn of these screws tightens the bearings, and the user has at his disposal the means of readily and satisfactorily adjusting his own Microscope. These screws are fitted to the bearings of the Mechanical Stage, Sub-stage, Body Tube, and Fine Adjustments. Also we provide controlling screws to all the pinions and threads, so that their tension may be varied to suit individual tastes. This principle is carried out more thoroughly in our Microscopes than in those of any other maker, and the advantage that is yielded by it has been recognised on many occasions by workers with our instruments, and it is one that cannot be over-estimated by the practical worker.

THE FORM OF THE LIMB

we adopt is that popularly known as the "Jackson Model." It gives a long solid support to the tube of the Microscope, so minimising the vibration at the eye-piece end; for Photo-Micrography, or any work requiring the use of high powers, the "Jackson Limb" is unsurpassed.

THE SUB-STAGE.

All our Microscopes are provided with a means of carrying the Condenser, Polariser, and other Illuminating Apparatus. In the cheaper instruments this consists of an "underfitting" or tube, which is attached to the underside of the Stage, and in the more complete forms a Compound Sub-stage is supplied, by means of which the apparatus can be exactly centred with the objective, and focussed by rackwork. These are both of the "universal size"—1½ in., full, inside diameter—as arranged by the Royal Microscopical Society. The Instrument figured (page 11), has a Sub-stage, while that shown (page 30) has a tube fitting.

It will be noticed that we supply several different forms of

BASE OR FOOT.

All of them have special merit, and are so constructed as to be rigid in any position. Of these, that as shown on the Edinburgh Student's Microscope (page 28), known as the Continental or horse-shoe form, has a popularity unequalled by any other pattern, and is preferred before all others in laboratories, and by students. It is very compact, making the Instrument exceedingly portable (the spread of the feet of other patterns necessitating large cases). This is of great importance to students, who have often to carry their Instruments about. In this form also there is an advantage gained in space for Sub-stage movements, the pillar support not coming in the way.

Further Extract from the Journal of the Royal Microscopical Society, February, 1893, page 95.
"The essential point of a microscope is the springing of the dovetail grooves. . . . In Watson's microscopes we have two spring sides, one for the coarse adjustment, and one for the fine. The moment either movement exhibits the slightest sign of wear the slack can be immediately taken up by tightening the screws. There is no reason, therefore, why in years to come this Instrument should not work as well as it does to-day."

But it is not so perfectly rigid in all positions to which the Instrument may be inclined for working as the Tripod foot, which we now fit to the Van Heurck Microscope (page 11), and the Series of Edinburgh Student's Microscopes (pages 25 to 49), and we are confident that the absolute firmness afforded by this form of support will in time, as its merits become more widely known, cause it to be fitted to all classes of Microscopes.

The Jackson form of foot is employed in others, that fitted to the Scientist's Microscope (page 62), it will be noticed, having a forward curve at the top, giving extreme stability in any position. This we can also very strongly recommend. Personal choice and opinion necessitates the making of different designs of bases or feet, and in this list all the most efficient forms will be found.

THE COARSE ADJUSTMENT

fitted to our Instruments is as shown in Fig. 2, and is effected by means of a

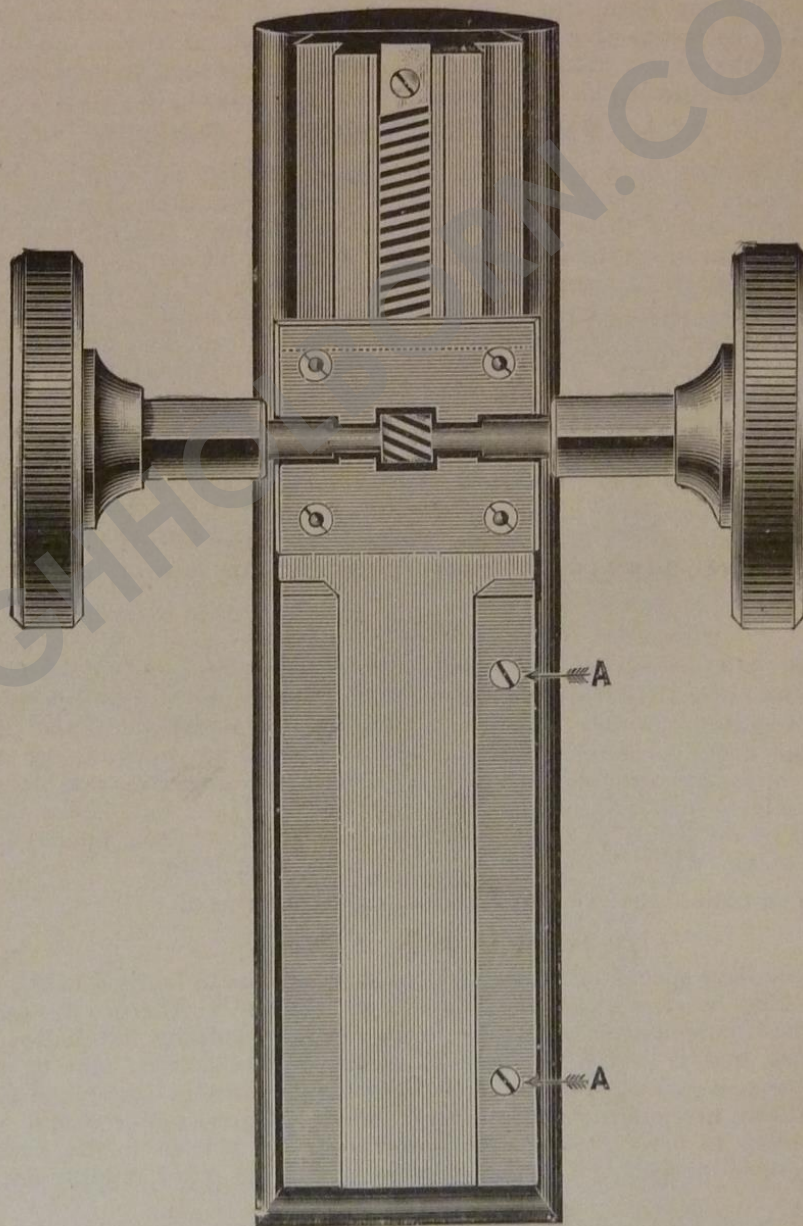


FIG. 2.

Diagonal rack and Spiral pinion, which ensures the smoothest possible motion, and an entire absence of backlash, the teeth of the pinion never leaving the rack. High powers can be exactly focussed by its means, without the aid of the Fine Adjustment.

THE BODY TUBE.

This we make in two diameters only, to our regular stock Instruments, viz. : Edinburgh Student's and Histological Microscopes, 0.92 inch, all other Instruments, 1.35 inch (the sizes recommended by the Royal Microscopical Society), but we are willing at all times to make any special size of Body Tube desired by Customers, to order. The thread for Objectives is in all our Microscopes of the Royal Microscopical Society's "Universal Size."

The improvement in the construction of Objectives and consequent sensitiveness to thickness of Cover glass has necessitated the introduction of the

MECHANICAL DRAW TUBE.

In cases where this is fitted we supply in addition, a sliding Draw Tube giving an extreme range of adjustment. Such Instruments can be used for Objectives of either Continental or English make, the Body being shorter than the former length—6 inches—and with the Draw Tubes extended, beyond the English length—10 inches—allowing of the adjustment for thickness of Cover glass by variation of Tube length, the rackwork Draw Tube affording means for effecting this in the most precise manner. For the use of Students we have devised a cheap form of rackwork Draw Tube, as per page 40, which we fit to the Edinburgh Student's Microscopes, at an extra cost of 25/-, but this can only be done where the Eye-piece is of the usual size—0.92 inch—otherwise the Body would be too large.

ALUMINIUM.

This alloy is coming considerably into use, but it is questionable what parts in a Microscope can be constructed of it without sacrificing rigidity or durability. We are willing to make any portions of our Instruments in Aluminium to order, and at present consider it can be advantageously employed for the Draw Tubes and Milled-heads, but anything else can be added if desired, and we shall be pleased to submit estimates for such work. It will be noted that we already make many of the accessories in Aluminium (and especially would we point this out in connection with our Sub-stage Condensers, pages 75 and 76), and as occasion offers shall increase same.

Among the Instruments quoted in this list we would call special attention to the

VAN HEURCK MICROSCOPE (pages 8-21).

This embodies every requirement of the most critical worker, and for extreme convenience of design, perfection of movements, and stability, it is unexcelled. We have supplied it to many of the most noted Microscopists in England, America, India, and South Africa, and its numerous advantages have gained for it a reputation and demand exceeding we believe any other high class Instrument.

In our well-known

EDINBURGH STUDENT'S SERIES

(pages 25-49) will be found Instruments in varying degrees of completeness meeting the student's and serious worker's requirements in the highest degree. For compactness, convenience in design, completeness in detail, and perfection in both optical and mechanical parts, they are unsurpassed. To the

HISTOLOGICAL MICROSCOPE

(pages 50-53) we have fitted a larger stage and made some alterations in detail; the demand for it testifies that our endeavour to supply a highest class Microscope for Students at a comparatively nominal price has not been without approval.

Extract from the Report of the Jury of the International Exhibition of Microscopes, Antwerp, 1891, at which we were awarded the only Diploma of Honour for Microscopic Stands (Class I.), and Diploma of Honour for Microscopic Objects (Class VIII.).

(Class I.) "This firm competed only in Microscope Stands, of which more than twenty were exhibited. They are adapted according to their different numbers and designs for the various necessities of microscopical work. The perfection of the workmanship is extraordinary, and the Fine Adjustment to the body, which is effected by means of a lever actuated by a Micrometer screw, is of incomparable slowness and precision.

"Among the Instruments exhibited is a stand named the Van Heurck Microscope, having been constructed after the ideas of this Micrographer, which the Jury found very remarkable. The elegance of this Instrument, the extreme precision of all its movements, the facilities for using it both visually and for Photo-Micrography, finally its relatively modest price, have influenced the jury in awarding to Messrs. W. WATSON & SONS the high recompense attributed to them."

DR. HENRI VAN HEURCK'S MICROSCOPE for PHOTOGRAPHY & HIGH-POWER WORK.

(REGISTERED NO. 169,421.)

(See Testimonials and Opinions, pages 18 to 20.)

This Microscope is perfect for both Photographic purposes and ordinary research.

It is absolutely rigid throughout.

It is exceedingly compact, yet combines every convenience for the most delicate and precise work.

It is the only Microscope having Fine Adjustments for Body and Sub-stage, which are so placed as to be both conveniently controlled by the fingers of one hand without having to alter the position of the hand.

The Fine Adjustments are of the utmost perfection and sensitiveness.

THIS Microscope was first made by us specially to the specification and order of Dr. Henri Van Heurck, the celebrated Microscopist, of the Botanical Gardens, Antwerp, for his delicate investigation and high-power Photographic work. Several good forms of Instruments have been made for Photographic work, but in such a manner that they are only useful for this purpose, and cannot be used for ordinary visual work. This Microscope has been designed to be of the highest possible efficiency for both purposes.

Photo-Micrography, with high powers, demands the greatest convenience in the adjustments, and the very highest excellence in the mechanical working. This has been provided in the most absolutely perfect manner, while the same perfection of movements, when the Instrument is used in the ordinary visual manner, cause it to be suitable for work of the very greatest delicacy.

It is a Microscope specially suitable for the laboratory, or where absolute reliance has to be placed in results obtained, and to any one doing delicate work, this Instrument will be found the most convenient yet constructed.

The Instrument throughout has been made with special patterns; every detail has been modelled for it, and no pains have been spared to render it absolutely perfect. The workmanship throughout is the very finest it is possible to turn out.

The following are some of its special features:—

THE COARSE ADJUSTMENT

is by our improved Spiral Rack and Pinion as described, page 6, and permits of the use of a 4in. objective.

THE FINE ADJUSTMENT

is our improved form as described, page 3, but is made with an extra long lever, so imparting an extremely slow movement.

The milled-head is divided to $\frac{1}{100}$ ths, and one turn of it moves the body, up or down, the $\frac{1}{10}$ th of a millimetre = $\frac{1}{333}$ rd of an inch. The Adjustment is sensitive to the $\frac{1}{100}$ th of a turn of the milled-head, which would give the $\frac{1}{3300}$ th of a millimetre = $\frac{1}{33300}$ th of an inch of motion. There is also another point in this Fine Adjustment. It is necessary for Photographic purposes that an object once focussed sharply shall absolutely remain so during the term of the exposure. In nearly

every form of Fine Adjustment, an object left focussed for a minute or two will be found to have slightly varied, owing to the flexion on the metal, caused by the weight of the Object Glass, &c. Our Fine Adjustment will be found to be perfectly invariable, and it is the only form we know of that will remain so. The Fine Adjustment milled-head has a milled groove in it for connecting with the focussing rod of a Camera, and has its value engraved on it, also arrows showing the direction of movement imparted.

THE BODY

is provided with **two Draw-tubes**, one actuated by **Rackwork**, and the other sliding inside it. The advantage of having these is, that the body can be made very short or extremely long, and that sufficient latitude can be obtained to use Objectives corrected for either Continental or English tube lengths, and to adjust same for thickness of cover glass by variation of tube length. If the cover glass be thicker than that for which the Objective is corrected a shorter tube length is necessary, if it be thinner the body must be lengthened. This can be done in the most precise manner by means of the rackwork draw-tube. The length of the body when closed is 142 millimetres ($5\frac{5}{8}$ in.), and when the two draw-tubes are extended, 305 millimetres (12 inches), being, therefore, shorter than the Continental and longer than the English tube lengths. Both draw-tubes are divided to millimetres, and on the rackwork draw-tube a double scale is engraved, reading continuously from the sliding draw-tube when fully drawn out, or giving the body length when the rackwork draw-tube alone is in use. The utility of this mechanical draw-tube cannot be over-estimated in any Microscope. It permits of quick manipulation and gives the most perfect results.

The inside top of the draw-tube is smaller than the remainder, the former making a fitting for the Eye-piece about 1 in. long, permitting of the tube being blackened inside up to this fitting thus minimising reflection. The end of the draw-tube has the universal screw for using the Apertometer, &c., and the nose-piece is made removable by unscrewing.

THE STAGE

has mechanical movements of the most perfectly sensitive description it is possible to make, giving 1 in. of motion in either direction; it also has concentric rotation. It is of new design, very thin in construction, but absolutely rigid. On the surface, sliding in planed dovetailed grooves, is an Object Carrier, with a screw to fix it when central, and a side-pin for the slide to go against when using a Finder. It has a large central aperture, so that the working distance of the Objective may be felt while focussing. To reduce vibration to a minimum, the Instrument has been built with one part fitting into another and not merely screwed to it, rendering it as solid as though it were one piece of metal throughout. The Bracket carrying the Stage, instead of being screwed on to the front of the Limb, as is usually done, is made in a solid casting, taking the Sub-stage beneath, and going right *into* the joint at the top of the Pillar.

THE LIMB

is fitted *into* the Stage Bracket, held firmly by screws, and the joint bolt of the Pillar goes through the whole—Limb and Stage Bracket—rendering the Limb, Stage and Sub-stage as firm as if they were *one piece*, and we venture to say that it is quite unequalled in this respect.

THE SUB-STAGE

is made specially for the Instrument, and is of extra strong build. It has rectangular screw adjustments to centre, very fine rackwork to coarse focus, and is provided with a *Fine Adjustment*, working on the same principle as that supplied to the Body. This is a very great convenience, it being a most difficult matter when using a high power Objective and exchanging an object for one having a different thickness of Slip to that for which the Sub-stage Condenser has been adjusted, to alter the focus of the latter the slight necessary amount. The vibration imparted to the Instrument in so doing often prevents the best effect being obtained. If, however, this movement be effected by means of a Lever Fine Adjustment, the hand does not press on a point affecting the optical portions and there is no consequent vibration, the adjustment can then be made with the utmost nicety. This Fine Adjustment works by a milled-head from the upper surface of the Stage, it can therefore be used at the same time as the body Fine Adjustment, and this is

THE ONLY INSTRUMENT

in which these two motions can be controlled by one hand, without having to alter its position, that is, without moving the hand the two adjustments can be controlled by the thumb and fingers. The advantage of this is, of course, inestimable, and will at once be appreciated.

ALL THE MOTIONS

can be controlled with one hand on the right-hand side of the Instrument, and are fitted with screws to compensate for wear and tear, and by just giving these a slight turn, the user can re-adjust the bearings—should they require it after long usage—without returning the Microscope to us.

THE MIRRORS,

which are plane and concave, are mounted on a swinging arm, so that they may be turned aside when direct illumination from the lamp is required.

When in the

HORIZONTAL POSITION

the Instrument is quite steady. The Stage Bracket being carried below the centre of the Pillar Joint brings the Stage itself exactly on the centre, so balancing the parts equally.

There is a steel clamping bar for fixing the Instrument at any angle of inclination.

As it is occasionally asked for, we make a Δ shaped Frame with levelling screws, to attach by means of a screw, fitted to every Instrument, at the top of the Limb at the back of the Body, so this frame can be adapted at any time. (See illustration, page 98.)

THE FOOT.

The original Foot constructed to this Instrument was the Continental form, but the Tripod shown, page 11, has met with so much favour and is so strongly recommended by several leading Microscopists, that it has superseded the other in this Instrument. We, therefore, shall not in future stock these Instruments with the horse-shoe form of foot, but shall be willing to make them specially to order. At the points of contact with the table the foot is provided with cork pads, insulating it from vibration, preventing the Instrument slipping, and the table from being scratched.

ALL THE FITTINGS

are of the universal size.

The Instrument is made in two forms :—

The Van Heurck Microscope, Stand "B."

The Grand Model Van Heurck Microscope.

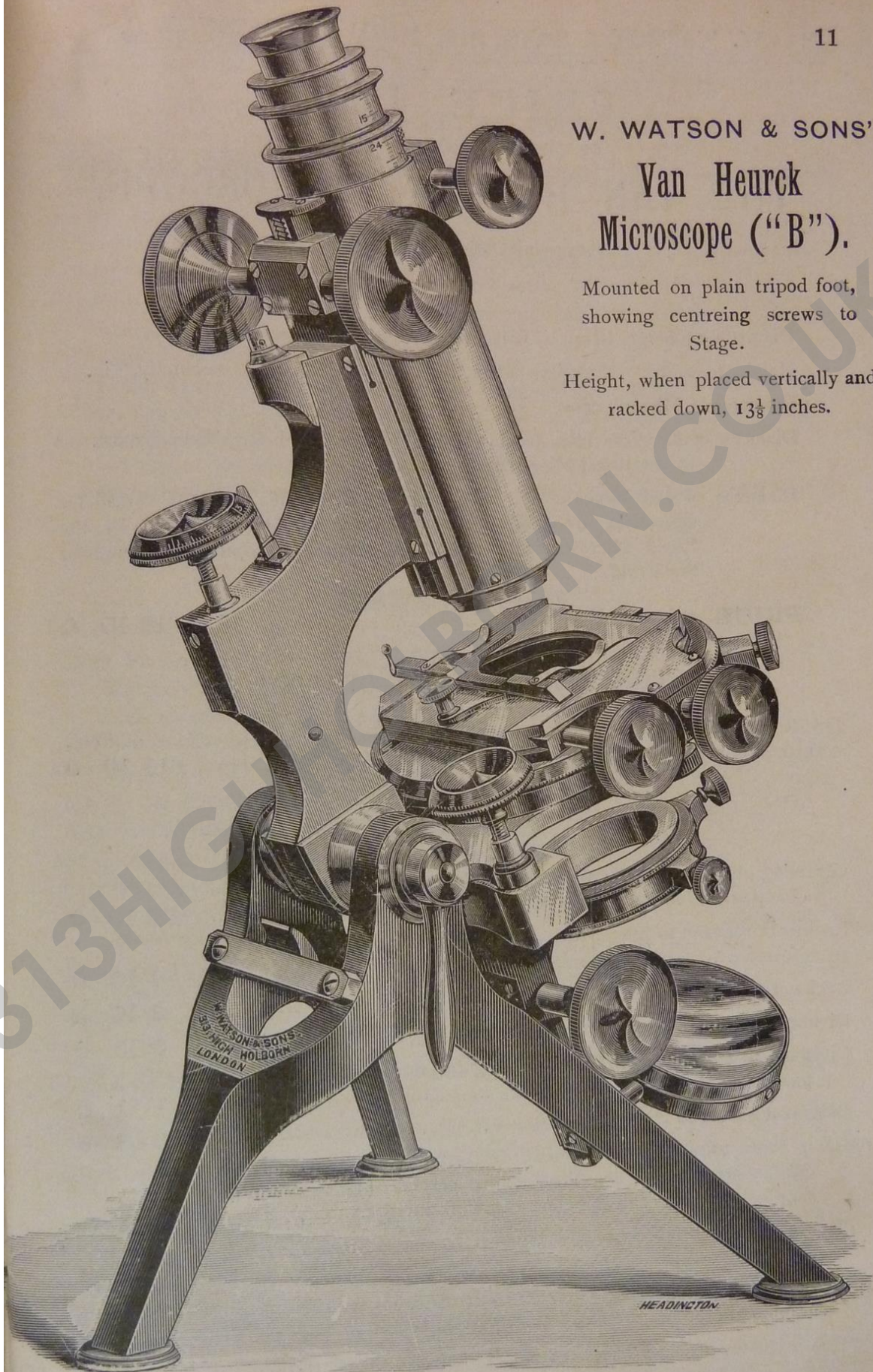
For prices see pages 12 to 17.

W. WATSON & SONS'

Van Heurck
Microscope ("B").

Mounted on plain tripod foot,
showing centring screws to
Stage.

Height, when placed vertically and
racked down, $13\frac{1}{8}$ inches.



For prices see pages 12 and 13.

PRICE LIST

OF (W. WATSON & SONS')

THE VAN HEURCK MICROSCOPE.

Stand "B."

As described pages 8 to 10, and figured page 11.

Diameter of Stage, $4\frac{1}{2}$ in. Diameter of Central Aperture, $1\frac{7}{8}$ in.

Height to centre of Eyepiece when the Instrument is set horizontally, in.

Diameter of Mirrors, $2\frac{3}{8}$ in.

Diameter of Eyepiece tube, inside 1.35in. (This is the large size recommended by the Royal Microscopical Society.)

Diameter of Sub-stage fitting, inside $1\frac{1}{2}$ in. full. (This and the thread for Objectives are both of the universal size recommended by the Royal Microscopical Society and adopted by opticians throughout the world.)

PRICE, with One Eyepiece	£18 10 0
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CONTINENTAL FORM OF FOOT.

This Instrument may be had to order with the Continental Horse-shoe form of Foot, as figured on page 14, at the same price as with the Tripod Foot above, £18 10 0

EXTRAS.

Centring screws to Stage, as shown on Instrument, page 11, and clamp screws to fix Stage when centred	...	...	...	...	£2 10 0
Rackwork rotation to Stage, with means of throwing pinion in and out of gear	...	...	...	...	1 10 0
Rackwork rotation to Sub-stage	...	...	...	...	1 10 0
Dividing rotation of Stage to degrees, reading by verniers to 5 minutes	...	...	...	...	0 15 0
Divisions to movements of Stage, reading by verniers to the $\frac{1}{10}$ th of millimetre	...	...	...	...	1 1 0
Maltwood Finder in morocco case	...	...	...	...	0 6 6
Clamp Screw to centring movement of Sub-stage so that a Condenser once centred cannot be shifted out of centre. (This cannot be supplied when the sub-stage has rackwork rotation)	...	...	...	...	0 2 6
Plate to fit in dove-tailed grooves, to cover surface of Stage, for rough work	...	...	...	...	0 17 6
*Frame with levelling screws to clamp the Instrument to, when photographing in the horizontal position. (See illustration, page 98)	...	...	...	...	1 10 0

*This is not an absolute necessity, but is desired by some workers. It can be had to fit at any time.

WATSON & SONS'

VAN HEURCK MICROSCOPE (Stand "B.")—*continued.*

EXHIBITION MODEL.

"B" Van Heurck Microscope on Tripod form of foot, fitted with centreing screws to Stage, and clamp screws to fix Stage when centred. Rackwork rotation to Stage, with means of throwing pinion in and out of gear. Rotation of Stage divided to degrees, reading by verniers to five minutes. Divisions to movements of Stage, reading by verniers to $\frac{1}{10}$ th of a millimetre. Rackwork rotation to Sub-stage, finished in bright polished lacquered brass throughout in the very best manner. Fitted with one Eye-piece... £37 10 0

This is extremely handsome and suitable for presentation.

BINOCULAR BODY.

Extra Binocular body to either of the above Instruments to interchange with the Monocular, the latter being racked out from its bearings and the former replacing it, so that either body may be used at will, with one pair of eye-pieces £5 5 0

When two bodies are supplied they are both planed together so that they may exactly correspond; it is, however, advisable to have centreing movements to the Stage so that the Stage may rotate quite concentrically with either body.

*Van Heurck Microscope, mounted on Tripod form of Foot, with Binocular body instead of the Monocular. Fitted with rackwork draw tubes to adjust to width of user's eyes, with one pair of eye-pieces £20 10 0

*The length of the body of this Instrument is about 9 inches, the draw tubes racking out to 10 inches.

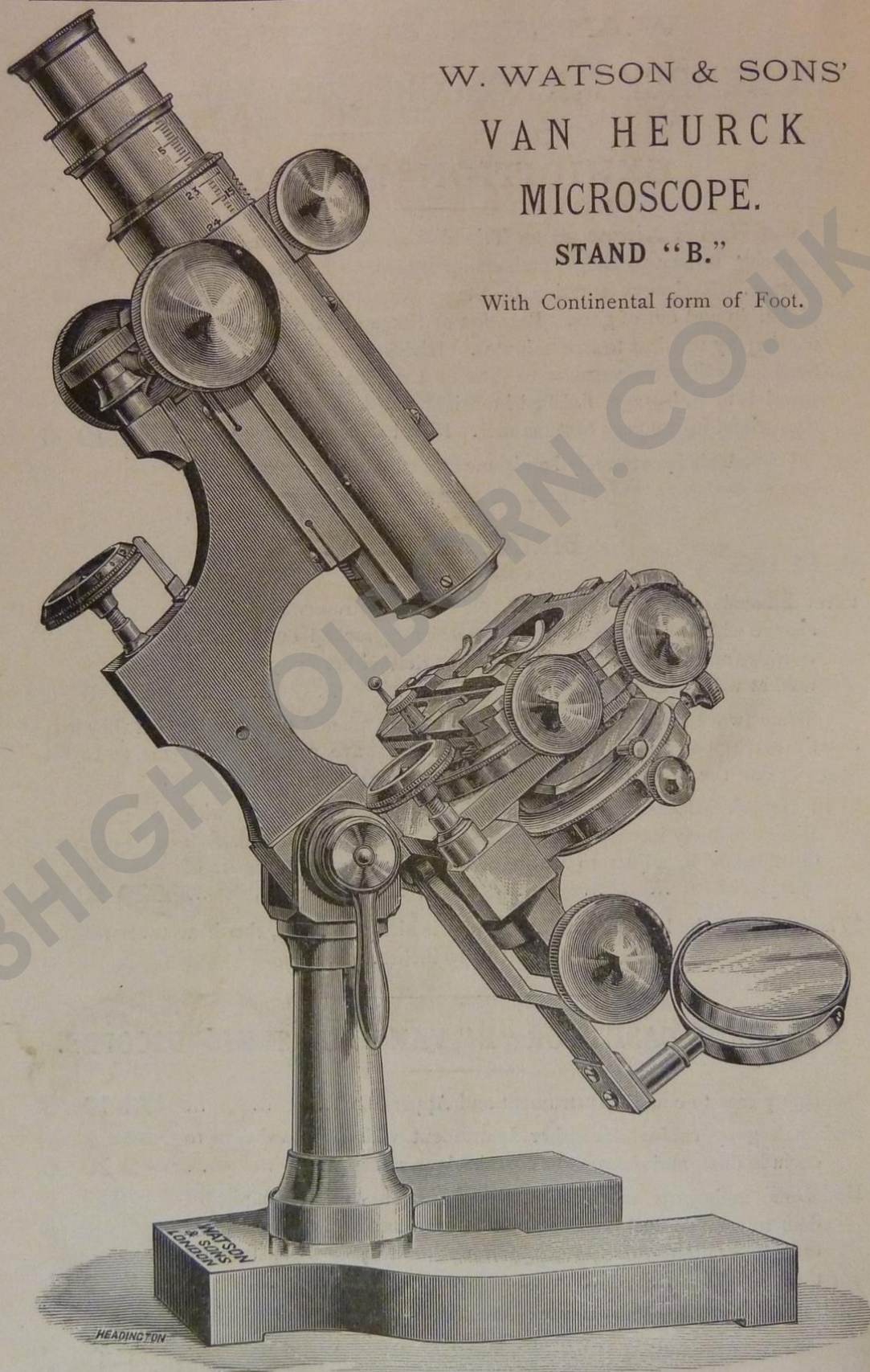
MAHOGANY CASES FOR "B" VAN HEURCK MICROSCOPES.

Mahogany case to contain Instrument and Apparatus £1 10 0
 Best mahogany cabinet for either Instrument with cupboard door to exclude dust, and drawers to contain Apparatus 2 10 0
 Handsome mahogany cabinet for either Instrument with cupboard door to exclude dust, and having fitted inside a best mahogany flat case to contain variety of apparatus; of very best construction throughout 5 0 0
 *Bell Glass Cover for Van Heurck Microscope, on polished ebonised base 0 10 6

*As this has to be packed separately, the expense of so doing will be charged at cost, and the risk of breakage in transit must be borne by the purchaser.

W. WATSON & SONS'
VAN HEURCK
MICROSCOPE.
STAND "B."

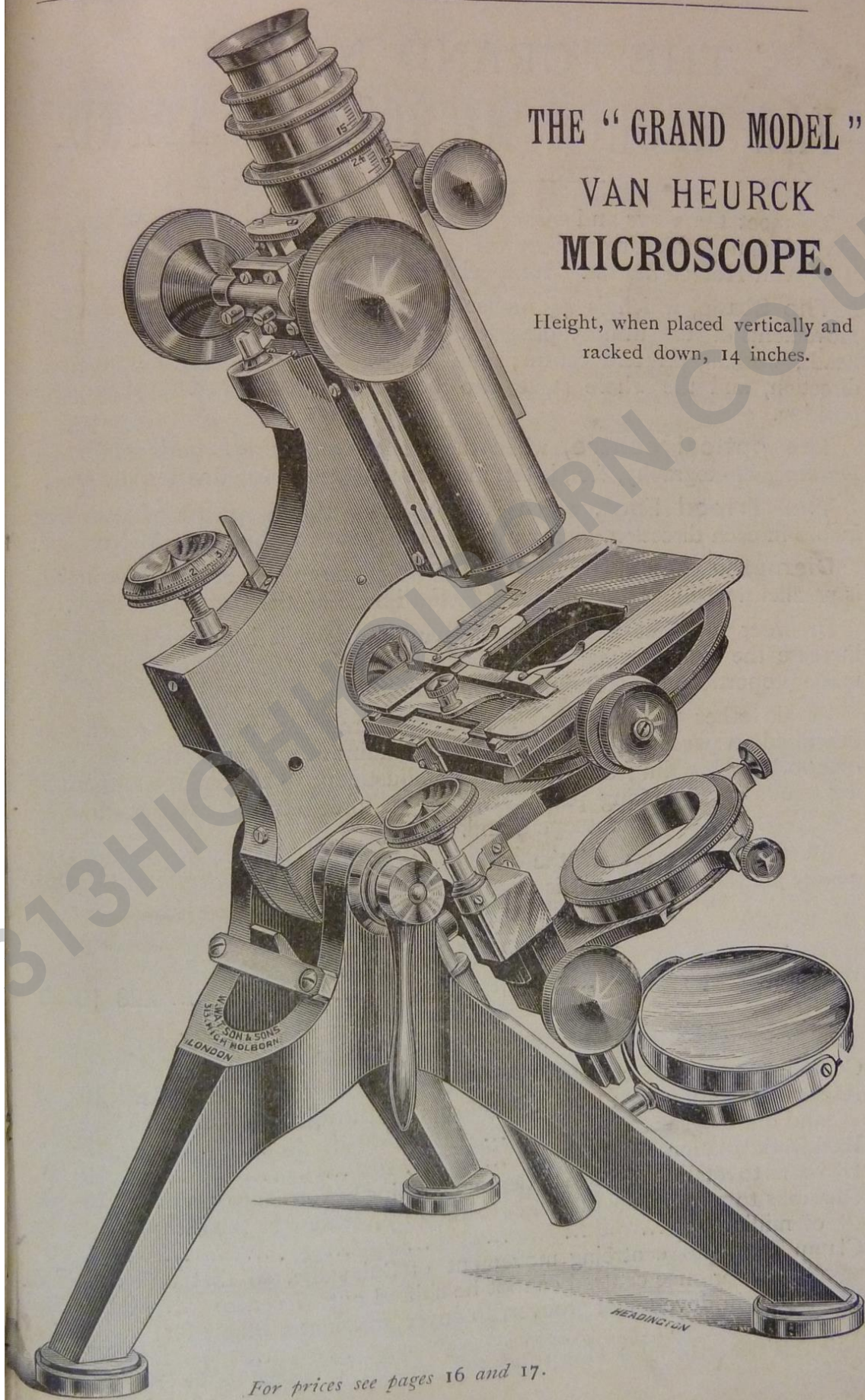
With Continental form of Foot.



Height, when placed vertically and racked down, $13\frac{1}{8}$ inches.
For description see pages 8-10 ; prices pages 12 and 13.

THE "GRAND MODEL"
VAN HEURCK
MICROSCOPE.

Height, when placed vertically and
racked down, 14 inches.



For prices see pages 16 and 17.

THE "GRAND MODEL" VAN HEURCK MICROSCOPE STAND.

To meet the views and wishes of a select class of advanced workers, we have designed this Instrument on exactly similar structural lines to the "B" Van Heurck Stands. Its special features are:—

The Stage, which is $4\frac{5}{8}$ inches diameter, has rectangular mechanical movements of the utmost precision, controlled by two stationary milled-heads, working on one centre; one inch of motion is afforded in either direction, and the whole stage can be **completely rotated** in any position.

The optical centre, when the Instrument is set horizontally for Drawing, Photography, &c., is ten inches high—the normal vision distance.

The Tripod Foot, which is cork shod, has a spread of over ten inches in each direction, giving extreme steadiness to the whole Microscope.

Diameter of Mirrors, $2\frac{3}{4}$ in. The plane mirror of this Instrument is parallel worked, and gives one reflected image of the lamp-flame only.

In order to effect the alterations named above it became necessary to increase the size over that of the "B" Van Heurck Stand, and it has been made proportionately more massive in all parts.

In all other respects the mechanical arrangements are exactly as described on pages 8 to 10. The coarse and fine adjustments, the body with rackwork and sliding draw-tubes, fine adjustment to sub-stage, compensating screws to all working parts, &c., &c., are precisely the same as in our "B" Van Heurck Microscope Stand.

All the fittings are of the universal size, and the workmanship and quality are the very finest it is possible to produce.

PRICE.

With one Eye-piece £28 10 0

EXTRAS.

Centreing Screws to Stage, & Clamp Screws to fix Stage when centred £2 10 0

Rackwork rotation to Stage, with means of throwing pinion in and out of gear 1 10 0

Rackwork rotation to Sub-stage 1 10 0

Divisions to rotation of Stage to degrees, reading by vernier to 5 mins. 0 15 0

Divisions to movements of Stage, reading by verniers to the $\frac{1}{16}$ th of millimetre 1 1 0

*Clamp Screw to centreing movement of Sub-stage, so that a Condenser once centred cannot be shifted out of centre ... 0 2 6

Plate to fit in dove-tailed grooves, to cover surface of Stage, for rough work 0 17 6

*This cannot be fitted when a rackwork rotation is supplied to the Sub-stage.

WATSON & SONS'

"GRAND MODEL" VAN HEURCK MICROSCOPE STAND.—*cont.*

PRESENTATION FORM.

"Grand Model" Van Heurck Microscope, on Tripod form of Foot, fitted with centreing screws to Stage, and clamp screws to fix Stage when centred. Rackwork rotation to stage, with means of throwing pinion in and out of gear. Rotation of Stage divided to degrees, reading by verniers to five minutes. Divisions to movements of Stage, reading by verniers to 1/10th of a millimetre. Rackwork rotation to Sub-stage, finished in **bright polished lacquered brass throughout** in the very best manner. Fitted with one Eye-piece £48 10 0

This is extremely handsome and suitable for presentation.

BINOCULAR BODY.

Extra Binocular body to the above Instrument to interchange with the Monocular, the latter being racked out from its bearings and the former replacing it, so that either body may be used at will, with one pair of Eye-pieces... .. 5 5 0

When two bodies are supplied they are both planed together so that they may exactly correspond; it is, however, advisable to have centreing movements to the Stage so that the Stage may rotate quite concentrically with either body. (See "Extras," page 16.)

*"Grand Model" Van Heurck Microscope, mounted on Tripod form of Foot, with Binocular body instead of the Monocular. Fitted with rackwork draw-tubes to adjust to width of user's eyes, with one pair of Eye-pieces... .. £30 10 0

*The length of the body of this Instrument is about 9 inches, the draw-tubes racking out to 10 inches.

MAHOGANY CABINETS, &c., FOR "GRAND MODEL," VAN HEURCK MICROSCOPE.

Mahogany Cabinet to contain Instrument and Apparatus £2 0 0
Best Mahogany Cabinet with cupboard door to exclude dust,
and drawers to contain apparatus 3 0 0
Handsome Mahogany Cabinet with cupboard door to exclude
dust, and having fitted inside a best Mahogany flat Case to
contain variety of Apparatus, of very best construction 5 5 0
*Bell Glass cover for Van Heurck Microscope, on polished
ebonised base 0 14 6

*As this has to be packed separately, the expense of so doing will be charged at cost, and the risk of breakage in transit must be borne by the purchaser.

Extract from a letter received from Dr. H. Van Heurck, 26th March, 1891:—

"I have finished the inspection of the Instrument and am very grateful to you for the beautiful Microscope you have made for me. It is a marvel of ingenuity. I send enclosed copy of a description of it I am putting into my book. It is a description, not an advertisement, and a sincere expression of the true reality."

The following are Extracts from a Description of this Microscope in the 4th Edition of "Traite du Microscope," by Dr. Van Heurck.

"In this Microscope, which Messrs. W. WATSON & SONS have kindly constructed on our suggestions, we have tried to combine all the comfort for every-day work, as well as the greatest precision possible, for a relatively low price. Messrs. W. WATSON & SONS have admirably understood all our requirements, and the Microscope they have turned out may be really considered a perfect Instrument, realising in several points a degree of perfection which had never been previously attained.

"The Foot of the Instrument is of the horse-shoe shape, bronzed, and has at the toes, near the edges, three holes, fitted with pieces of cork projecting slightly. The object of these pieces of cork is to prevent all vibration being communicated by the table on which the Instrument stands, also the slipping of the Instrument and the scratches which the sharp angles of the foot would occasion on a polished table.

"A short brass pillar, with a joint at the top to allow the Instrument to be inclined, supports the whole Microscope. A clamping screw permits of the Instrument being fixed at any desired inclination, but it is so well balanced as to render this almost unnecessary. * * *

"The Stage turns on its own axis. Instead of small gliding plates to keep the rotating circle to its bearings, there are plates with double springs. The result is that a very soft rotation is obtained, and at the same time a perfect rigidity in any position, this also without using a cog-wheel, which generally gives little jerks after it has been used some time. * * *

"The Fine Adjustment is of extreme delicacy, and of precision surpassing that of all the Microscopes in our collection. Each turn of the milled-head corresponds to $\frac{1}{100}$ th of a millimetre, and the adjustment is so perfect that it is sensible to the $\frac{1}{100}$ th of a turn, that is $\frac{1}{10000}$ th of a millimetre. * * *

"Now comes the Sub-stage, which we on purpose kept for the last, having in this part to point out improvements which have never existed in any other Microscope. The Condenser can, of course, be centred, and can be raised or lowered by means of the rack and pinion, but in addition, it is fitted with a Fine Adjustment of great delicacy, allowing of the perfect adjustment of the Condenser (an adjustment so necessary in many cases, and not yet sufficiently appreciated). In the few other Instruments to which this has been previously fitted it has been carried out by means of a single screw, which gives a coarse movement, and a loss of time in the change of direction. Here, the Fine Adjustment is working with a lever as in the Fine Adjustment of the body, and the milled-head of this adjustment comes above the Stage and quite close to that of the Body Fine Adjustment. One can therefore obtain a great precision, and work the two Fine Adjustments simultaneously with one hand. * * *

"In fact, we have had put into this Instrument all the improvements suggested by many years of work with the Microscope, and Messrs. W. WATSON & SONS have realised all our desiderata with a care and precision which was quite beyond our expectations. We would also add that this perfect Instrument costs less than the large Continental stands, and it will be admitted, that the makers in introducing this model, have filled a real want to the serious worker."

Extract from the "English Mechanic," 8th May, 1891:—

"Making every allowance for the praise which the designer would naturally award to his own device when carried out in the most perfect manner possible, we will only say, that if a better Microscope is in existence we should like to see it."

The following are Extracts from Letters, &c., received concerning the Van Heurck Microscope:—

From L. Gife, Esq., Member of the Jury of the International Exhibition of Microscopes, Antwerp, 1891: "It is now a month since I received the Van Heurck Microscope, and during that time this charming Instrument has made me pass delightful hours. In spite of all the tests to which I have submitted it there is no fault to be found in it. After using several Microscopes of Continental manufacture, I bought some years ago an Instrument by * * * (a noted maker). This Instrument had been of great usefulness to me, until I had my first Apochromatic Objective. For these, neither the fineness of the slow movement nor the rigidity of the different parts were good enough. A simple examination was still possible, but Photography presented insurmountable difficulties. For some time my focussing screen did not carry the image of a single specimen, but since I have had your Instrument all is changed, and a new ardour has taken the place of desperation, and without describing the special details of the Instrument I must say that the description which W. WATSON & SONS give in their Catalogue of the Van Heurck Microscope is true, and that the Instrument answers fully to all that these able opticians promise. I will only mention one point—the different movements. The Slow Movement is of an incomparable precision, and of a slowness which would be excessive if the rapid movement were not so well constructed, which alone permits a very approximate adjustment before it is necessary to use the Slow Movement. At first I thought that the Differential Screw Movement of * * * would be useful, but being now intimate with my New Instrument I recognise its inutility. The movement of the carrier and the Stage are also admirable. * * * Finally I would mention one more point. I was photographing the Bacillus of Tuberculosis some days since. When I had made the exposure, I left the apparatus in its place and developed the plate. Having done this I was surprised to remark that the Image was still on the Focussing Screen and as sharp as it was before the exposure. Half-an-hour's shaking by passing vehicles, &c., had not affected it. This is, I think, the best testimonial to the excellence of the Instrument."

From C. H. Evans, Esq., M.D., Canton, Ohio, U.S.A.:—"After critical examination of the Microscope (Stand "B," Van Heurck) I am pleased to say its performance is entirely satisfactory in every respect. To say that I am proud of it does not express my appreciation of the beautiful Instrument. All the racks and pinions work smoothly, without a particle of lost motion; the draw-tubes work perfectly true to the optic axis without any lateral movement, with a $\frac{1}{16}$ in. Objective. The Fine Adjustments to Stage and Sub-stage leave nothing to be desired. The Stand itself is extremely steady and free from tremor; in fact, the whole Instrument is superb."

From Wynne E. Baxter, Esq., J.P., D.L., F.R.M.S., Coroner to S.E. Middlesex, etc., 170, Church St., N.: "You will be pleased to hear that the Van Heurck Microscope with which you supplied me, is doing its work with great exactness. The Fine Adjustment works very smoothly and with the greatest precision. I also find the advantage which the Van Heurck Camera (see page 81) affords of allowing the focussing arrangement to be carried out without disturbing the optical and illuminating parts, of great practical utility."

From Mons. F. Vingerhoets, 50, Avenue des Arts, Antwerp: "I have much pleasure in informing you that the Van Heurck Microscope which I purchased gives me every satisfaction. The precision of all the movements, the facility of using the Instrument, and the perfect finish of the work in all parts, makes it a Microscope of the highest rank and strongly to be recommended. I think it is impossible to find an Instrument at once more perfect and more elegant."

From the Rev. W. E. Hancock, M.A., The Vicarage, Knaresborough: "I have received the Van Heurck Stand, and have gone very carefully through the Instrument and am much pleased with it. All the adjustments seem as good as they can possibly be. With the Fine Adjustment I am especially pleased."

From J. Hart, Esq., 119, Paisley Road, Glasgow: "I have now tested and examined the Microscope ('B' Van Heurck) and find it a very good Instrument, and in every way worthy of the high praise it has received in other quarters."

From D. Miquel, Esq., Chef du Service Micrographie Observatoire Municipal, Paris: "I received the Van Heurck Microscope ('B' Tripod), ordered for the Department, with which I am very satisfied and have pleasure in ordering a second one for my personal use as follows:—

From Dr. James Rae, 3, Drummond Place, Stirling, N.B.: "The Microscope (Binocular Van Heurck with high power prism) was received in good condition. All the movements work smoothly and correctly, and both prisms act well. Thanking you for the nice Stand with which you have supplied me."

From Dr. Henry G. Piffard, 10, West 35th Street, New York: "I have gotten everything ('B' Tripod Van Heurck Microscope and Apparatus) now arranged to my satisfaction, and only wonder how you can turn out so admirable a piece of work at the very reasonable price you ask for it. I have been a worker with the Microscope for thirty years, and in Photo-Micrography for nearly twenty, and hence am reasonably familiar with the requirements for the successful prosecution of these studies."

Extract from the Science of Photo-Micrography, by Dr. E. C. Bousfield:

"The Van Heurck Microscope of WATSON & SONS (manufactured by them from a specification by the distinguished microscopist and photo-micrographer, whose name they have attached to the stand, and regularly used by him), is a high-class Instrument of excellent workmanship and reasonable price, and will be found adequate to the requirements of its possessor, whatever they may be."

Dr. F. O. Broady, President, Physio-Medical College, Chicago, Ill., U.S.A., March 31st, 1894: "The Microscopes that our college ordered from you last fall have, after a college term of hard usage, proved themselves to be of most excellent construction in all the respects that go toward making up a desirable Laboratory Instrument. I am speaking now of the three Edinburgh Student's 'B' Stands. The Van Heurck Stand is of the most satisfactory kind. And again on October 1st, 1894: "My Van Heurck Stand is of the kind that produces envy in the citizens of this State, who know a good thing when they see it."

From J. S. Byers, Esq., Stockton-on-Tees, 1st July, 1892: "Referring to the Van Heurck Microscope. Speaking from my experience of it, I do not think that it has a superior by any maker, and in some respects it has advantages possessed by none that I have seen or heard of. Apart from the excellence of the adjustments, one immense advantage is the wide range of tube length and the power of using Objectives, corrected for either the English or Continental tubes."

From Dr. Gerard Smith, Craigholm, Upper Clapton, N.E.: "I write to express my complete satisfaction with the Van Heurck Microscope which I purchased of you, both as a table Instrument for delicate work, and specially as an Instrument for Photo-Micrography. I find an entire absence of any disturbance of the image after it has once been focussed, even with high powers, there being no 'backlash' at all in the oblique racks and adjustments; the fine adjustments both of the body and sub-stage are perfectly made. I send you a lantern slide of part of a section of the eye of *Eristalis tenax*, showing the Corneal Lenses, &c. This is from a negative which I purposely took in three exposures, at intervals of fifteen minutes, in order to test the rigidity of the Instrument. I also send a lantern slide of the whole eye."

See also Extract from Report of Jury of International Exhibition of Microscopes, Antwerp, 1891, page 7; and Extract from the Royal Microscopical Society's Journal, page 5.

We have had the honor of supplying our "Van Heurck" Microscope to the following well-known Microscopists and Institutions, among many others:

- ANDREW PRINGLE, Esq., F.R.M.S., Author of "Practical Photo-Micrography, &c., &c."
- DR. C. PICTET, Stazione Zoologica, Naples.
- DR. GERARD SMITH, Upper Clapton.
- DR. R. H. CUNNINGHAM, New York.
- DR. SURVEYOR, Grant College, Bombay.
- F. U. P. GILL, Esq., Nellikuppen, S. Arcot, Madras Presidency.
- F. W. MILLS, Esq., F.R.M.S., Author of "Photography applied to the Microscope, &c., &c."
- DR. J. H. WYTHE, Professor of Microscopy and Histology, Cooper Medical Colleges, San Francisco.
- C. DE CANDOLLE, Esq., Versoix, near Geneva.
- F. J. LLOYD, Esq., F.C.S., F.I.C.
- N. B. H. DEAN, Esq., M.D., Brighton, Ontario.
- E. K. GREEN, Esq., Cape Town.
- G. E. DAVIES, Esq., Author of "Practical Microscopy."
- PROF. BARRETT, Queen's College, Belfast.
- PROF. J. B. HARRISON, Government Laboratory, B. Guiana.
- P. E. RADLEY, Esq., Ceylon.
- DR. J. C. GRAHAM, Starling Medical College, Columbus, Ohio
- DR. H. M. EARLY, Columbus, Ohio.
- PROF. O'NEILL, Chemical Dept., State University, California
- DR. A. ANGELL, County Laboratory, Southampton.
- DR. A. H. MACBETH, Buffalo, N.Y.
- PROF. C. MOREL, Laboratoire d'Anatomie Pathologique de la Faculté de Medicin, Toulouse.
- DR. G. JOHNSTONE STONEY, D.Sc., M.A., F.R.S.
- DR. OZZARD, Georgetown, Demerara.
- C. H. POTTER, Esq., The Lennox, Cleveland, Ohio.
- UNIVERSITY OF KANSAS, Lawrence, Kan., U.S.A.
- THE UNIVERSITY COLLEGE, LIVERPOOL, per Prof. R. Boyce.
- DR. C. H. EVANS, Canton, Ohio.
- A. S. KAPADIA, Esq., Government of H.H. the Sultan, Public Works Dept., Zanzibar.
- PROF. STEFANO CAPRANICA, Royal University of Genoa.
- DR. J. LEON WILLIAMS, D.D.S., L.D.S., &c.
- CROWN AGENTS FOR THE COLONIES.
- DR. J. G. SPENZER, Cleveland, Ohio.
- C. T. WILLIAMS, Esq., Secretary of the Microscopical Society, Montreal
- J. F. STONE, Esq., Columbus, Ohio.
- PROF. JOSEPH BEMROSE, McGill College, Montreal.
- J. H. OSMOND, Esq., Manila.
- THE CITY OF ANTWERP LABORATORY.
&c., &c.

COMPLETE RESEARCH OUTFIT "L."

"Grand Model," Van Heurck Microscope Stand, as figured page 15 of catalogue, with one Huyghenian Eye-piece, B	£28 10 0
Divisions to Stage reading to $\frac{1}{10}$ th millimetre	1 1 0
Divisions Rotation of Stage reading to 5 minutes	0 15 0
Rackwork Rotation to Stage £1 10s. and Sub-stage £1 10s.	3 0 0
Centreing Screws to Stage	2 10 0
Plate to cover Stage for rough work	0 17 6
	£36 13 6
Best Mahogany Cabinet to contain Instrument and Apparatus	5 5 0

APOCHROMATIC OBJECTIVES BY ZEISS, &c.—

For Projection without Eye-piece 70 m/m. £2, 35 m/m. £1 15s.	£3 15 0
24 m/m. £6. 12 m/m. £7. 6 m/m. £9	22 0 0
Oil Immersion 3 m/m. (1'4 N.A.) £20, 2 m/m. (1'3 N.A.) £15	35 0 0
Best Quality zin. £1 10s., 3in. £1 10s., by WATSON & SONS	3 0 0
	63 15 0

COMPENSATING EYE-PIECES BY ZEISS, &c.—

Power 4 8 12 18 27	
Price £1 5s. £1 15s. £1 10s. £1 10s. £1 5s.	7 5 0
Huyghenian Eye-pieces by WATSON & SONS, "C" $\frac{11}{16}$ "D" $\frac{16}{16}$...	1 8 0
	8 13 0

ACCESSORY APPARATUS—

Parachromatic Condenser with Iris Diaphragm and Set of Stops, as described page 77, No. 133	3 15 0
Achromatic Condenser (1'0 N.A.) with Iris Diaphragm and Set of Stops, Nos. 129, 130 (page 76)	3 12 6
*Powell and Lealand's Apochromatic Oil Immersion Condenser (1'4 N.A.) to interchange in Parachromatic Condenser Fitting above (page 77)	9 0 0
Polariser of specially large size with divided Circle, arranged to work with the above Condensers, Analyser to fit over Eye-piece with divided Circle, and Calcspars	3 15 0
Set of Selenites for Sub-stage, No. 151	3 3 0
Gifford's Light Screen 4/6, Tinted Glasses for Condensers 5/0...	0 9 6
Stand Condenser, No. 177 (page 80)	0 15 0
Ramsden Screw Micrometer in Aluminium, No. 201 (page 83)	3 15 0
Stage Micrometer 5/0, Improved Rousselet's Compressor, No. 223 15/0	1 0 0
Triple Nose-piece, Aluminium £1 12s. 6d., 2 Live Boxes @ 10/6 = £1 18s.	2 13 6
Abbe Pattern Camera Lucida in Aluminium, No. 181	2 0 0
Micro-Spectroscope (see page 69)	6 10 0
Microscope Lamp, No. 254, £1 5s., Mahogany Case 7/6	1 12 6
Set of 12 Test Objects in Case (see Object Catalogue)	1 1 0

APPARATUS FOR MOUNTING—

Laboratory Dissecting Microscope with set of three Aplanatic Magnifiers (see page 69)	4 5 6
Dissecting Troughs	0 10 0
Set of Dissecting Instruments (No. 285)	1 5 0
Cabinet (Mahogany) of Mounting Apparatus (see page 90)	2 15 0
Cathcart Microtome for Embedding and Freezing (see page 88)	1 1 0
Cole's Section Cutter with Punches (see page 89)	1 10 0
Plane Iron 2/6, Section Knife 4/6	0 7 0

PHOTO-MICRO. APPARATUS—

Laboratory Camera (see page 98)	£10 10 0
2 Inner Frames	0 3 6
Fitting Microscope to Camera, supplying Connecting Flanges, &c.	0 16 6
	11 10 0
Projection Eye-pieces, 2 and 4 @ £2 (see page 70)	4 0 0
Focussing Glass	0 10 6
Aplanatic Bull's Eye Condenser (see page 80) with centreing Screws and Iris Diaphragm	4 5 0
Brass-mounted Trough on Stand, to contain Light and Heat Absorbing Media	1 0 0
Set of Chemicals for Development, as per page 99	2 10 0
	£192 17 6

All necessaries for Photo-Micrography with Oil Light are included above.
If Oxy-Hydrogen Light is desired the first five items in Set No. 1 (page 100) must be added

12 12 6
£205 10 0

* The Abbe Illuminator (1'4 N.A.) can be substituted for this if desired, to interchange in the Achromatic Condenser Fitting. The price is £1 5s.

COMPLETE RESEARCH OUTFIT "M."

"B" Van Heurck Microscope Stand, on Tripod foot, as per page 11, with 1 Eye-piece				£18 10 0
Divisions to Stage, reading to $\frac{1}{10}$ th millimetre	...	...	...	...
Best Mahogany Case to contain Instrument and Apparatus	...	...	...	£1 1 0
Clamp Screw to centreing movement of Sub-stage	...	...	...	2 10 0
Plate to cover Stage for rough work	...	...	...	0 2 6
Dividing Rotation of Stage	...	...	...	0 17 6
	...	...	...	0 15 0

*OBJECTIVES (see page 60), best quality—				5 6 0
2in. £1 10s., 1in. £1 10s., $\frac{1}{2}$ in. £3 15s., $\frac{1}{8}$ th £5 5s.	£12 0 0
$\frac{1}{12}$ in., Homogeneous Immersion	5 0 0

EYE-PIECES—				17 0 0
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"B" "C" "D" "E" & "F"
11/6 11/6 16/6 16/6 16/6
									3 12 6

ACCESSORY APPARATUS—

Achromatic Condenser (1.0 N.A.), with Iris Diaphragm and set of Stops for dark ground and oblique illumination (see page 76)
Abbe Model Illuminator, Optical part (1.4 N.A.), to go in above fitting (No. 128)	...	...	...	...	...	...	...	...	...
Ramsden Screw Micrometer Eye-piece £3 15s. Stage Micrometer 5/0	...	...	...	...	...	...	...	...	...
Polariser of specially large size, with divided Circle, arranged to work with the above Condenser, Analyser to fit over Eye-piece with divided Circle, and Calcspar	...	...	...	...	...	...	...	...	...
Micro-Spectroscope (see page 69)	...	...	...	...	...	...	...	...	...
Double Nose-piece 15/0, 2 Live Boxes at 10/6 (see page 84) £1 1s.	...	...	...	...	...	...	...	...	...
Microscope Lamp (No. 254, page 72) £1 5s., Mahogany Case 7/6	...	...	...	...	...	...	...	...	...
Aplanatic Bull's Eye Stand Condenser (see page 80)	...	...	...	...	...	...	...	...	...
Set of 12 Test Objects (see Object Catalogue)	...	...	...	...	...	...	...	...	...
Abbe Pattern Camera Lucida in Aluminium	...	...	...	...	...	...	...	...	...

APPARATUS FOR MOUNTING—

Cabinet of Mounting Apparatus, Pine (see page 90)	...	...	...	...	...	...	...	...	...
Laboratory Dissecting Microscope with set of three Aplanatic Magnifiers (see page 69)	...	...	...	...	...	...	...	...	...
Dissecting Troughs	...	...	...	...	...	...	...	...	...
Set of Dissecting Instruments	...	...	...	...	...	...	...	...	...
Cathcart Microtome for Imbedding and Freezing (see page 88)	...	...	...	...	...	...	...	...	...
Plane Iron 2/6, Section Knife 4/6	...	...	...	...	...	...	...	...	...

PHOTO-MICRO. APPARATUS—

Laboratory Camera (see page 98)	...	...	...	...	...	...	...	...	...
2 Inner Frames 3/6, fitting Microscope and supplying Connecting Flanges, 16/6...	...	...	...	...	...	...	...	...	...
									£10 10 0
Focussing Glass 10/6, Projection Eye-piece £2	...	...	...	...	...	...	...	...	...
Brass-mounted Trough on Stand, to contain Light and Heat	...	...	...	...	...	...	...	...	...
Absorbing Media	...	...	...	...	...	...	...	...	...
Chemicals for Development, &c., in case (see page 99)	...	...	...	...	...	...	...	...	...
All necessaries for Photo-Micrography with Oil Light are included above.	...	...	...	...	...	...	...	...	...
If Oxy-Hydrogen Light is desired, add the first five items of Set No. 1, page 100, to the above	...	...	...	...	...	...	...	...	...

£110 9 6

* Apochromatic Objectives and Compensating Eye-pieces, as per page 73, may be substituted for above if desired.

We have had the honour of supplying our Edinburgh Student's Microscopes (see succeeding pages) to the following well-known Microscopists, Colleges, &c., among many others.

F. W. MILLS, Esq., F.R.M.S., Author of "Photography Applied to the Microscope,"
 E. J. BEVAN, Esq., Analyst to the County of Middlesex. [&c.
 E. M. NELSON, Esq., F.R.M.S., President of the Quekett Microscopical Club, and
 Vice-President of the Royal Microscopical Society.
 M. J. MICHAEL, Esq., Davos Platz.
 PROF. G. D. LIVEING, Cambridge.
 ANDREW PRINGLE, Esq., F.R.M.S., Author of "Practical Photo-Micrography," &c.
 J. WILLIAMS, Esq., Government Laboratory, Georgetown, Demerara.
 THE PHYSIO-MEDICAL COLLEGE, Chicago, U.S.A., per Dr. F. O. Broady.
 A. LETHERBY, Esq., of Johannesburg.
 E. B. STRINGER, Esq., Bromley, S.E.
 G. WISHART, Esq., Port Elizabeth, S. Africa.
 DR. R. P. MITCHELL, Barberton, Transvaal, S. Africa.
 S. E. TAYLOR, Esq., San Francisco.
 ALVEY A. ADEE, Esq., Washington D.C., U.S.A.
 IMPERIAL INSTITUTE LABORATORY.
 DR. JOHN FR. HOLM, University of Stockholm.
 CROWN AGENTS FOR COLONIES.
 WESTMORELAND COUNTY COUNCIL.
 CHESHIRE COUNTY COUNCIL.
 JOSÉ COTORRUELO, Esq., Carthagena, Spain.
 THE COOPER MEDICAL COLLEGE, San Francisco, Cal., U.S.A., per Prof. J. H.
 Wythe (20 "F" Instruments).
 SURGEON-MAJOR D. BASU, Batheen, India.
 DR. J. A. LESTRADE, Government Medical Officer, Vieuxfort, St. Lucia, W. Indies.
 PEOPLE'S PALACE, Mile End, E.
 GUY'S HOSPITAL LABORATORY.
 &c., &c.

W. WATSON & SONS'

Improved High-Power Binocular Prisms.

THE continued demand for a Binocular Microscope to work with any powers in a satisfactory manner has caused us to manufacture Prisms for this purpose. Hitherto the $\frac{1}{2}$ -in. Objective has been the highest power with which the Binocular Microscope with the ordinary Prism could be worked; for higher Powers than this the Prism has had to be withdrawn, and the Monocular body only used. With our Improved Prisms the highest powers can be worked with comfort. The Binocular tube is not so brilliantly illuminated as the Monocular, but the contrast is not noticeable when the two tubes are in use binocularly, and the definition in the left-hand tube does not suffer materially.

PRICES.

- No. 1.—Improved High-power Prism, non-stereoscopic, supplied with any full-size Binocular Instrument quoted in this Catalogue extra charge **£3 15 0**
 No. 2.—Stereoscopic High-power Prism, supplied with any Binocular Instrument quoted in this Catalogue ... extra charge **£6 6 0**

When either of the above is ordered with one of our new Instruments, the ordinary Binocular Prism is also supplied to go in the same fitting, so that the stereoscopic effect may be obtained with the low powers as usual.

Either of the above will work with a $\frac{1}{16}$ th in. Oil Immersion Objective.

These Prisms cannot be adapted to existing Binocular Microscopes without incurring a rather heavy extra cost. We shall, however, always be pleased to quote for fitting them.

THE EDINBURGH STUDENT'S MICROSCOPE.

WHEN introducing this Microscope a few years since, we stated that we believed it to be the most convenient yet designed for Students' purposes. This statement has been more than confirmed by the enormous demand for it, not only from leading Medical Schools, Universities and Colleges in Great Britain, but also from Universities in America, the Colonies of Australia and India, and on the Continent from France, Germany, Spain, Belgium, Hungary, &c. Wherever it has been introduced it has at once found favour, and we believe no Microscope is now used more largely by Professors, Scientists, Analysts, Brewers, and Amateurs, than the Edinburgh Student's Instrument.

The series embraces Microscopes of plain construction, suitable for Students' and Laboratory use, and those having every mechanical convenience that modern research demands, eminently fulfilling the requirements of the Professor and the advanced worker. The whole of these Instruments are specially constructed to withstand hard usage. The very greatest care is bestowed on every detail of their manufacture, and it is impossible to turn out Instruments of finer workmanship. Every improvement that experience can suggest has been added to render them absolutely perfect, and as high-class working Microscopes they are unequalled, while the prices are far lower than those at which such high quality Instruments have ever previously been offered, the large number we manufacture and the conveniences we have for their production, enabling us to make them very economically.

The Instrument was originally designed by DR. ALEXANDER EDINGTON, late Lecturer on Bacteriology at Edinburgh University, specially for Bacteriological investigation; but in it Amateurs and Students in every department of Microscopical research will find an Instrument capable of doing the most delicate work, and we can most confidently recommend it to them.

The **Continental or Horse-shoe Pattern form of Foot** as originally made by us for this Microscope is exceedingly popular, and is invariably preferred by and recommended to students, as, owing to its compactness, the Instrument is rendered extremely portable, but it is not so perfectly rigid in all positions to which the Instrument may be inclined for working (especially if the table on which it is placed has inequalities of surface) as the **Tripod form of Foot**. This latter is strongly recommended by eminent microscopists, including Messrs. E. M. Nelson, Andrew Pringle (to both of whom we have had the pleasure of supplying Tripod Edinburgh Student's Microscopes), and Dr. W. H. Dallinger. It undoubtedly imparts the maximum of rigidity, and has a very commanding appearance. We were the first to adapt this ideal form of foot, to a comparatively low-priced Instrument, and appreciation of it has been manifested by the many orders we have received. All the qualities which have made this Microscope so popular and esteemed on the Horse-shoe form of foot are retained identically when the Tripod foot is used.

Another feature of recent introduction is a **Rackwork Draw-tube** with a second draw-tube sliding inside it, of new construction and as exhibited and described by Mr. E. M. Nelson, at the meeting of the Royal Microscopical Society held February 15th, 1893 (*vide* R. M. Society's Journal, page 239). It is figured on

THE EDINBURGH STUDENT'S MICROSCOPE—continued.

page 40, and its advantages are described in connection with the Van Heurck Microscope, page 9. With the two draw-tubes closed, the length of the body is 6 inches, when both are extended, 12 inches. This new form of rackwork draw-tube can only be supplied where the regular diameter of body is taken, it not being suitable for larger sizes. This accessory will render the Instrument more than ever complete for high-class work.

We have also arranged that as far as practicable in an Instrument of such necessarily precise construction as a Microscope, parts shall be interchangeable: thus, the Sub-stage of the "C" or "G" Microscopes can be at once fixed to the "B" and "F" Stands by means of the screws that affix the Underfitting in the latter Stands.

A great convenience, never previously placed at the disposal of Students in a cheap form of Microscope, is to be found in our **New Centering Underfitting**, described on page 34, and we strongly recommend its adaptation to our Student's Microscopes.

The fact that DR. HENRI VAN HEURCK, the celebrated Microscopist, of Antwerp, has favoured us on separate occasions with orders for two of the "D" Stands and one of the "C" for use in his Photo-Micrographic work, and has expressed his great satisfaction with each Instrument, alone attests their fitness for the most precise and accurate observations. Writing to us on August 8th, 1890, with regard to a "D" Instrument we had just supplied to him, he says: "The Microscope is excellent, and I see with pleasure that you do your utmost to arrive at a state of perfection."

It will be noted that the Instrument is made in four forms, "A," "B," "C," and "D" on the Horse-shoe Foot, and "E," "F," "G," and "H" on the Tripod form of Foot. Each of them is perfectly efficient, and capable of the high class work, but we have constructed them with varying elaborations to meet the wants of the Amateur, Student, or Professor.

Binocular Form.—In response to repeated requests we now make the "B," "C," "D," "F," "G," and "H" Stands in Binocular form; the prices are given in connection with the different Stands. A Binocular Instrument of this pattern is exceedingly compact, portable and convenient.

LARGE SIZE BODIES.—These Instruments may also be had to order only with the body of any desired large size; no extra charge is made for this, but no eye-piece is then included with the Stand at the price quoted. The rackwork draw-tube referred to above cannot then be fitted.

The following are some of the Special features of the Instrument—

IT IS EXCEEDINGLY COMPACT, but notwithstanding this, none of the movements are at all cramped, the long clear distance between the stage and the foot giving greater convenience for the manipulation of the mirror, under-stage apparatus, &c., than is usually found in the largest Instruments.

THE FINE ADJUSTMENT is our improved form as described page 3. One revolution of the milled-head moves the body $\frac{1}{3000}$ th of an inch, and as it is sensitive to the $\frac{1}{1000}$ th of a turn, a motion of $\frac{1}{3000}$ th part of an inch can be obtained.

THE BODY carries the Continental size eye-pieces 0.92 in. diameter, and with draw-tube closed is of Continental length. The draw-tube, which is graduated to centimetres, when out to its full extent makes the length of the body 10 inches. The inside diameter of the top of the draw-tube is smaller than the remainder, the former making a fitting for the eye-piece about 1 inch long, permitting of the tube being blackened inside up to this fitting, and so minimising reflection.

THE STAGE is of extra large size, being $3\frac{1}{2}$ inches square, so allowing of the use of large slips, &c. It is mounted at the most convenient height for support to be given to the hands, when manipulating the object.

THE FITTING FOR UNDER-STAGE APPARATUS is hung on a pivot, allowing of it and the apparatus contained in it to be at once turned aside (leaving the mirror free for use) and replaced as required. (See illustration, page 34.) If desired, this may be supplied fixed.

THE EDINBURGH STUDENT'S MICROSCOPE—continued.

THE MIRRORS are plane and concave, and are mounted on a swinging arm, permitting of their being swung aside for Photography, &c., also allowing of light being thrown on the object very obliquely. They are also adjustable to focus by means of a sliding fitting.

THE FITTINGS are all of universal size.

THE EYE-PIECES have nickel-plated tubes to prevent tarnishing, and all work in the same focal plane; thus, on a low power Eye-piece being interchanged with one of higher power, the object will be practically in focus.

ALL THE MOVEMENTS are fitted with screws, which by being very slightly turned, compensate for wear and tear caused by friction. The adjustments can therefore be made by customers, and the trouble and inconvenience of having to get Instruments tightened is avoided. (See extract from *Journal de Micrographie*, page 49.)

THE OBJECTIVES are of our new "Parachromatic" series, in which the Jena glass is principally employed. They are specially adapted for Students' and general requirements and will bear favourable comparison with any form of Students' Lens either Continental or English, and being made on our own premises, under our own supervision, we are able to guarantee the performance of each one of them.

THE ABBE MODEL ILLUMINATOR (1.2 N.A.) we supply with these Microscopes is an exceedingly efficient and popular form of Sub-stage Condenser, the Lenses being mounted in Aluminium, as figured page 75. When using Objectives from a $\frac{1}{4}$ inch upwards, especially with objects requiring a strong transmitted light, the illumination obtainable from the concave mirror is insufficient. The Abbe Model Illuminator collects the light reflected by the mirror, and projects a cone of rays of very wide angle on to the object, giving a perfect brilliance of illumination even with the highest power Objectives. It is now recognised as an absolutely essential adjunct to all Microscopes with which serious work is to be done. For Photo-Micrographic work, for which the Edinburgh Student's Microscope are especially suitable, an Achromatic Condenser such as No. 129 for low powers and No. 133 for high powers, is preferable, and is recommended instead of the Abbe Illuminator, and if one be selected it may be taken at the difference in price between the Abbe Illuminator ordinarily supplied and the Condenser that is selected. The Abbe Illuminator is, however, generally preferred for visual work, and gives good results in Photo-Micrography.

SPECIAL NOTE.—It should be understood that the Stands "E," "F," "G," and "H" are exactly identical in construction with "A," "B," "C," and "D," with the exception of the Foot. The Tripod Foot cannot, however, be adapted to existing Microscopes having the Horse-shoe form of Foot.

EDINBURGH STUDENT'S AND HISTOLOGICAL MICROSCOPES.

Pages 25 to 54.

SPECIAL NOTICE.

It will be observed that the *complete* Edinburgh Student's and Histological Instruments are priced much lower than if the Stand and each piece of Apparatus were charged separately. We are able to do this because, from the large demand for them, we are satisfied with a very small profit on each individual transaction; and also the number allows us to fit them up systematically, and consequently economically. It is, therefore, to the advantage of purchasers to take the complete Instruments as quoted; full price cannot be deducted if any item is not required.

W. WATSON & SONS'

EDINBURGH

STUDENT'S MICROSCOPE.

STAND "A."



Height, when placed vertically and closed down, $11\frac{3}{8}$ inches.

For Prices, see page 29.

THE EDINBURGH STUDENT'S MICROSCOPE.

PRICE LIST.

STAND "A."

STAND A.—Microscope Stand, as figured page 28, and described on pages 25-27, with Coarse Adjustment by sliding body in perfect fitting tube, draw-tube divided to centimetres, Milled-head of Fine Adjustment grooved for attachment to Photographic Camera, fitted with one Eye-piece only (no Objectives) ... £3 10 0

Mahogany Case for ditto ... 0 10 6

The above Instrument, fitted with two Eye-pieces, Abbe Model Illuminator, with set of Stops, No. 122, page 76, highest quality 1 in., 25°, and $\frac{1}{8}$ in. Objectives, of our New "Parachromatic" Series, complete in Mahogany Case ... 7 15 0

ON TRIPOD FORM OF FOOT.

STAND "E."

STAND E.—Microscope Stand, similar to illustration, page 32, but with Coarse Adjustment by sliding body in perfect fitting tube, draw-tube divided to centimetres, Milled-head of Fine Adjustment grooved for Attachment to Photographic Camera, fitted with one Eye-piece only (no Objectives) ... 4 5 0

Mahogany Case for ditto ... 0 17 6

The above Instrument, fitted with two Eye-pieces, Abbe Model Illuminator, with set of Stops, No. 122, page 76, highest quality 1 in., 25°, and $\frac{1}{8}$ in. Objectives of our New "Parachromatic" Series, complete in Mahogany Case ... 8 17 6

This is identical with the "A" Stand on the Horse-shoe Foot.

NOTE.—If the Abbe Illuminator be not taken £1 may be deducted from the price of the above complete Instruments.

MAGNIFYING POWER of the OBJECTIVES SUPPLIED with the INSTRUMENTS.

OBJECTIVE.	EYE-PIECE.					
	"B."		"C."		"D."	
	Draw Tube closed.	Draw Tube extended.	Draw Tube closed.	Draw Tube extended.	Draw Tube closed.	Draw Tube extended.
1 in.	43	72	57	96	71	120
$\frac{1}{8}$ in.	252	402	336	536	420	670

For further list of Magnifying Powers, see page 72.

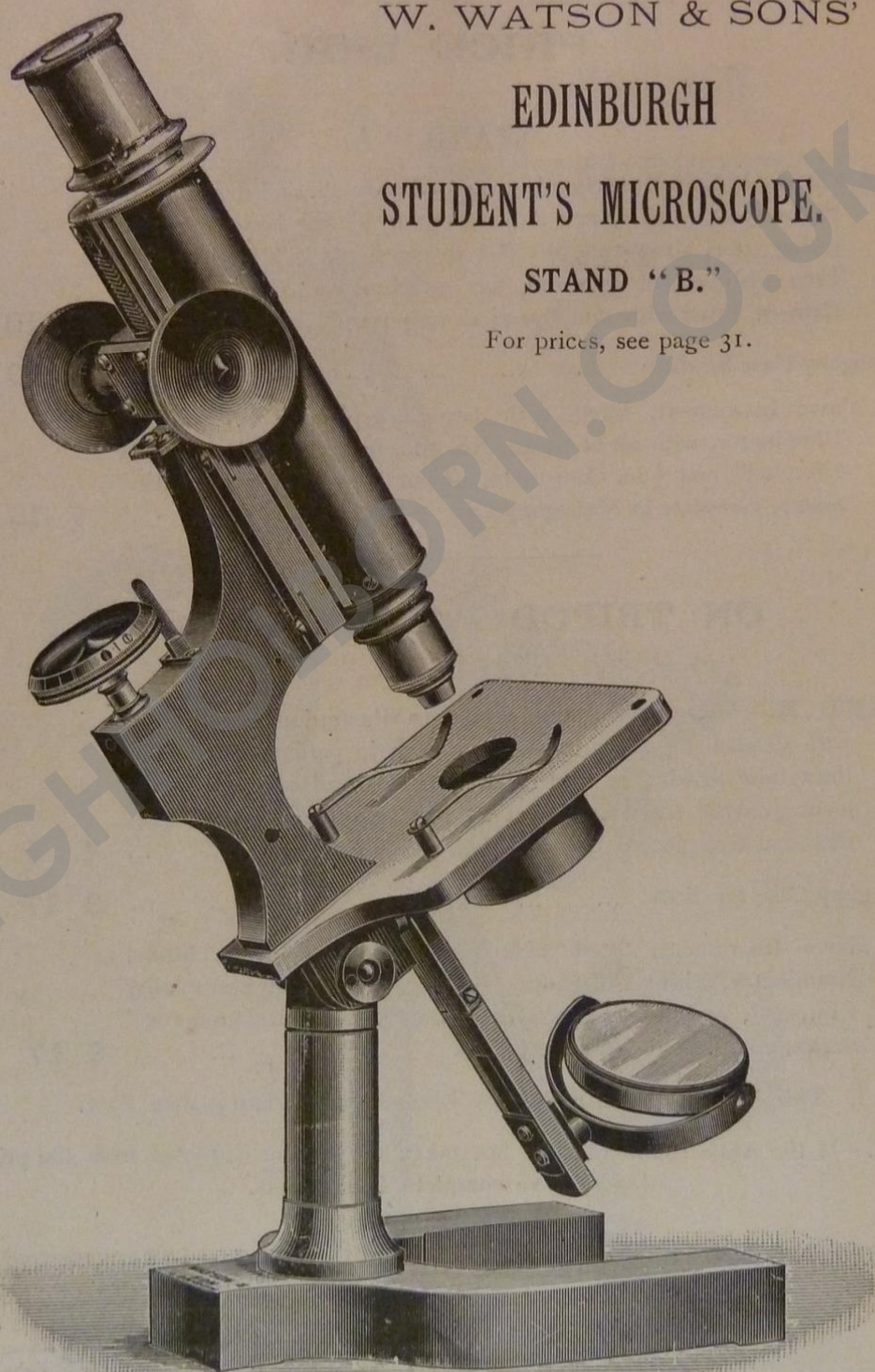
W. WATSON & SONS'

EDINBURGH

STUDENT'S MICROSCOPE.

STAND "B."

For prices, see page 31.



Height, when placed vertically and racked down, $11\frac{3}{8}$ inches.

THE EDINBURGH STUDENT'S MICROSCOPE.

PRICE LIST.

STAND "B."

As figured page 30.

STAND B. —Microscope Stand as figured page 30, exactly similar in construction to the "A" Stand (page 28), but fitted with a best quality Spiral Rack and Pinion Coarse Adjustment, to replace the Sliding Tube. With this Rack and Pinion the smoothest possible motion is ensured, and an entire absence of backlash, the teeth of the pinion never leaving the rack. So effective is it that high powers can be focussed with it, without the aid of the Fine Adjustment. The Milled-head of Fine Adjustment, grooved for attachment to Photographic Camera, and divided to tenths, draw-tube divided to centimetres, fitted with one Eye-piece only (no Objectives)	£4 12 6
Mahogany Case for ditto	0 10 6
Instrument fitted with two Eye-pieces, Abbe Model Illuminator, with set of Stops, No. 122, page 76, highest quality 1in., 25°, and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case	8 15 0

EXTRAS RECOMMENDED FOR THE ABOVE MICROSCOPE.

NEW CENTERING UNDERFITTING , enabling the Condenser to be exactly centred with the Objective, as figured and described page 34	£0 10 6
IRIS DIAPHRAGM TO THE ABBE ILLUMINATOR , to replace the loose stops quoted with the above Instrument ...	0 7 6
SLIDING BAR TO STAGE	0 12 6
FOR BACTERIOLOGICAL WORK—	
$\frac{1}{2}$ in. Homogeneous Immersion Objective, 1.25 N.A.	5 0 0
Double Nose-piece	0 15 0

BINOCULAR BODY.

Stand "B," as described above but with Binocular Body and one pair of Eye-pieces, no Objectives	£7 15 6
Mahogany Case for ditto	0 12 6
Binocular "B" Stand, fitted with three capped Eye-pieces, Abbe Model Illuminator, with Set of Stops, No. 122, page 76, highest quality 1in. 25° and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case... ..	12 0 0

NOTE.—If the Abbe Model Illuminator be not required £1 may be deducted from the price of either of the above complete Instruments. Or the Achromatic Condenser, Optical part No. 129, may replace the Abbe Illuminator at the difference in price, 27/6.

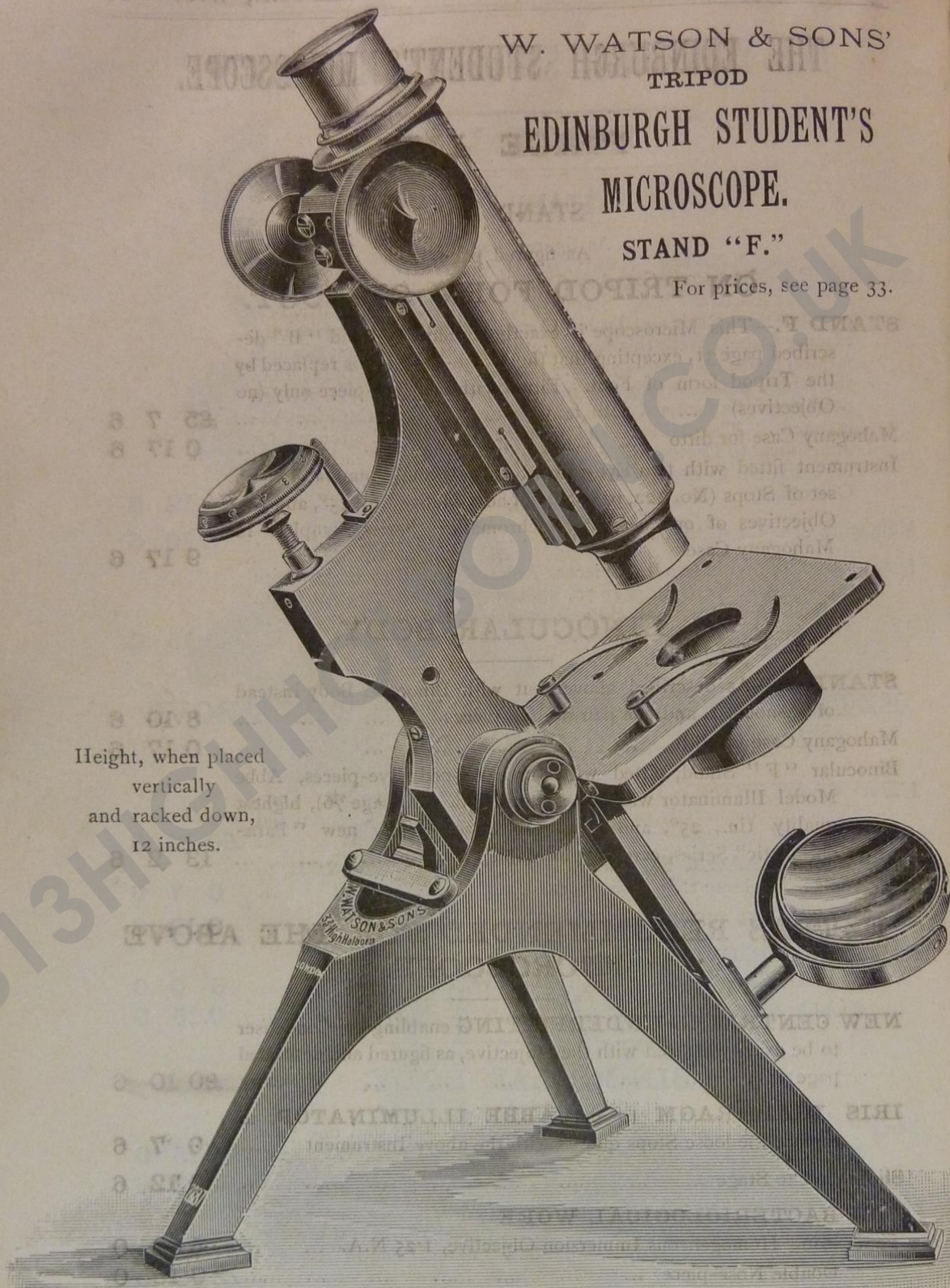
W. WATSON & SONS'
TRIPOD

EDINBURGH STUDENT'S
MICROSCOPE.

STAND "F."

For prices, see page 33.

Height, when placed
vertically
and racked down,
12 inches.



The above Instrument corresponds with Stand "B" of the Edinburgh Student's Microscope,
page 30.

THE EDINBURGH STUDENT'S MICROSCOPE.

PRICE LIST.

STAND "F."

As figured page 32.

ON TRIPOD FORM OF FOOT.

STAND F.—This Microscope is exactly similar to Stand "B" described page 31, excepting that the Horse-shoe foot is replaced by the Tripod form of Foot. Fitted with one Eye-piece only (no Objectives) £5 7 6

Mahogany Case for ditto 0 17 6

Instrument fitted with two Eye-pieces, Abbe Model Illuminator, with set of Stops (No. 122, page 76), highest quality in., 25°, and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case 9 17 6

BINOCULAR BODY.

STAND F.—As described above, but with Binocular Body instead of Monocular, and one pair of Eye-pieces 8 10 6

Mahogany Case for ditto 0 17 6

Binocular "F" Stand, fitted with three capped Eye-pieces, Abbe Model Illuminator with set of Stops (No. 122, page 76), highest quality in., 25°, and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case 13 2 6

EXTRAS RECOMMENDED FOR THE ABOVE MICROSCOPE.

NEW CENTREING UNDERFITTING enabling the Condenser to be exactly centred with the Objective, as figured and described page 34 extra £0 10 6

IRIS DIAPHRAGM to the **ABBE ILLUMINATOR** to replace the loose Stops quoted with the above Instrument 0 7 6

Sliding bar to Stage 0 12 6

FOR BACTERIOLOGICAL WORK—

$\frac{1}{2}$ in., Homogeneous Immersion Objective, 1.25 N.A. 5 0 0

Double Nose-piece 0 15 0

NOTE.—If the Abbe Illuminator is not taken, £1 may be deducted from the price of the above complete Instruments. Or, the Achromatic Condenser Optical part No. 129 may replace the Abbe Illuminator, at the difference in price, 27/6.

THE EDINBURGH STUDENT'S MICROSCOPE. NEW CENTREING UNDERFITTING FOR STUDENTS' MICROSCOPES.



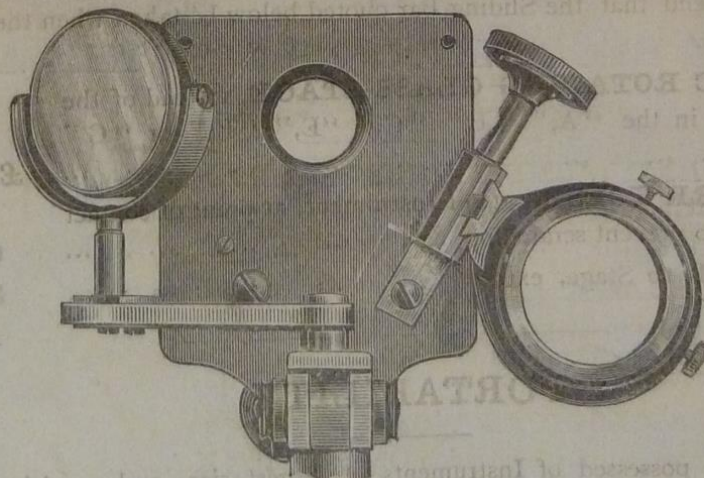
THIS Fitting has been introduced by us, with a view to placing in the hands of workers with Students' Microscopes a means of accurately centreing the Sub-stage Condenser, at a low cost. It consists of the usual underfitting tube, having a flange at the top which is fitted in a box between two plates. The centreing is effected by means of two screws, which press the flange against a spring as in the ordinary Sub-stage Centreing movement. The fitting is designed especially for our Edinburgh Student's Microscope, but can be adapted to almost any form of Student's Microscope.

PRICES.

If supplied to either our "A," "B," "E," or "F" Edinburgh Student's Microscope, instead of the usual form of Underfitting	£0	10	6
*Fitted to almost any make of Students' Microscope	0	14	6
Clamp Screw to Centreing movement, so that when a Condenser is once centred it cannot shift out of centre... ..	0	2	6

* This price might be slightly exceeded if any exceptional alteration were necessary in the adaptation.

SUB-STAGE AS FITTED to the "C," "D," "G," & "H" EDINBURGH STUDENT'S MICROSCOPE.



Underside of Stage of "C" Edinburgh Student's Instrument, showing mirror set at an angle for oblique illumination, and Sub-stage turned aside. The underfittings of the "A," "B," "E" and "F" Stands and the Sub-stages of the "D," "G" and "H" Stands are fitted in the same manner.

This Sub-stage can be applied to many Students' Microscopes, the inclusive cost of fitting being usually £2 2 0

THE EDINBURGH STUDENT'S MICROSCOPE.

MAHOGANY CASES.

The Case ordinarily supplied with the Instruments is a strong, plain, polished mahogany one, with fittings for apparatus, lock and key, &c., and has leather handle for carrying comfortably. We also supply a very superior polished Mahogany Case, having cupboard door to exclude dust and drawers to contain apparatus, with special handle for convenient carrying. The prices are—

For the **Horse-shoe Foot Instruments** £1 15 0
or £1 4 6 extra on the price of the complete Instruments.

For the **Tripod Foot Instruments** £2 10 0
or £1 12 6 on the price of the complete Instruments.

* **GLASS SHADE** for either of the Edinburgh Student's Microscopes 0 6 6

Do. do. do. with ebonized baseboard 0 11 6

* Cost of packing these is charged at cost, and risk of breakage in transit must be borne by purchaser.

EXTRA FITTINGS.

WRIGHT'S FINDER.

This consists of 1 inch of divisions to $\frac{1}{50}$ ths, cut vertically and horizontally on the stage. The position of the object is recorded by these divisions, and on again wishing to see the same part the slide is reset at the divisions. It may be engraved on any stage not having mechanical motions. Price 4/6.

We recommend that the Sliding Bar quoted below be taken when the Wright's Finder is ordered.

CONCENTRIC ROTATING GLASS STAGE, instead of the

Plain Stage in the "A," "B," "C," "E," "F," or "G"

Stands, extra £1 10 0

FITTING CORK TOES to foot of Instrument, at point of contact

with table, to prevent scratching, &c. 0 4 0

SLIDING BAR to Stage, extra 0 12 6

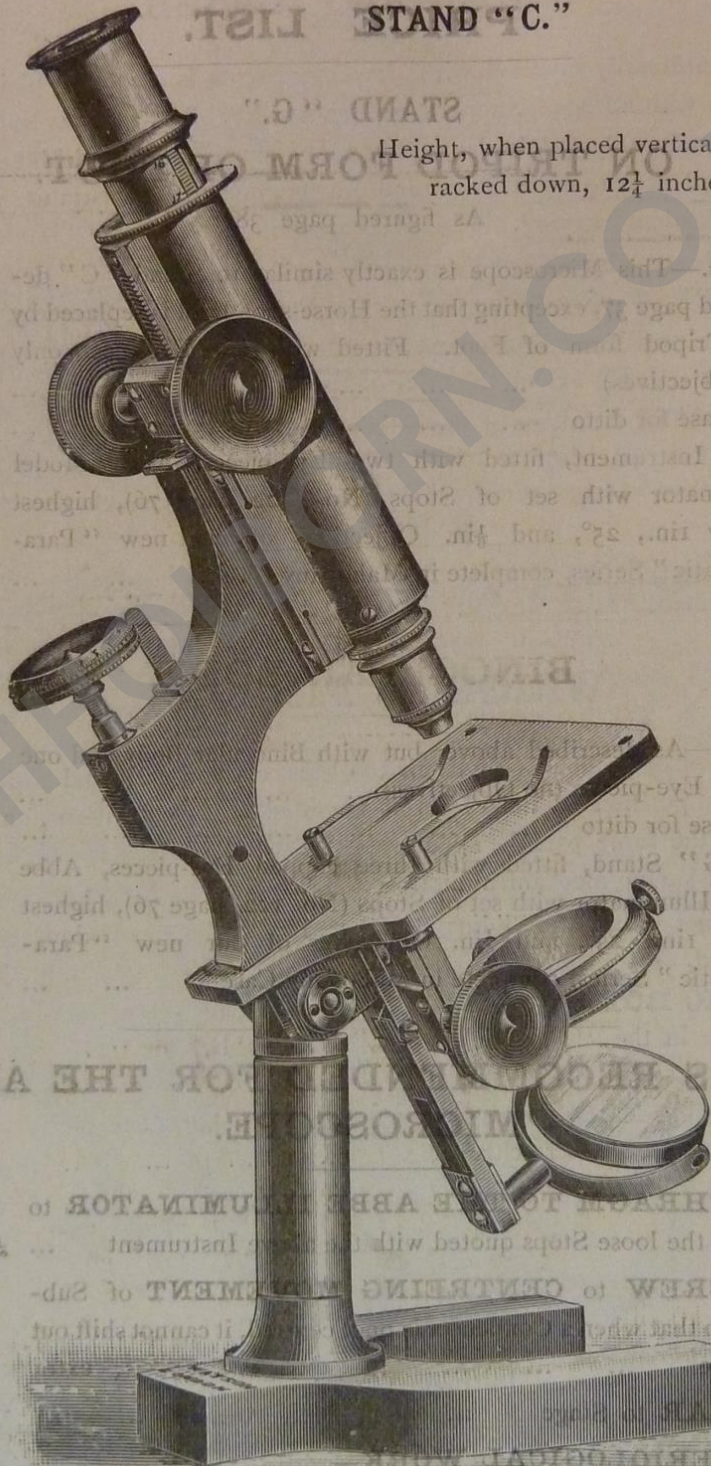
PORTABILITY.

Microscopists possessed of Instruments of largest size, and requiring a more portable form, capable of carrying all the apparatus of the larger Instruments, have often selected the Edinburgh Student's Microscope, and we have made the body-tube to suit their Eye-pieces. We are always open to do this without extra charge, but no Eye-piece is then included with the Instrument.

W. WATSON & SONS' EDINBURGH STUDENT'S MICROSCOPE.

STAND "C."

Height, when placed vertically and
racked down, $12\frac{1}{4}$ inches.



For Prices, see page 37.

Page number 37

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Page number 38

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THE EDINBURGH STUDENT'S MICROSCOPE.

PRICE LIST.

STAND "G." ON TRIPOD FORM OF FOOT.

As figured page 38.

STAND G. —This Microscope is exactly similar to Stand "C" described page 37, excepting that the Horse-shoe Foot is replaced by the Tripod form of Foot. Fitted with one Eye-piece only (no Objectives)		£7 0 0
Mahogany Case for ditto		0 17 6
The above Instrument, fitted with two Eye-pieces, Abbe Model Illuminator with set of Stops (No. 122, page 76), highest quality 1in., 25°, and $\frac{1}{4}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case... ..		12 0 0

BINOCULAR BODY.

STAND G. —As described above, but with Binocular Body and one pair of Eye-pieces (no Objectives)		10 5 0
Mahogany Case for ditto		0 17 6
Binocular "G" Stand, fitted with three capped Eye-pieces, Abbe Model Illuminator with set of Stops (No. 122, page 76), highest quality 1in., 25°, and $\frac{1}{4}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case		15 5 0

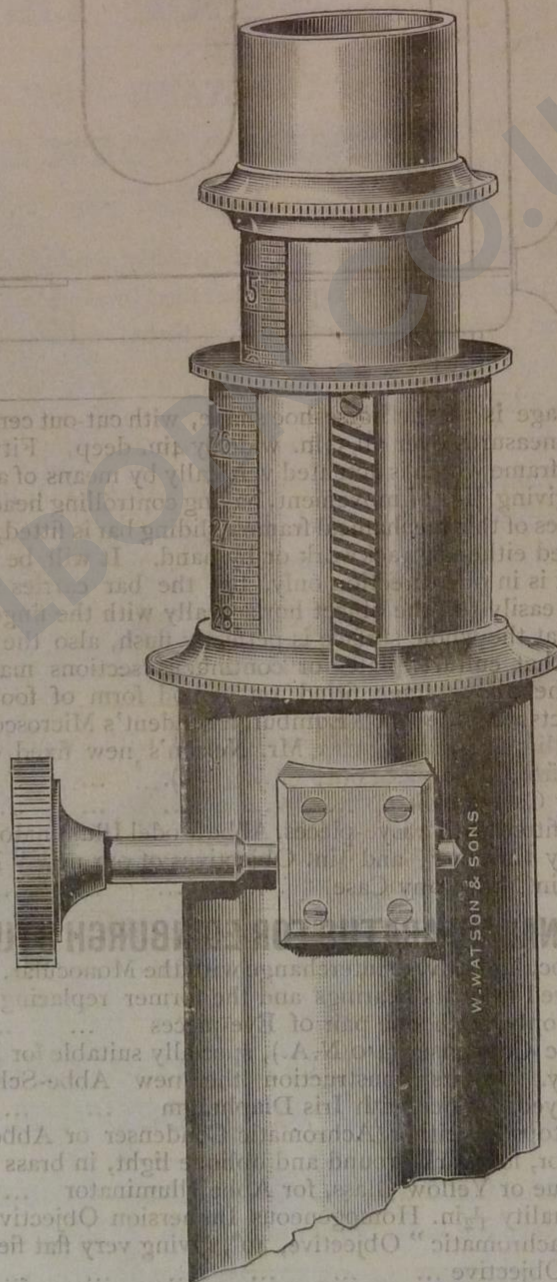
EXTRAS RECOMMENDED FOR THE ABOVE MICROSCOPE.

IRIS DIAPHRAGM TO THE ABBE ILLUMINATOR to replace the loose Stops quoted with the above Instrument		£0 7 6
CLAMP SCREW to CENTREING MOVEMENT of Sub-stage, so that when a Condenser is once centred, it cannot shift out of centre extra		0 2 6
SLIDING BAR to Stage		0 12 6
FOR BACTERIOLOGICAL WORK—		
$\frac{1}{2}$ in. Homogeneous Immersion Objective, 1'25 N.A.		5 0 0
Double Nose-piece		0 15 0

EXTRAS TO EDINBURGH STUDENT'S STANDS.

NEW MECHANICAL DRAW-TUBE.

New form of Rackwork Draw-tube with a second Draw-tube sliding inside as here illustrate I, and described on page 9. Fitted to either of the Edinburgh Student's Microscope Stands, extra £1 5s.

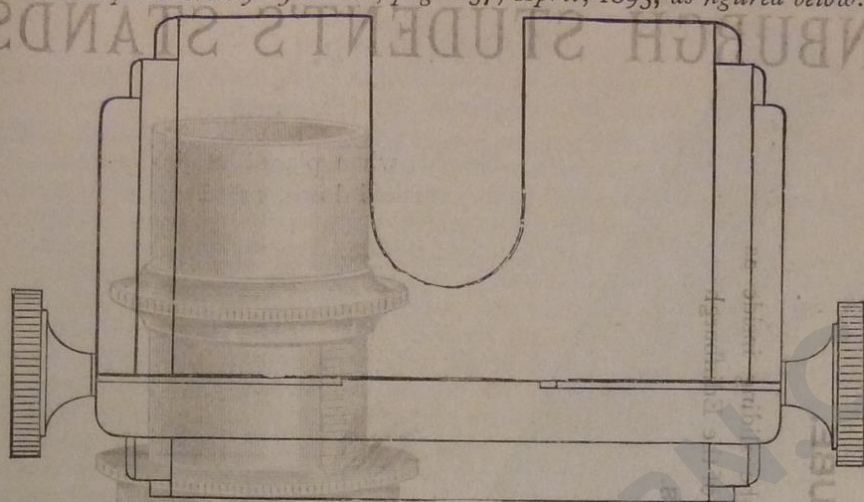


This Rackwork Draw-tube cannot be fitted to Microscopes subsequent to their manufacture; we usually keep the "D" and "H" Stands in stock with it ready fitted, but it can be made to order with *any* of the Edinburgh Student's or Historical Microscopes.

THE EDINBURGH STUDENT'S MICROSCOPE.

MR. E. M. NELSON'S SEMI-MECHANICAL STAGE.

(As made by W. Watson & Sons to the order of Mr. E. M. Nelson. See description Royal Microscopical Society's Journal, page 237, April, 1893, as figured below.)



This Stage is of the horseshoe shape, with cut-out centre, constructed of $\frac{1}{4}$ in. brass plate and measures over all $5\frac{1}{4}$ in. wide by 4 in. deep. Fitting on the edges of the main stage is a frame which is actuated vertically by means of a double rack and pinion from beneath, giving $\frac{3}{4}$ in. of movement, having controlling heads on either side of the stage; on the edges of this mechanical frame a sliding bar is fitted, consequently movement may be imparted either by rackwork or by hand. It will be noticed that the mechanical movement is in one direction only, but the bar carries the object, and enables the worker to easily run the object horizontally with the finger. The advantage of this stage is that the whole surface is perfectly flush, also the pinion heads are below its level, so that culture plates or continuous sections may be conveniently examined.

Price of the above stage fitted on tripod form of foot, and identical in all other respects with the "H" Edinburgh Student's Microscope, having draw-tube divided to millimetres, fitted with Mr. Nelson's new fixed double nose-piece, see page

„ with 1 Eye-piece only	£13 0 0
Mahogany Case for ditto	0 17 6
The above fitted with 2 Eye-pieces, Abbe Model Illuminator with Iris diaphragm, highest quality 1 in., 25°, and $\frac{1}{2}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case	£18 0 0

ADDITIONAL APPARATUS FOR EDINBURGH STUDENT'S MICROSCOPES

Extra Binocular body, to interchange with the Monocular, the latter being removed from its bearings and the former replacing it. Price, to order only, with one pair of Eye-pieces

Achromatic Condenser (1.0 N.A.), specially suitable for Photo-Micrography. In its construction the new Abbe-Schott Glass is employed. Price with Iris Diaphragm

* Set of Stops for either Achromatic Condenser or Abbe Model Illuminator, for dark ground and oblique light, in brass box...

Disc of Blue or Yellow Glass, for Abbe Illuminator ... each

Highest quality $\frac{1}{2}$ in. Homogeneous Immersion Objective (1.25 N.A.)

$\frac{1}{2}$ in. "Parachromatic" Objective, 40°, giving very flat field ...

2 in. ditto Objective ...

Camera Lucida, 6/0; Stage Micrometer ...

Eye-pieces, B, C, or D, each 7/0; E and F, each ...

Polariscope, fitted with Selenite ... 17/6, £1 5s. and

Micrometer to drop into Eye-piece ... 7/6 and

Stand, Condenser ...

Triple nose-piece, bent form ...

Milled-head of Fine Adjustment divided to $\frac{1}{100}$ ths instead of $\frac{1}{10}$ ths, extra

*This item is included in the Abbe Model Illuminator quoted with the complete "D" and "H" Edinburgh Student's Microscopes at £14 and £15 respectively.

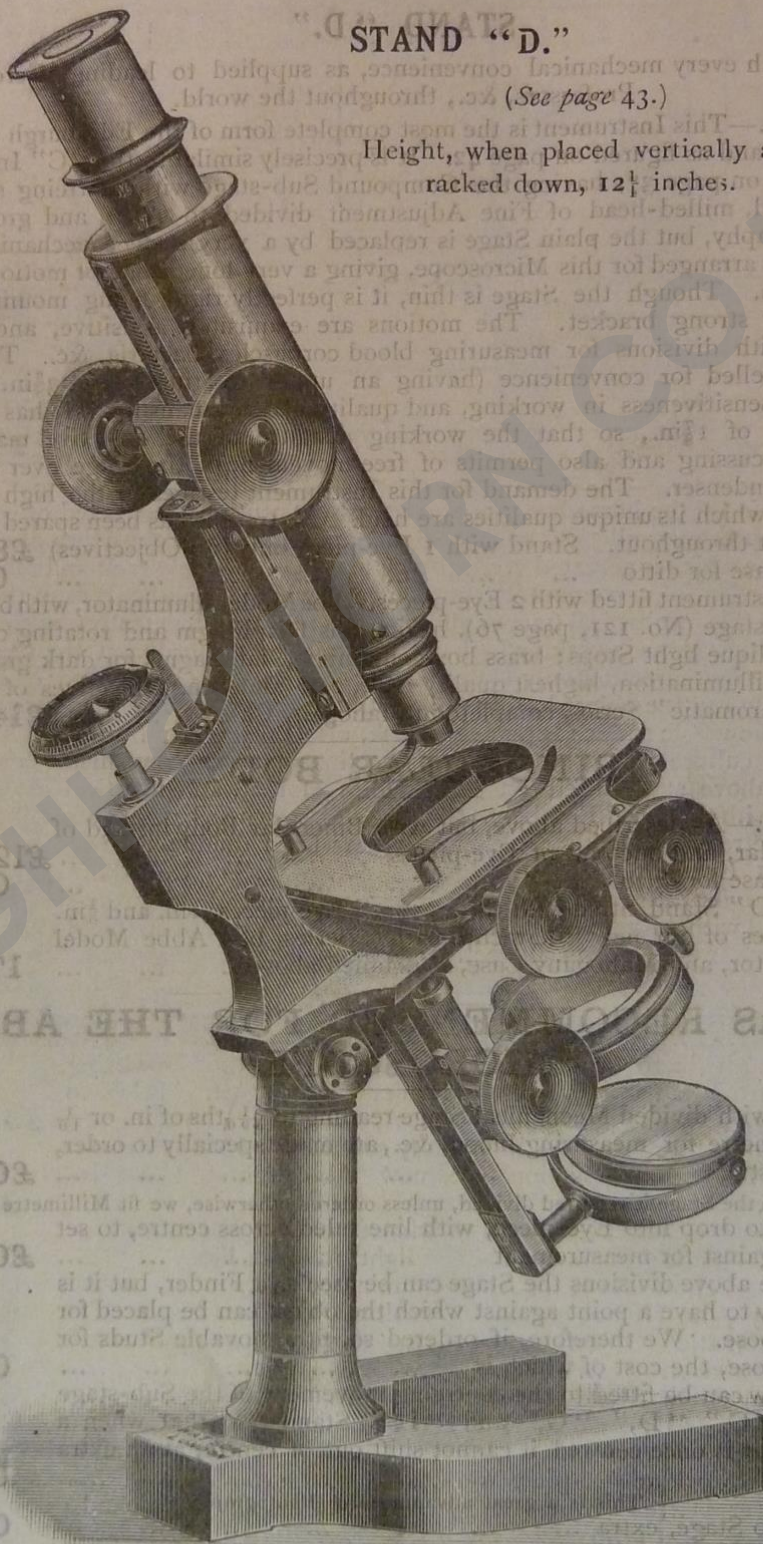
W. WATSON & SONS' EDINBURGH STUDENT'S MICROSCOPE.

STAND "D."

(See page 43.)

Height, when placed vertically and

racked down, 12½ inches.



Complete with every mechanical convenience, as supplied to leading Microscopists, Professors, &c., throughout the world.

W. WATSON & SONS' EDINBURGH STUDENT'S MICROSCOPE.

STAND "D."

Complete with every mechanical convenience, as supplied to leading Microscopists, Professors, &c., throughout the world.

STAND D.—This Instrument is the most complete form of the Edinburgh Student's pattern, and as figured on page 42. It is precisely similar to the "C" Instrument detailed on page 37, having the Compound Sub-stage with centring screws as described, milled-head of Fine Adjustment divided to $\frac{1}{10}$ ths, and grooved for Photography, but the plain Stage is replaced by a very perfect mechanical Stage specially arranged for this Microscope, giving a very long range of motion in each direction. Though the Stage is thin, it is perfectly rigid, being mounted on a specially strong bracket. The motions are exquisitely sensitive, and may be fitted with divisions for measuring blood corpuscles, bacteria, &c. This Stage is unexcelled for convenience (having an upper rotating plate $3\frac{3}{8}$ in. square), perfect sensitiveness in working, and quality of workmanship. It has a central aperture of $1\frac{7}{8}$ in., so that the working distance of the objective may be felt while focussing and also permits of free movement of the Stage over the Sub-stage Condenser. The demand for this Instrument testifies to the high appreciation in which its unique qualities are held. No trouble has been spared to render it perfect throughout. Stand with 1 Eye-piece only (no Objectives) £8 15 0

Mahogany Case for ditto 0 12 6

The above Instrument fitted with 2 Eye-pieces, Abbe Model Illuminator, with best fitting for Sub-stage (No. 121, page 76), having Iris Diaphragm and rotating carrier for using oblique light Stops; brass box containing Diaphragms for dark ground and oblique illumination, highest quality 1in., 25° , and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case £14 0 0

BINOCULAR BODY.

STAND D.—As described above, but with Binocular Body instead of

Monocular, and one pair of Eye-pieces £12 0 0

Mahogany Case for ditto 0 12 6

Binocular "D" Stand, fitted with three capped Eye-pieces, 1in. and $\frac{1}{8}$ in.

Objectives of our new "Parachromatic" Series, best Abbe Model Illuminator, and Mahogany Case, as detailed above... .. 17 5 0

EXTRAS RECOMMENDED FOR THE ABOVE MICROSCOPE.

Instruments with divided Mechanical Stage reading to $\frac{1}{500}$ ths of in. or $\frac{1}{10}$ of millimetre for measuring blood, &c., are made specially to order, extra cost... .. £0 15 0

NOTE.—When the Stage is required divided, unless ordered otherwise, we fit Millimetre Divisions.

Glass Circle to drop into Eye-piece, with line ruled across centre, to set object against for measurement £0 2 0

By having the above divisions the Stage can be used as a Finder, but it is necessary to have a point against which the object can be placed for this purpose. We therefore, if ordered so, fit removable Stud for the purpose, the cost of which is 0 3 0

A clamp screw can be fitted to the centring movement of the Sub-stage of the "C," "D," "G," and "H" Stands, so that when a Condenser is once centred it cannot shift out of centre, at an extra cost of 0 2 6

This is a great advantage for Photography. 0 12 6

Sliding Bar to Stage, extra

FOR BACTERIOLOGICAL WORK—

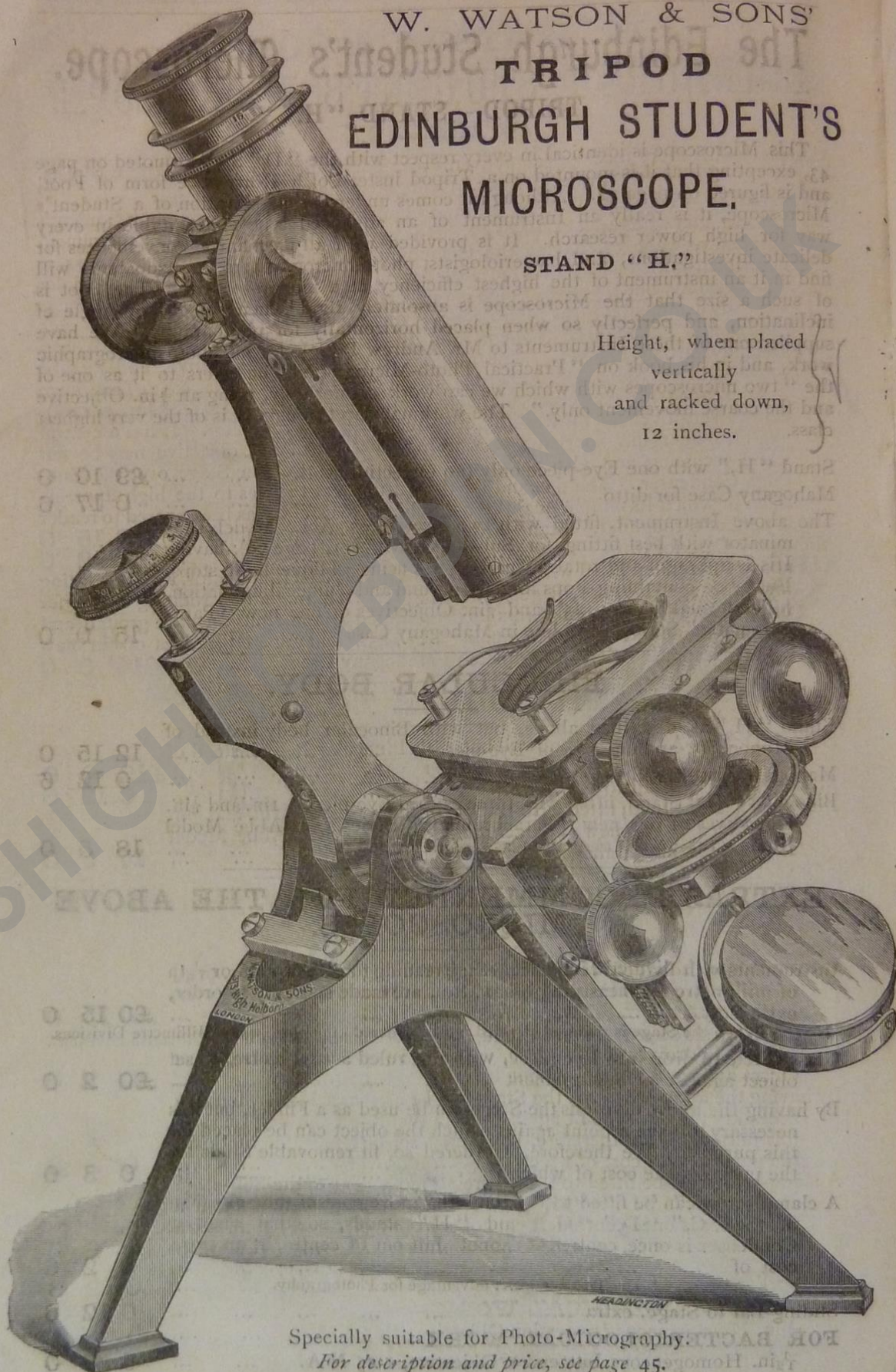
$\frac{1}{2}$ in. Homogeneous Immersion Objective, 1.25 N.A. 5 0 0

Double Nose-piece 0 15 0

W. WATSON & SONS'
TRIPOD
EDINBURGH STUDENT'S
MICROSCOPE.

STAND "H."

Height, when placed
 vertically
 and racked down,
 12 inches.



Specially suitable for Photo-Micrography.
 For description and price, see page 45.

The Edinburgh Student's Microscope.

TRIPOD.—STAND "H."

This Microscope is identical in every respect with the "D" Stand, quoted on page 43, excepting that it is mounted on a Tripod instead of a Horse-shoe form of Foot, and is figured on page 44. Although it comes under the classification of a Student's Microscope, it is really an Instrument of an advanced type and suitable in every way for high power research. It is provided with all mechanical conveniences for delicate investigations, and bacteriologists, photo-micrographers, and amateurs will find in it an instrument of the highest efficiency at a moderate price. The Foot is of such a size that the Microscope is absolutely rigid when set at any angle of inclination, and perfectly so when placed horizontally for photography. We have supplied one of these Instruments to Mr. Andrew Pringle for his photo-micrographic work, and in his book on "Practical Photo-Micrography" he refers to it as one of the "two microscopes with which we can work comfortably, using an $\frac{1}{8}$ in. Objective and the coarse movement only." The workmanship throughout is of the very highest class.

Stand "H," with one Eye-piece only (no Objectives)	£9 10 0
Mahogany Case for ditto	0 17 6

The above Instrument, fitted with two Eye-pieces, Abbe Model Illuminator with best fitting for Sub-stage (No. 121, page 76), having Iris Diaphragm and rotating carrier for using oblique light stops. Brass box containing stops for dark ground and oblique illumination, highest quality 1 in., 25 \times , and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, complete in Mahogany Case

	15 0 0
--	--------

BINOCULAR BODY.

Stand "H," as described above, but with Binocular body instead of Monocular, and one pair of Eye-pieces	12 15 0
Mahogany Case for ditto	0 12 6
Binocular "H" Stand, fitted with three capped Eye-pieces, 1 in. and $\frac{1}{8}$ in. Objectives of our new "Parachromatic" Series, best Abbe Model Illuminator and Mahogany Case, as described above	18 5 0

EXTRAS RECOMMENDED FOR THE ABOVE MICROSCOPES.

Instruments with divided Mechanical Stage reading to $\frac{1}{100}$ ths of in. or $\frac{1}{10}$ th of millimetre for measuring blood, &c., are made specially to order, extra cost... .. £0 15 0

NOTE.—When the Stage is required divided, unless ordered otherwise, we fit Millimetre Divisions.

Glass Circle to drop into Eye-piece, with line ruled across centre, to set object against for measurement	£0 2 0
--	--------

By having the above divisions the Stage can be used as a Finder, but it is necessary to have a point against which the object can be placed for this purpose. We therefore, if ordered so, fit removable Stud's for the purpose, the cost of which is 0 3 0

A clamp screw can be fitted to the centreing movement of the Sub-stage of the "C," "D," "G," and "H" stands, so that when a Condenser is once centred it cannot shift out of centre, at an extra cost of	0 2 6
... .. This is a great advantage for Photography.	0 12 6

Sliding Bar to Stage, extra	5 0 0
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FOR BACTERIOLOGICAL WORK—

$\frac{1}{2}$ in. Homogeneous Immersion Objective, 1.25 N.A.	0 15 0
Double Nose-piece	

W. WATSON & SONS' DAIRY TEACHER'S MICROSCOPE.

(As supplied to the County Councils, and recommended by Mr. F. J. Lloyd,
F.C.S., F.I.C.)

This Microscope is our well-known Edinburgh Student's "B" Stand, figured page 30, arranged to meet the requirements of dairy work.

Fitted with "B" and "D" Eye-pieces, $\frac{1}{2}$ in. and $\frac{3}{4}$ in. Objectives of our new "Parachromatic" Series, Abbe Model Illuminator, with Iris Diaphragm, Eye-piece and Stage Micrometers, Cover Glasses, Slips, &c., complete in Mahogany Case £9 15 0

Mr. F. J. LLOYD writes as follows :

"AGRICULTURAL LABORATORY,
"4, LOMBARD COURT, LONDON,
"17th March, 1893.

"WATSON'S DAIRY TEACHER'S MICROSCOPE.—This Microscope is, in my opinion, admirably adapted for Dairy Teachers.

"(Signed) FREDK. J. LLOYD."

FOR BACTERIOLOGICAL WORK.

According to Professor Koch, of Berlin, the minimum outfit for this work should consist of 2 Eye-pieces, 1 in., $\frac{1}{2}$ in. and $\frac{3}{4}$ in. Objectives, Abbe Illuminator, and Double Nose-piece, therefore add to either of the complete Edinburgh Student's Microscopes

1 $\frac{1}{2}$ in. Homogeneous Immersion Objective, 1.25 N.A.	£5 0 0
Double Nose-piece	0 15 0
	£5 15 0

Our new "Parachromatic" $\frac{3}{4}$ in. Objective is specially designed as an intermediate between the $\frac{1}{2}$ in. and $\frac{1}{4}$ in., and will be found exceedingly advantageous. Price £2 5s.

FOR BREWERS' WORK.

Either of the Edinburgh Student's Microscopes is suitable in the highest degree for Brewers' purposes, and may be selected according to the mechanical conveniences desired. For the Examination of Ferments a $\frac{1}{8}$ or $\frac{1}{4}$ in. Objective is necessary. Either of these may be substituted for the $\frac{3}{4}$ in., quoted with the complete Instruments at an extra cost of 10/-

MAYALL'S MECHANICAL STAGE.

This is fixed to the plain Stage of the Microscope by means of two small milled-head screws; it can, therefore, be quickly fitted or removed, as desired. It is necessary that the distance between the centre of the Stage and the front of the limb of the Microscope should not be less than 2 $\frac{1}{4}$ in. for this to work to full advantage ... £2 15 0

Extra if fitted to the Stage 0 5 0

MICROSCOPES FOR THE TEXTILE TRADE.

The Objectives necessary for examining fabrics are the 2 in. £1 2s., and $\frac{3}{4}$ in. £1 2s. 6d. and occasionally for the separate fibres, the $\frac{1}{4}$ in. £1 10s. A Stand Condenser, price 10/6, is also necessary.

These Objectives should be added to the cost of any Microscope that may be selected from this list. Both the Edinburgh Student's and Histological Instruments are exceedingly suitable for this work.

The following **EXTRACTS FROM LETTERS, &c.**, received from Customers who have used the Edinburgh Student's Microscopes, are selected from a large number with which we have been favoured:—

From Dr. T. Coke Squance, M.D., M.S., F.R.M.S., F.R. Met. Soc., L.S.Sc., etc., Physician and Pathologist to the Sunderland Infirmary: "Messrs. W. WATSON & SONS have lately supplied me with four of their Microscopes, viz., two of their No. 1 Swinging Sub-stage Binocular Instruments, fitted with their patent concentric rotating stages—stages which more than fulfil what they claim for them—one Edinburgh Student's Microscope, Stand 'D,' and one of their No. 6 Microscopes with Swinging Mirror and Sub-stage, into which they have introduced certain modifications. All the instruments are beautifully finished, and adapted for any branch of Microscopical research. I have compared their Objectives with those of other makers, and find they give quite as good, if not better, results, and are much less expensive. The fine adjustment is specially good, being exceedingly delicate and without the slightest lateral movement. For Pathological and Bacteriological work, a better instrument than the Edinburgh Microscope, Stand 'D,' could not be desired, and it is also specially adapted for Photo-Micrography."

From Theodore Brooks, Esq., Santiago de Cuba, Cuba: "I have pleasure in informing you that the Microscope, Edinburgh Student's Stand 'D,' has reached me in good condition, and is quite up to the high expectation I had formed of it. My friend, Dr. Wilson, of Philadelphia, who has seen it, is so pleased, that he wishes one like it. Therefore, please supply as follows:—"

From Dr. Ed. de Freudenreich, Bacteriologisches Laboratorium, der Molkereischule Rütli in Bern, Switzerland: "I am always exceedingly pleased with the 'H' Edinburgh Student's Microscope—you ought to put more clearly in the catalogue that it is not only a Student's Microscope, but a very convenient Instrument for high power work, and especially for Bacteriology. The name 'Student's Microscope' involves the idea of a less perfect Instrument. I think that its size, which is just the good one, renders it very convenient for daily work."

From Dr. C. Herbert Hurst, Assist. Lecturer in Zoology, Owens College, Manchester: "I have to-day seen your Student's Microscope for the first time. It appears to me to be the best Student's Instrument by a British maker I have yet seen. We have hitherto used, almost exclusively, the Instruments by Continental makers, and I am heartily glad to find a real competitor amongst British manufacturers."

From Dr. Henry Power, Dept. of Pathology of the College of Physicians and Surgeons, New York: "I wish to say the 'B' Edinburgh Student's Microscope has given entire satisfaction, and has been much praised. As I am situated in the largest medical college in the country, I have been able to recommend many of my friends to pay you a visit on going to England."

From W. H. Leek, Esq., Grammar School, Newbury: "When up in town, during the Christmas vacation, I obtained from you an 'Edinburgh Student's Microscope,' 'C.' I am pleased to say it suits me in every way, and seems specially fitted for the class of work required for the London Science Degree."

From Dr. F. Chas. Berrini, Rue Gay-Lussac, Paris: "I have examined at the Exhibition your Edinburgh Student's Microscope, and I am of opinion that it deserves unqualified preference over all other Students' Microscopes of the Continental type and of Continental make. I have decided to order one for my own use as per list below."

From Dr. Henry S. Gill, 20, East Twelfth Street, New York: "When in England last summer I purchased a 'C' Edinburgh Student's Microscope of your firm. . . . Your stand and apparatus have been much admired over here."

Further, after purchasing a "D" Instrument: "I am in receipt of the Microscope—'D' Edinburgh Student's. The Stand and Objective please me immensely, and I desire to thank you for the efficient manner in which the order was executed."

From Lord E. S. Churchill, Moreton-in-Marsh: "Lord E. Churchill is very much pleased with the Microscope (Stand 'D' Edinburgh Student's) he bought from them some time ago, and considers it quite the best pattern for a Student's Stand on the market."

From Nelson B. Sizer, Esq., M.D., Surgeon and Pathologist to the Bushwayck Hospital, Brooklyn, New York, U.S.A.: "The 'H' Edinburgh Stand and fittings arrived safely. I am pleased in every way. The Stand is fine and solid; the workmanship of the best, and the performance excellent in all ways. I am surprised at the slowness, delicacy, and softness of your Fine Adjustment. I am sure I have never seen a better in more than 20 years' teaching of and work with the Microscope. The Instrument is very handsome and imposing in appearance, and an ornament to any office or laboratory."

From W. R. Pennell, Esq., Lincoln Nurseries and Seed Establishment, Lincoln: "I may say I am exceedingly pleased with the Microscope ('D' Edinburgh Student's). It is a perfect piece of workmanship, and offers every facility for the most delicate investigation."

From George Rudd Thompson, Esq., Analyst, &c., 28, Dock Street, Newport, Monmouthshire, 1st July, 1890: "I have received the Microscope, &c. ('D' Edinburgh Student's), and am highly delighted therewith." Further, on 4th July, 1890: "I handed the whole Microscope to a friend of mine (a member of the Quekett Club), who pronounces it to be a 'Grand Microscope' and all that can be desired. For my own part I can only say it suits me admirably, and forms the basis of what can be made perfect by additions from time to time. It has no parts unnecessarily complicated, and is faultless in workmanship." And on the 14th July, 1890: "The more I use the Microscope, $\frac{1}{2}$ in. and $\frac{1}{4}$ in., the better am I pleased. The definition in the case of adulteration of flour, &c., is very fine."

Extract from "Photography applied to the Microscope," by F. W. Mills, Esq., F.R.M.S., Member of the Camera Club, &c.: "A good fine adjustment is absolutely necessary for obtaining a well-focussed image. The author considers the form adopted in W. WATSON & SONS' Microscopes the best. He has used one of their 'D' Edinburgh Student's Microscopes for a considerable time, and fails to perceive the slightest deterioration as the result of wear, even with high power Objectives."

From W. J. Simmons, Esq., 6, Hastings Street, Calcutta: "The steadiness of the Stand ('D' Edinburgh Student's), the character of the adjustments, and the smoothness and ease with which the various mechanical appliances act, are exceedingly satisfactory. It is a splendid instrument."

From the Rev. F. Fuller, The Grove, Bedford: "I am exceedingly pleased with the Instrument you supplied ('D' Edinburgh Student's), and it has been admired by all who have seen it."

From J. Stewart Fowler, Esq., Edinburgh: "I have just purchased one of your Edinburgh Student's Microscopes, and am much pleased with it, as also are those to whom I have shown it. It seems to me especially suited for Photo-Micrography owing to its fine adjustment and rigidity."

From F. O. Broady, Esq., M.D., The Physio-Medical College, Chicago, Ill., U.S.A., 31st March, 1894: "The Microscopes that our College ordered from you last fall have, after a College term of hard usage, proved themselves to be of most excellent construction in all the respects that go toward making up a desirable Laboratory Instrument. I am speaking now of the three Student's 'B' Stands."

From W. B. Boyes, Esq., Johannesburg, S. Africa: "I am very much pleased with the Instrument ('H' Edinburgh Student's). The workmanship is excellent, and I like the model very well. I thank you for the care and exactness with which you have carried out my instructions generally, and in the rack to draw-tube, and the fine adjustment in particular. The fine adjustment works as you say, perfectly."

From A. J. Jenkins, Esq., President South Eastern Naturalists' Club, Deptford, S.E.: "I feel it necessary to write you expressing the entire satisfaction which your Edinburgh Student's Microscope Stand 'D' has given to myself and friends. I exhibited it on September 26th at the Exhibition Meeting of the South Eastern Naturalists' Club, of which I am President, when all who examined the Microscope expressed their approval of the utility of the various working parts, and were well satisfied with the defining power of the objectives."

From Professor R. N. Hudspeth, Bishop's College, Lennoxville, Quebec: "There is a great deal to admire in the 'II' Edinburgh Student's Microscope. The Stage movements and the coarse adjustment are all that can be desired, while the fine adjustment works with a precision and delicacy beyond any praise."

From J. N. Cheetham, Esq., 57, Alexandra Road, Southport: "As far as I have tried the Microscope, 'D' Edinburgh Student's, it has given me the most entire satisfaction. It works beautifully, and with both Objectives gives brilliant and clear cut images. I have great pleasure in testifying to the excellence of the instrument, and shall be glad to recommend it to my friends."

From Charles D. Soar, Esq., 20, Cortayne Road, Hurlingham, S.W.: "I have now had your Edinburgh Student's Microscope Stand 'D' some few months, and I have great pleasure in testifying to the excellence of its construction and finish, and the defining power of the objectives supplied with it."

Translation from page 292, &c., of "Examens de las Aguas Potables" (Chemical and Bacteriological Examination of Drinking Waters), by Messrs. A. E. Salazar and C. Newman: "Of more recent date still is an apparatus, possessing the advantage of having a mechanical Stage, which is a marvel of accuracy. This is the Edinburgh Student's Microscope (Fig. 51), manufactured by W. WATSON & SONS, of London. . . These Instruments are carefully constructed even in the smallest details, and taking them at the price they are very superior to the cheap Microscopes which are now being made by English and Continental makers, for the same special purpose of Bacteriological researches."

From Alexander Pollock, Esq., The Treasury, Cape Town, South Africa: "I have shown the Microscope ('B' Edinburgh Student's) to the Government Botanist, who approves of the workmanship, and compared it favourably with those in use in the Gardens."

EXTRACTS FROM A DESCRIPTION OF THE

EDINBURGH STUDENT'S MICROSCOPE,

By DR. HENRI VAN HEURCK, of Antwerp, in the "Journal de Micrographie,"
10th August, 1889:—

"Both the coarse and fine adjustments of the Edinburgh Student's Microscopes are made with adjustable slides. This is most important, as it permits of the movements being always kept up to their bearings, whereas the movements on the Continental instruments, although good at first, become loose after they have been used a few times, and there is no means of tightening them, owing to the system of fixed guides adopted by the makers."

"The milled-head of the fine adjustment is large; the screw is very fine and exceedingly soft in working, and allows of focussing with the greatest precision."

"The illuminating parts of the instrument are better understood and more complete than in the Continental Microscopes. In the No. 'C' model there is a full-sized sub-stage, which is raised and lowered by rackwork, and centred by lateral screws."

"The 1 in. objective is very good. The images of histological preparations with it are exceedingly pure and well defined. It will also stand a very deep eye-piece without depreciation in performance."

"The 4 in. objective is equally excellent for all purposes. It has a very long working distance, and the images seen through it are exceedingly brilliant and sharply defined. For histological work this objective leaves nothing to desire."

W. WATSON & SONS' HISTOLOGICAL MICROSCOPE.

THESE Instruments have been designed specially for the use of Class Students, and the great demand for them testifies to the appreciation of their merits. They are altogether superior, in both optical and mechanical parts, to the Instruments usually sold for Students' use at a low price, and it is only by making them in large numbers that we are able to produce so excellent an Instrument at so small a cost. They are made throughout on our own premises, and are of the highest quality and workmanship.

ALL THE ADJUSTMENTS are of the perfected description described on pages 3 and 4, and with these Instruments the most delicate work may be done.

ALL THE FITTINGS are of universal size, so that if subsequently, further accessories are required to be added, the Instrument will take them.

THE STAGE is of extra large size.

THE BODY is of Continental length, but is provided with a draw-tube, which draws out to the English length.

THE OBJECTIVES are of our new "Parachromatic" Series and are quite superior to those supplied with any other Instrument, English or foreign, sold at the same price. They are made on our own premises, and we guarantee the performance of each one of them. The amplifications with the draw-tube closed or extended are the same as with the Edinburgh Student's Microscope, see page 29.

We have supplied these Instruments to nearly all the leading Medical Schools, Colleges, County Councils, &c., and we can most confidently recommend them to Students in Botany, Histology, &c., as of the highest class and efficient in the most eminent degree.

They are made in two forms, as follows :—

Special Note.—These Instruments being designed specially for Students, and our desire being to supply them at as economical a rate as possible, the prices for them are quoted at the WHOLESALE RATE, and no reduction can be made, even if large numbers are ordered together, the low price leaving an exceedingly small percentage of profit over the actual cost of manufacture. See also note, page 27.

W. WATSON & SONS' HISTOLOGICAL MICROSCOPE.

STAND "A."



A.—Instrument, as illustrated above and described page 50,
with coarse adjustment by sliding body in perfect
fitting tube, having plane and concave Mirrors, and
one Eye-piece only (no Objectives) ... £3 0 0

Mahogany case for ditto ... 0 10 0

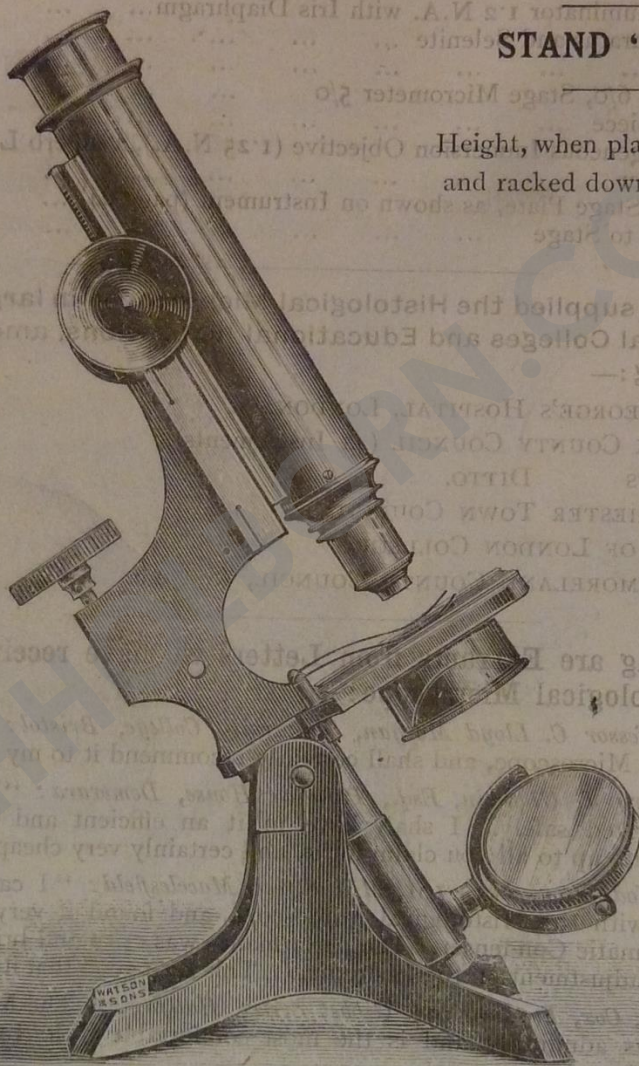
The above Instrument fitted with best quality rin., 25°,
and 1/4 in. Objectives of our new "Parachromatic"
Series, in Mahogany Case ... 5 5 0

(Additional Apparatus, see page 53.)

W. WATSON & SONS' HISTOLOGICAL MICROSCOPE.

STAND "B."

Height, when placed vertically
and racked down, 9 $\frac{3}{4}$ inches.



B.—Instrument as illustrated above and described page 50,
having Spiral Rack and Pinion coarse adjustment, and
fitted with plane and concave Mirrors, and 1 Eye-piece
only (no Objectives) ... £4 0 0

Mahogany Case for ditto 0 10 0

The above Instrument fitted with best quality 1 in., 25 \times ,
and $\frac{1}{6}$ in. Objectives of our new "Parachromatic"
Series, in Mahogany Case 6 5 0
(Additional Apparatus, see page 53.)

Additional Apparatus for the Histological Microscope.

(Figured pages 51 and 52.)

Centring Underfitting, as figured and described page 34	...	..	£0 14 6
Eye-pieces, B, C, & D 7/- each; E or F, each	...	...	0 12 6
Abbe Model Illuminator 1.2 N.A. with Iris Diaphragm...	...	...	1 12 6
Polarising Apparatus and Selenite	...	...	0 17 6
Spot Lens	...	...	0 7 6
Camera Lucida 6/0, Stage Micrometer 5/0	...	...	0 11 0
Double Nose-piece	...	...	0 15 0
$\frac{1}{2}$ in. Homogeneous Immersion Objective (1.25 N.A.), a superb Lens	...	...	5 0 0
Stand Condenser	...	...	0 7 6
Upper Sliding Stage Plate, as shown on Instrument (page 64)	...	...	0 8 6
Or Sliding Bar to Stage	...	...	0 12 6

We have supplied the Histological Microscopes in large numbers to many Medical Colleges and Educational Institutions, among which are the following:—

ST. GEORGE'S HOSPITAL, LONDON.

ESSEX COUNTY COUNCIL (44 Instruments).

HERTS DITTO.

COLCHESTER TOWN COUNCIL.

CITY OF LONDON COLLEGE.

WESTMORELAND COUNTY COUNCIL, &c., &c.

The following are Extracts from Letters we have received concerning the Histological Microscope:—

From Professor C. Lloyd Morgan, University College, Bristol: "I am pleased with your little Microscope, and shall certainly recommend it to my students."

From Henry J. Gladwin, Esq., Paradise House, Demerara: "The Histological Microscope arrived safely. I shall have in it an efficient and pleasant working Instrument, quite up to all you claim for it, and certainly very cheap."

From J. Hodgkinson, Esq., 101, Mill Street, Macclesfield: "I carefully tested the $\frac{1}{2}$ in. supplied with the Histological Microscope, and found it very good, especially with the Achromatic Condenser. The performance was crisp and brilliant. You mentioned the fine adjustment on the Instrument. This is so good that it needs no praise."

From J. L. Cox, Esq., of 134, Gibbet Street, Halifax: "The Microscope (Histological) answers admirably, and is the most comfortable little Instrument to work with that I have seen."

From J. E. Wright, Esq., of 11, Marlborough Place, Banbury: "I have much pleasure in bearing my testimony to the value of the Instrument (Histological), as a better one at the figure I have never seen, and it has answered most admirably in every way I have tested it."

From E. W. Andrew, Esq., of 2, Union Street, Rochester: "Your Histological Microscope is excellent. Its objectives are of the best defining power, and I am more than satisfied with it. I shall recommend it to any who are in want of a good Instrument at a low price."

From the Rev. R. M. Miller, M.A., Clonmel: "I have much pleasure in saying that your Histological Microscope has given great satisfaction. I tested it in every way, and found it most satisfactory. I am especially pleased with the action of the coarse and fine adjustments."

From W. H. Wynn-Williams, Esq., Shrewsbury: "The Histological Microscope has been working very well. The adjustments are accurate, and the lenses exquisite, and of beautifully clear definition. I shall not fail to recommend your workmanship in all departments, to friends interested in microscopy."

The Edinburgh Student's Outfit.

‘H’ Tripod Edinburgh Student’s Microscope, with 2 Eye-pieces, 1in. and $\frac{1}{2}$ in. “Parachromatic” Objectives, Abbe Model Illuminator complete with Iris Diaphragm and set of Stops, in Mahogany Case			£15	0	0
Divisions to movements of Stage, reading to $\frac{1}{10}$ th millimetre	...	...	0	15	0
Clamp Screw to centring movement of Sub-stage	...	...	0	2	6
Exchanging Optical part of Abbe Illuminator for Optical part of Achromatic Condenser (1.0 N.A.), (page 76)	...	...	1	7	6

EXTRA “PARACHROMATIC” OBJECTIVES—

2in., 17° £1 2s., $\frac{1}{2}$ in. £1 2s. 6d.	...	...	2	4	6
Homogeneous Immersion $\frac{1}{2}$ in.	...	...	5	0	0

ACCESSORY APPARATUS—

Polariscope of large size (No. 141) £1 15s., with adapter (2/6) to fit into and work with the Condenser named above	...	...	1	17	6
Eye-piece Micrometer (No. 204) 5/0, Stage Micrometer (No. 203) 5/0	...	...	0	10	0
Double Nose-piece 15/0, Live Box (No. 222) 10/6	...	...	1	5	6
Rousselet’s Compressor (No. 223)	...	...	0	15	0
Microscope Lamp (No. 254) £1 5s., Mahogany Case 7/6	...	...	1	12	6
Aplanatic Bull’s Eye Stand Condenser (No. 180)	...	...	1	10	0
Beale’s Camera Lucida 6/0, Set of 12 Test Objects in Case £1 1s.	...	...	1	7	0

MATERIALS FOR MOUNTING—

Cabinet of mounting Apparatus (No. 301)	...	...	2	5	0
Laboratory Dissecting Microscope with Sliding Adjustments	...	...	1	7	6
Three Aplanatic Magnifiers to work with same (Nos. 232/4)	...	...	2	3	6
Dissecting Dish 1/0, Set of “County Council” Dissecting Instruments 15/0 (No. 288)	...	...	0	16	0
Cathcart Microtome for Imbedding and Freezing (No. 264)	...	...	1	1	0
Plane Iron 2/6, Section Knife 4/6	...	...	0	7	0

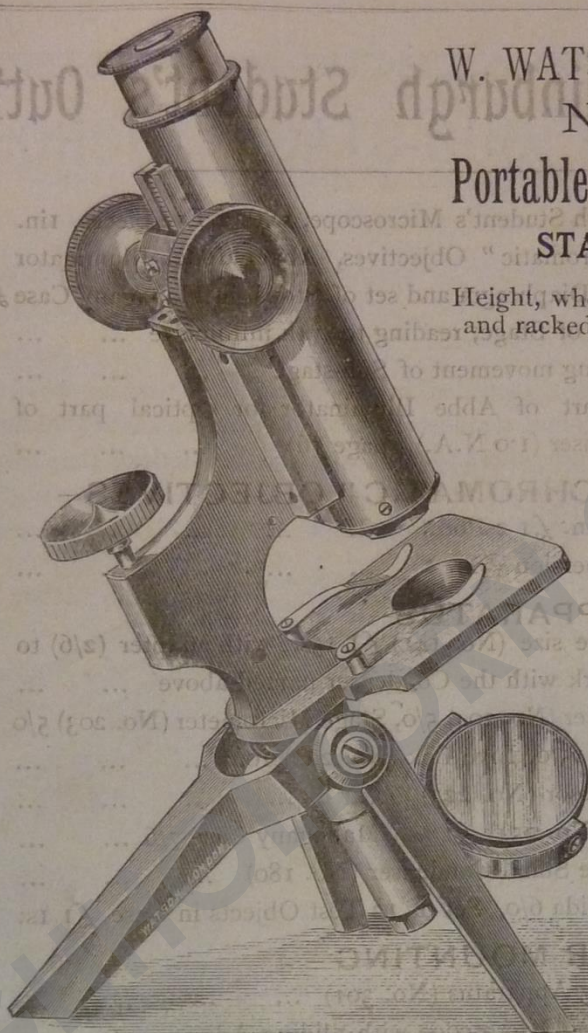
PHOTO-MICRO. APPARATUS—

Student’s Photo-Micro. Camera (see page 96)	...	...	4	15	0
Two Inner Frames 3/6, Fitting Microscope, &c., and Supplying Connecting Flanges 16/6	...	...	1	0	0
Focussing Glass 8/6, Projection Eye-piece £2	...	...	2	8	6
Chest containing Chemicals for Development, &c.	...	...	1	12	6
	...	...	£51	3	0

All necessities for Photo-Micrography with Oil light are included above.

If Oxy-Calcium or Oxy-Hydrogen Light is desired the first five items of Sets Nos. 1 or 2 (page 100) should be added to the above.

Any other Microscope in this list can be substituted for the one quoted above.

W. WATSON & SONS'
No. 6Portable Microscope.
STAND "B."Height, when placed vertically
and racked down, $9\frac{3}{4}$ inches.

This Instrument is similar in general detail to the Histological Microscope, pages 50 to 52, but the Foot, Mirror Stem, &c., are made to fold up in exceedingly compact form, and when set up for use the Stand is perfectly rigid. Portable Microscopes are, as a rule, but makeshifts. This, however, is a thoroughly sound practical Instrument and capable of best work with the highest power Objectives, having our perfected adjustments (as described on pages 3-6), and universal size fittings throughout, so that full-sized Objectives and Apparatus can be employed with it. We most strongly recommend it. It may be had with any desired large size of body without extra charge; but no Eye-piece is then supplied.

PRICES.

- A. Stand with coarse adjustment by sliding body and our perfected Fine Adjustment, fitted with 1 Eye-piece ... £4 5 0
- B. Stand with coarse adjustment by spiral rack and pinion, and having our perfected Fine Adjustment, as figured, fitted with 1 Eye-piece ... 5 5 0
- The above fold up into a case, the outside dimensions of which are $8\frac{1}{2}$ by 6 by $3\frac{1}{2}$ in.
- Mahogany Case for either of the above Instruments ... 0 10 6

No. 7.—TRAVELLER'S MICROSCOPE.

No. 7.—A Monocular Stand on a tripod foot, which all closes up together for compactness and portability; has double mirror, sliding coarse motion to focus, Micrometer screw fine adjustment, and draw-tube; it is fitted with the universal thread to take any objective, and also takes the ordinary full-size eye-pieces, so that the eye-glasses and powers from a large instrument can be used with it; a well-made instrument ... £2 2 0

Eye-pieces for above, A, B, or C ... 0 11 6

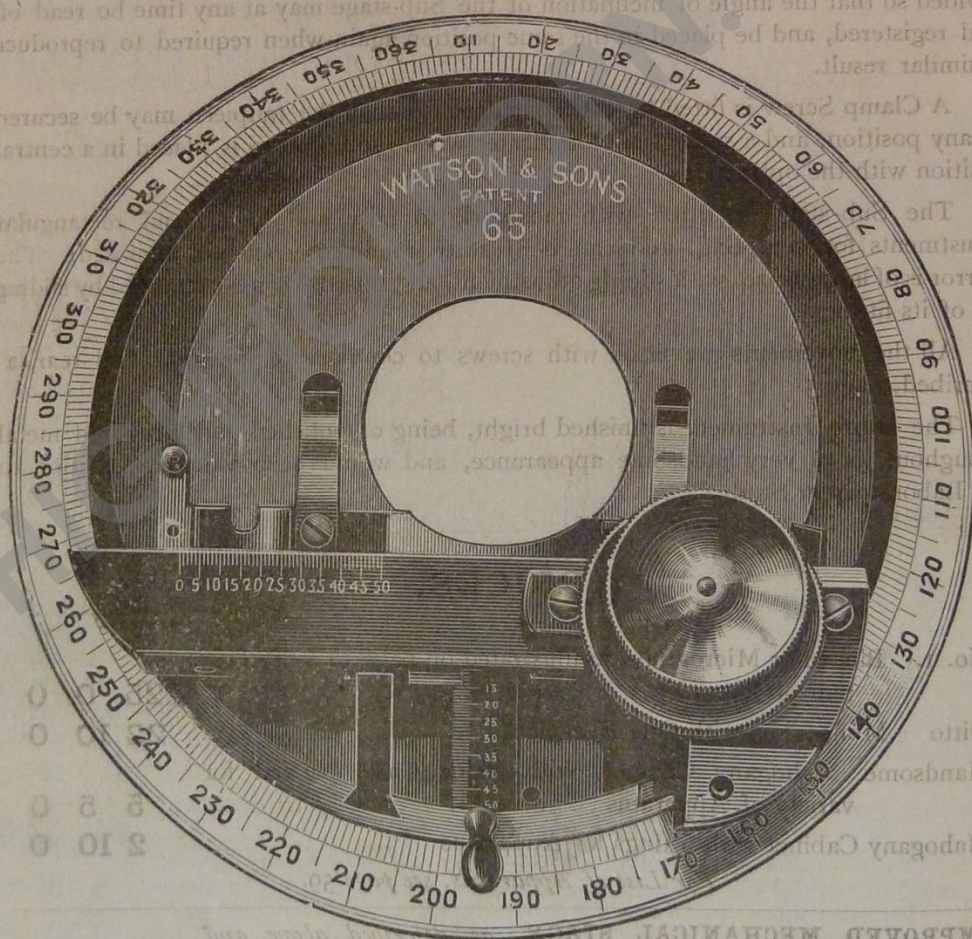
Mahogany Case, 10/-; Under fitting for Apparatus, extra ... 0 3 6

W. WATSON & SONS' SWINGING SUB-STAGE MICROSCOPE.

(See page 58.)

THIS Instrument is throughout of the very highest quality and perfection of workmanship. It is a most convenient pattern Instrument for ease of manipulation, and is replete with every improvement and facility.

The Stand is mounted on double pillars fixed to a rotating base plate on a flat tripod foot, giving extreme steadiness; has our spiral rack and pinion coarse adjustment, which gives the smoothest possible motion, the teeth of the rack never leaving the pinion; improved form of fine adjustment (as described, page 3), and is fitted with our Improved Concentric Rotating Stage, as figured below.



Improved Concentric Rotating Stage.

The advantages of this Stage are, that it is thin but exceedingly firm, having delicate mechanical movements, giving 1 inch of motion in either direction, the controlling milled-heads of which being both upon one axis place the motions of the object completely under the control of one hand, and that, too, in a most convenient position, this also allowing of a diagonal movement being obtained by turning both of the milled-heads together.

The Stage *rotates completely* within a broad fixed ring. This ring is divided to degrees, and the readings are taken by two verniers 180° apart, by means of which great accuracy is ensured.

The Stage Plates are divided to fiftieths of an inch, and can be used as a finder.

The method adopted for fixing the object by means of an adjustable spring, capable of being turned aside or removed altogether when requisite, leaving the Stage completely clear, is particularly convenient, enabling large objects, such as the contents of a zoophyte trough, &c., to be advantageously seen.

We have added many improvements to the Stage of late, fitting an extra slide to the vertical movement, on the left-hand side of the Stage, and rather stouter plates, so giving increased rigidity and perfect truth in working.

This Instrument is fitted with a Swinging Sub-stage; a circle being fixed behind the Stage, with the arm holding the Mirror, able to rotate in it concentrically with the object, either above or below the Stage, and with the outer edge of the circle divided so that the angle of inclination of the Sub-stage may at any time be read off and registered, and be placed in the same position again when required to reproduce a similar result.

A Clamp Screw is fitted to this movement, so that the tailpiece may be secured in any position, and a spring-catch indicates when the tailpiece is placed in a central position with the optic axis.

The Sub-stage is fitted with rackwork to raise and lower, and rectangular adjustments for centring, and can be readily removed when not required. The Mirror is of largest size, with sliding adjustment, and this also can be removed by sliding out of its fitting.

All the movements are fitted with screws to compensate for wear and tear, a described, page 5.

The entire Instrument is finished bright, being of polished and lacquered metal throughout, is of very handsome appearance, and would be a valuable addition to any Laboratory or Study.

PRICES.

No. 1.	Binocular Microscope, as illustrated on page 58, with One pair of Eye-pieces	...	...	...	...	£25 0 0
Ditto	Monocular, with One Eye-piece	...	...	...	...	22 10 0
Handsome	Mahogany Cabinet, with inside Case, packed for variety of Apparatus	...	...	...	...	5 5 0
Mahogany	Cabinet with fittings for Apparatus	...	...	...	...	2 10 0

For List of Apparatus, see page 59.

IMPROVED MECHANICAL STAGE, as described above and figured p. 56, may be fitted to any Instrument. Divided outer circle reading by verniers, and divided for use as a finder to $\frac{1}{16}$ in. in each direction

£7 15 0

Ditto ditto, of the most elaborate construction, rotating by rackwork, the pinion being able to throw out of gear, to rotate quickly by hand when required, centring screws to make the rotation perfectly concentric with any objective, fully divided in every necessary manner

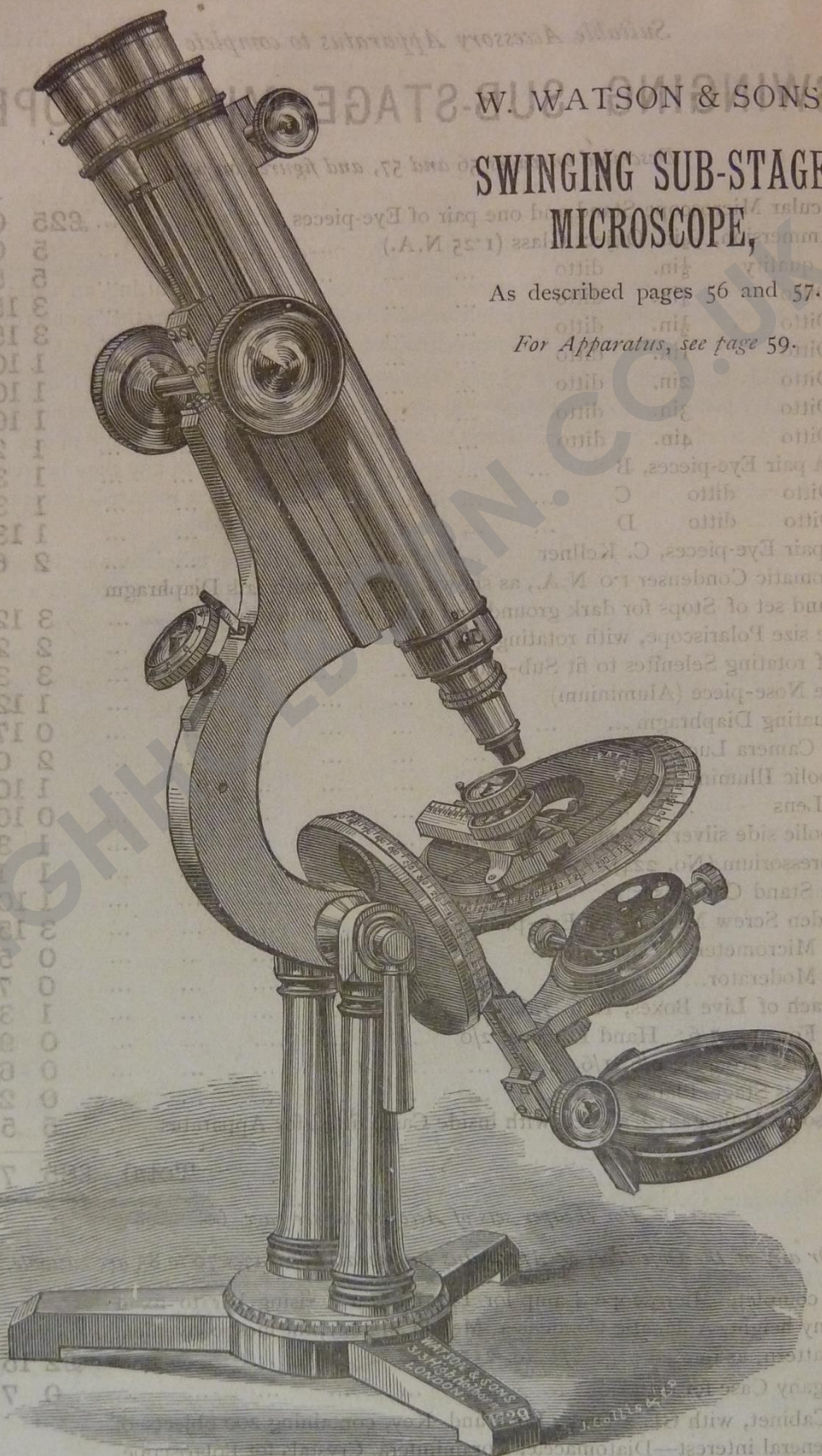
10 0 0

W. WATSON & SONS

SWINGING SUB-STAGE MICROSCOPE,

As described pages 56 and 57.

For Apparatus, see page 59.



Total height of Instrument, placed vertically and racked down, 18 inches.

*Suitable Accessory Apparatus to complete the***SWINGING SUB-STAGE MICROSCOPE,***Described on pages 56 and 57, and figured on page 58.*

Binocular Microscope Stand and one pair of Eye-pieces	...	...	...	£25	0	0
Oil Immersion, 1 $\frac{1}{2}$ in. Object Glass (1.25 N.A.)	...	...	...	5	0	0
First quality $\frac{1}{8}$ in. ditto	...	...	...	5	5	0
Ditto $\frac{1}{4}$ in. ditto	...	...	...	3	15	0
Ditto $\frac{1}{2}$ in. ditto	...	...	...	3	15	0
Ditto 1 in. ditto	...	...	...	1	10	0
Ditto 2 in. ditto	...	...	...	1	10	0
Ditto 3 in. ditto	...	...	...	1	10	0
Ditto 4 in. ditto	...	...	...	1	2	0
Extra pair Eye-pieces, B	...	...	...	1	3	0
Ditto ditto C	...	...	...	1	3	0
Ditto ditto D	...	...	...	1	13	0
One pair Eye-pieces, C. Kellner	...	...	...	2	6	0
Achromatic Condenser 1.0 N.A., as shown, page 76, with Iris Diaphragm and set of Stops for dark ground and oblique illumination	...	...	...	3	12	6
Large size Polariscope, with rotating analyser	...	...	...	2	2	0
Set of rotating Selenites to fit Sub-stage	...	...	...	3	3	0
Triple Nose-piece (Aluminium)	...	...	...	1	12	6
Graduating Diaphragm	...	...	...	0	17	6
Abbe Camera Lucida	...	...	...	2	0	0
Parabolic Illuminator	...	...	...	1	10	0
Spot Lens	...	...	...	0	10	6
Parabolic side silver Reflector	...	...	...	1	3	0
Compressorium (No. 224)	...	...	...	1	1	0
Large Stand Condenser...	...	...	...	1	10	0
Ramsden Screw Micrometer Eye-piece	...	...	...	3	15	0
Stage Micrometer in Case	...	...	...	0	5	0
Light Moderator...	...	...	...	0	7	6
One each of Live Boxes, 10/6, 7/6, 5/6	...	...	...	1	3	6
Stage Forceps, 7/6; Hand Forceps, 2/0	...	...	...	0	9	6
Two Glass Troughs, 4/6, 1/6	...	...	...	0	6	0
Two Glass Stage Plates...	...	...	...	0	2	0
Handsome Mahogany Cabinet, with inside Case, fitted for Apparatus	...	...	...	5	5	0
Total				£85	7	6

*For cheaper sets of Accessories, see page 60.**Or any of the Objectives or Apparatus enumerated on pages 70 to 85 are suitable.*

Most complete Microscope Lamp for Paraffin, on a rising bar to fix at any height, Aplanatic Condenser, Metal Chimney, the most convenient pattern, as quoted page 87, No. 255	...	...	...	£2	15	0
Mahogany Case for ditto	...	...	...	0	7	6
Pine Cabinet, with Glass Door, Lock and Key, containing 200 objects of general interest—Diatomaceæ, Foraminifera, Crystals for Polariscope, Botanical and Entomological Specimens, all of highest quality	...	...	...	14	14	0
Pine Box with Trays, containing six dozen objects as above	...	...	...	5	0	0

SETS OF APPARATUS TO COMPLETE FIRST-CLASS STANDS.

No.	Series,	in.	Object Glass	N.	£	s	d
No. 1	Series,	$\frac{1}{2}$	in. Object Glass	...	5	5	0
Ditto	$\frac{1}{4}$	in.	ditto	...	3	15	0
Ditto	1	in.	ditto	...	1	10	0
Ditto	2	in.	ditto	...	1	10	0
Ditto	3	in.	ditto	...	1	10	0
Ditto	4	in.	ditto	...	1	2	0
Extra pair of Eye-pieces,	B			...	1	3	0
Ditto	ditto	C		...	1	3	0
Ditto	ditto	D		...	1	13	0
Abbe Model Illuminator, complete				...	2	10	0
Large Polariscope	...			...	1	15	0
Best Angular Double Nose-piece (Aluminium)				...	0	17	6
Graduating Diaphragm	...			...	0	17	6
Wollaston's Camera Lucida				...	1	1	0
Parabolic Illuminator	...			...	1	10	0
Best Spot Lens	...			...	0	10	6
Parabolic side silver Reflector	...			...	1	3	0
Large Stand Condenser	...			...	0	15	0
Stage Micrometer	...			...	0	5	0
Light Moderator	...			...	0	7	6
Two Live Boxes, 10/6, 5/6	...			...	0	16	0
Stage Forceps, 7/6; Hand Forceps, 2/0	...			...	0	9	6
Two Glass Troughs, 4/6, 1/6	...			...	0	6	0
Two Glass Stage Plates	...			...	0	2	0
Upright Mahogany Cabinet, with inside fitted drawers for Apparatus, suitable for either "Swinging Sub-stage" or Scientist's Microscope				...	2	10	0
Total					£34	6	6

		O.			
First quality, $\frac{1}{4}$ in. Object Glass, 90°					£2 10 0
Parachromatic, 1in. ditto					1 2 0
Ditto 2in. 15° ditto	1 2 0
Ditto 3in. ditto	1 2 0
Extra pair of Eye-pieces, B	1 3 0
Abbe Model Illuminator, complete	2 10 0
One Eye-piece each, C 11/6, D 16/6	1 8 0
Polariscope Complete	1 5 0
Bent Double Nose-piece	0 15 0
Graduating Diaphragm	0 17 6
Beale's neutral tint Camera Lucida	0 6 0
Parabolic side silver Reflector	1 3 0
Stand Condenser	0 15 0
Live Cage	0 10 6
Stage Forceps, 5/6; Hand Forceps, 2/0	0 7 6
Stage Micrometer, 5/0; Eye-piece Micrometer, 5/0	0 10 0
Two Glass Troughs	0 5 0
Glass Stage Plate	0 1 0
Upright Mahogany Cabinet for Instrument, and fitted for above Apparatus	2 10 0
Total					£20 2 6

W. WATSON & SONS' SCIENTIST'S MICROSCOPE.

THIS Microscope is of the very highest class, and all adjustments are of the most perfect form it is possible to manufacture. Microscopists possessing themselves of one of these Instruments will find in it rigidity, truth of working parts, and combined perfection, in the highest degree, nearly every movement having been specially modelled for the Instrument. It is made by the most skilled workmen, every modern improvement that our long experience approves is embodied in it, and it is altogether a most convenient Instrument for practical research.

It will be noticed that

THE FOOT

is made curving forward at the top. By this arrangement the greatest rigidity is ensured, whether the Instrument be inclined on its axis horizontally, or used vertically, and there is no tendency to unsteadiness in any position. In addition to this there is great convenience for the manipulation of the mirror and Sub-stage, the open space in the bend of the foot giving ample room for this purpose.

THE SUB-STAGE

has screws to centre, and rackwork to focus, and is mounted on an exceedingly solid joint, and made so that it may be completely lifted aside with the apparatus contained in it when direct light from the mirror is required, and replaced. This form of Sub-stage, as made in this Instrument is as *perfectly steady* as the old fixed form, as when in position a lock pin is brought over it which secures it and renders it absolutely rigid. The great saving of time, and convenience of being able to lift the Sub-stage out of the way at once, is apparent to anyone who works with the Microscope. At the same time, if anyone preferred to have the old form of fixed Sub-stage, we should supply it without extra charge.

THE TAILPIECE,

carrying the double mirror, is mounted on a joint to swing aside either for oblique illumination, or when direct light is required on the object.

THE MECHANICAL STAGE

is of very thin but rigid construction, rotating concentrically, and designed expressly for this Microscope. The movements give the utmost smoothness and truth in working and have 1 in. range of motion in each direction. There is also an upper sliding carrier to the stage, moving in dove-tailed grooves. The diameter of the stage is $4\frac{1}{2}$ inches, the central aperture being $1\frac{7}{8}$ in., allowing of the working distance of the objective being felt while focussing.

THE COARSE AND FINE ADJUSTMENTS

are as described pages 3-6, and with the former there is ample range to focus a 4in. objective.

ALL THE MOVEMENTS

are fitted with screws to compensate for wear and tear, as described page 5.

THE BINOCULAR DRAW-TUBES

have rackwork to adjust to width of user's eyes.

The Instrument is finished with bronzed foot and limb, and bright body, stage and milled heads, in very best manner, and has clamping bar for fixing at any angle.



W. WATSON & SONS'
SCIENTIST'S
MICROSCOPE,

As described page 61.

Height, when placed vertically and racked down, 16 inches.

For prices, &c., see page 63.

PRICE LIST.

Binocular Microscope Stand, as figured on page 62, and described page 61, with Sub-stage and one pair of Eye-pieces ...	£17 10 0
Ditto, with highest quality Objectives, rin. 25°, and $\frac{1}{2}$ in. 90° (with adjustment for thickness of covers), and Stand Condenser, in Mahogany Cabinet...	23 0 0
Monocular Microscope Stand, as figured and described, with Sub-stage and one Eye-piece ...	14 15 0
Ditto, fitted with highest quality Objectives, rin. 25°, and $\frac{1}{2}$ in. 90° (with adjustment), Stand Condenser, in Mahogany Cabinet ...	20 5 0

WITH GLASS STAGE.

Binocular Microscope Stand, exactly as described and figured, with Sub-stage, but having, instead of the Mechanical Stage, a very perfect concentric rotating glass Stage, having a Sliding Object Carrier, giving rin. of motion in any direction. This Object Carrier is exceedingly smooth in working, being controlled by Ivory Pins working on glass, with one pair of Eye-pieces ...	16 0 0
Ditto, with Objectives and Stand Condenser as above, in Mahogany Cabinet ...	21 10 0
Monocular Microscope Stand, with Glass Stage as described above, and one Eye-piece ...	13 5 0
Ditto, with Objectives and Stand Condenser as above, in Mahogany Cabinet ...	18 15 0

PRESENTATION FORM.

Binocular Microscope Stand, as figured and described, but having the Mechanical Stage divided to degrees, and finished in best bright polished and lacquered metal throughout. An exceedingly handsome Instrument, with Sub-stage and one pair of Eye-pieces ...	22 0 0
Ditto, fitted with highest quality Objectives, rin. 25°, and $\frac{1}{2}$ in. 90° (with adjustment), and Stand Condenser, in handsome Mahogany Cabinet with inside drawers for apparatus ...	28 5 0
Monocular Microscope Stand, as above, with Sub-stage and one Eye-piece ...	19 5 0
Ditto, fitted with Objectives and Stand Condenser in handsome Mahogany Cabinet as above ...	25 10 0

* If the Sub-stage is not required, the Instrument may be supplied without it, at a reduction from above prices.

EXTRAS.

Mahogany Cabinet for the above Instruments, with fittings for apparatus ...	£1 15 0
Ditto, of very handsome description, having inside drawers for apparatus ...	2 10 0
Fitting Cork Pads to toes of Microscope, at point of contact with table, to prevent scratching ...	0 5 0
Divisions to Stage, reading by verniers to the $\frac{1}{10}$ th of a millimetre ...	1 1 0
Plate to fit in dove-tailed grooves to cover surface of Stage, for rough work ...	0 17 6

SUITABLE APPARATUS TO COMPLETE THE SCIENTIST'S MICROSCOPE.

C.

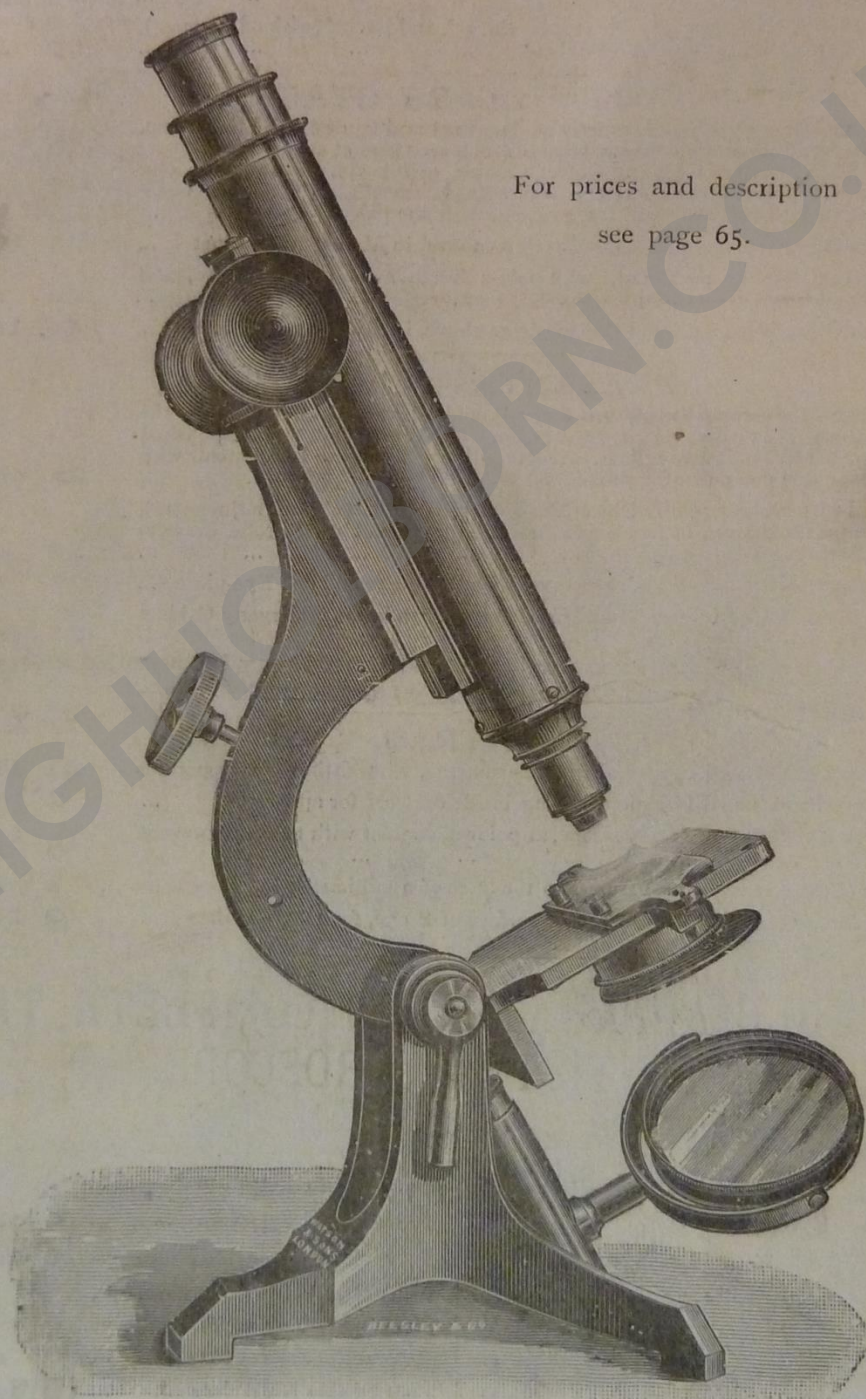
No. 1 Series, 2 in., Object Glass ...	£1 10 0
Ditto $\frac{1}{2}$ in., 140° Object Glass ...	5 5 0
Homog. Imm. 1-12th in., 1'25 N.A. ...	5 0 0
Extra pair of Eye-pieces ...	1 3 0
Large Polariscope ...	1 15 0
Ditto Paraboloid ...	1 10 0
Achromatic Condenser (1'0 N.A.) with set of Stops ...	3 12 6
Aluminium Bent Double Nose-piece ...	0 17 6
Animalculæ Trough & Stage-plate ...	0 2 6
Stage Forceps 5/6; Hand Forceps 2/0 ...	0 7 6
Live Cage ...	0 5 6
Beale's Camera Lucida ...	0 6 0
Total ...	£21 14 6

D.

2 in. Par. achromatic Objective (17") ...	£1 2 0
$\frac{1}{2}$ in. ditto ditto ...	2 0 0
Extra pair of Eye-pieces ...	1 3 0
Polariscope ...	1 5 0
Abbe Model Illuminator, No. 121, complete, with stops ...	2 10 0
Beale's Camera Lucida ...	0 6 0
Bent Double Nose-piece ...	0 15 0
Animalculæ Trough & Stage-plate ...	0 2 6
Total ...	£9 3 6

W. WATSON & SONS'
"RESEARCH" MICROSCOPE.

For prices and description
see page 65.



Height, when placed vertically and racked down, $14\frac{1}{2}$ inches.

W. WATSON & SONS' "RESEARCH" MICROSCOPE.

As figured, page 64.

THIS Instrument is of thoroughly sound but plain construction, and of full size. It is fitted with our **COARSE AND FINE ADJUSTMENTS**, as described pages 3-6, and the former has sufficient range to focus a 4in. objective. The **STAGE** base is fitted with a sliding plate attached to it by springs, and the most exact and precise movement may be effected by means of this in any direction. The **MIRROR** is of large size, plane and concave, and is hung on a jointed arm for swinging aside. A Wheel of Diaphragms is provided, also clamp to joint for fixing the Instrument in any position. For all general purposes this is a thoroughly first-class reliable Instrument, and we strongly recommend it.

PRICES.

MONOCULAR Microscope Stand, as described above, with 1 Eye-piece	£6 10 0
Do. do. fitted with highest quality "Parachromatic" Objectives, 1in., 25°, and $\frac{1}{6}$ in., Stand Condenser, and Mahogany Cabinet	10 5 0
BINOCULAR Microscope Stand, as described above, with 1 pair of Eye-pieces	9 5 0
Do. do. fitted with highest quality "Parachromatic" Objectives, 1in., 25°, and $\frac{1}{6}$ in., Stand Condenser, and Mahogany Cabinet	13 0 0

EXTRAS.

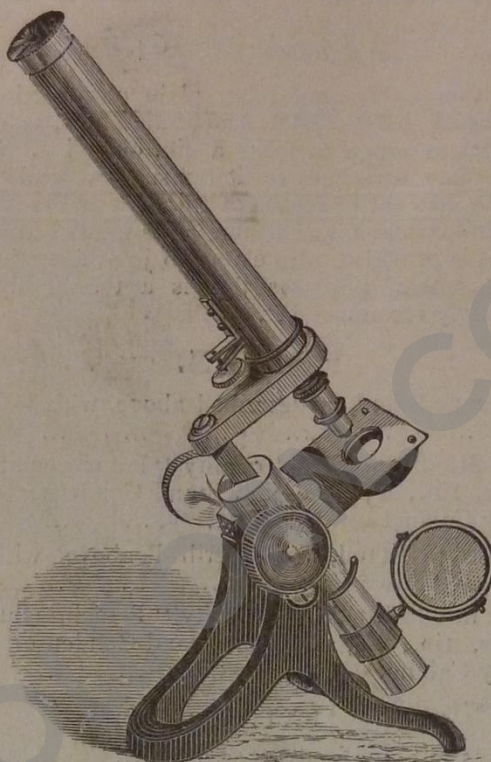
Mechanical movements to Stage	2 10 0
Compound Sub-stage, as fitted to the Edinburgh Student's Microscope, figured page 34	2 2 0
Mahogany Cabinet for either of the above Instruments, with fittings for apparatus	1 10 0
Fitting Cork Pads to toes of Microscope, at point of contact with table, to prevent scratching	0 5 0

ACCESSORY APPARATUS

Suitable for these Microscopes.

Extra Eye-piece, C	£0 11 6
Polariscope	1 5 0
Double Nose-piece, angular form	0 15 0
Beale's neutral tint Camera Lucida	0 6 0
Parabolic side silver Reflector	1 3 0
Polyp Trough	0 4 6
Small Animalculæ Trough	0 1 6
Live Cage	0 5 6
Stage Forceps	0 5 6
Abbe Model Illuminator, as figured page 75, fitted with Iris Diaphragm, No. 123	1 12 6
Box of Stops for dark ground and oblique illumination for do.	0 7 6
	<hr/> £6 17 6 <hr/>

W. WATSON & SONS' EDUCATIONAL MICROSCOPE.



Has rackwork coarse and fine adjustments for focussing, sliding stage, one eye-piece, set of three combining achromatic objectives, $\frac{1}{4}$ in., $\frac{1}{2}$ in. and 1 in., wheel of diaphragms, live cage, forceps, in mahogany case with large drawer underneath for objects, &c. £3 3 0

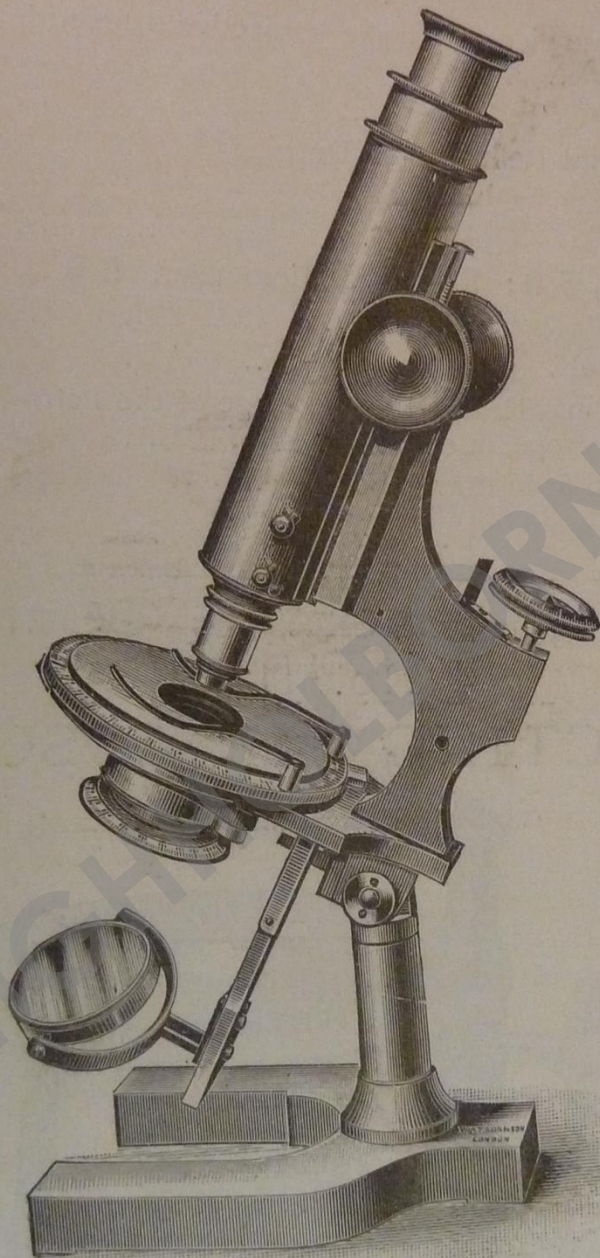
SPECIALITY.—*The above Instrument, fitted with first-class 1 in. and $\frac{1}{4}$ in. objectives, to replace the combining objectives 4 4 0

*Although this Instrument is not fitted with our improved form of Fine Adjustment, and consequently is not so perfect for high power work, yet, when fitted with these special Objectives it will be found very efficient for Students' use.

ADDITIONAL APPARATUS, IF REQUIRED.

Fitting to screw into Stage from under side to carry								
Condenser, Polariscope, &c. ... ..	...	...	...	...	...	0	3	6
Extra Eye-piece ... ..	...	...	...	...	...	0	8	6
Camera Lucida ... ..	...	...	...	...	...	0	6	0
Stand Condenser ... ..	...	...	...	...	...	0	7	6
"Parachromatic" Objective, 2 in., 12° ... ..	...	...	...	...	...	0	16	6
						<hr/> £2 2 0 <hr/>		

W. WATSON & SONS' STUDENT'S PETROLOGICAL MICROSCOPE.



For additional
apparatus,
see page 68.

All the fittings
are of the
universal size.

THE Instrument is of highest quality throughout, and is intended to supply the want on the part of Students for an efficient Instrument for the examination of minerals, &c., at a moderate price. The Stand has all the advantages of our Edinburgh Student's Microscope (see page 25), is fitted with our Improved Form of Fine Adjustment, the milled-head of which is divided to $\frac{1}{100}$ ths, has our best quality spiral rack and pinion concentric rotating glass stage divided to degrees, reading by vernier to 5 minutes; analyser and Klein's quartz plate fitted in the body of the microscope, polarising prism with divided circle, fitting into tube for apparatus beneath the stage, which can be immediately lifted aside and replaced as required; eye-piece, fitted with spider's web cross lines, with 1in. objective, 25° , in mahogany case £10 10 0

Extra for analyser fitted over eye-piece, with divided circle, calcspar plate for stauroscopic examination, condensing lens to top of polariser to show rings in biaxial crystals, &c. £2 15 0

This Microscope may be had on the Tripod form of foot at an extra cost, including case, of £1 2s. 6d.

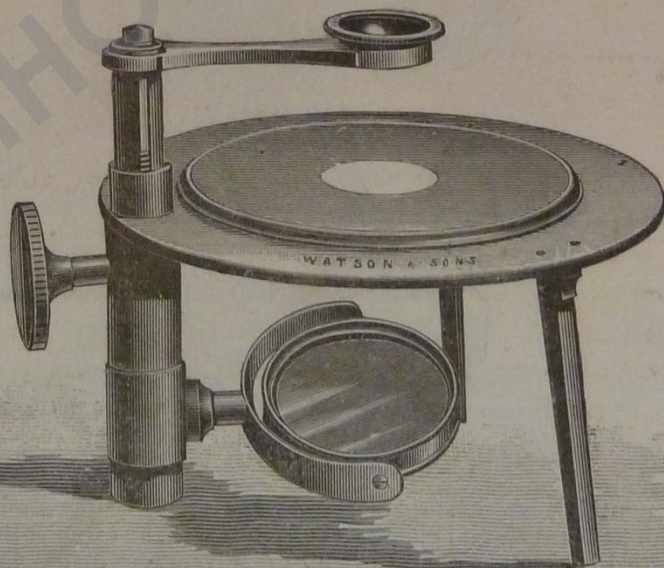
EXTRAS FOR THE STUDENT'S PETROLOGICAL MICROSCOPE.

(Page 67.)

Self-centring Nose-piece to make Objective true with rotating Stage ...	£0 15 0
Extra Eye-piece "C" ...	0 12 6
Beale's Neutral Tint Reflector for Drawing ...	0 6 0
$\frac{1}{2}$ in. "Parachromatic" Objective, 40° ...	1 2 6
$\frac{1}{4}$ in. Ditto Objective ...	1 10 0
Stage Micrometer, 5/0; Eye-piece Micrometer, 5/0 ...	0 10 0
Stand Condenser ...	0 7 6
Double Nose-piece... ..	0 15 0
Centring Screws may be fitted to the Stage of the Petrological Microscope, at an extra cost of ...	2 0 0
Bertrand's Lens to fit in draw-tube ...	0 7 6
Quartz Wedge, unmounted ...	0 18 0

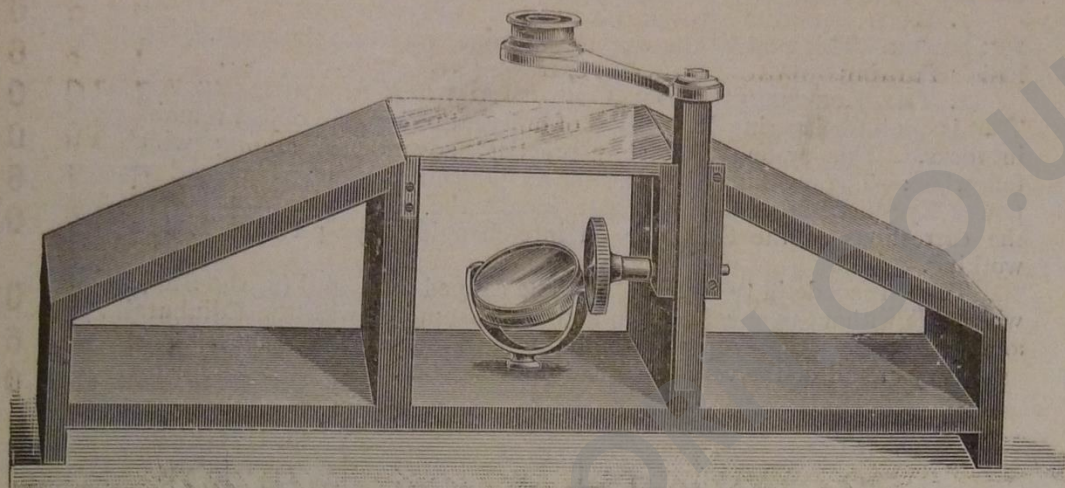
W. WATSON & SONS'

No. 11

DISSECTING MICROSCOPE.

A very steady Form on three feet, with circular glass stage $4\frac{1}{2}$ in. diameter, rackwork focussing movement, three powers, $\frac{1}{4}$ in., $\frac{1}{2}$ in. and 1in., dissecting knives, needles, scissors, forceps, and mahogany case with drawer ...	£2 5 0
Stand to hold Magnifier for Dissecting ...	0 2 6
Magnifier for Dissecting, three Lenses ...	0 4 0

W. WATSON & SONS' No. 12 LABORATORY DISSECTING MICROSCOPE.



This Instrument is constructed of mahogany, and is very strongly built.

The sides slope at the most convenient angle to afford steady support to the hands: the stage is of glass, $4\frac{1}{2}$ in. square, and is removable. Arm to carry Lenses, having Spiral rack and pinion adjustment of best quality, giving long range, double mirrors on gymbal.

Without lenses, price	£2 2 0
Ditto fitted with 1 in., $\frac{1}{2}$ in. and $\frac{1}{4}$ in. lenses	2 10 0
Exactly similar Instrument to above, but with sliding bar, instead of rackwork, to focus	1 7 6
Ditto with 1 in., $\frac{1}{2}$ in. and $\frac{1}{4}$ in. lenses	1 15 6
It is recommended that the new Achromatic Triplet Magnifiers quoted on page 86 be taken: they give a flat field and perfect definition, are arranged to fit into this Instrument, and are made in three powers, giving magnifications respectively of 6, 10 and 20 diameters, price each	0 14 6
Vulcanite Stage Plate, in addition to the glass one quoted above	0 6 6

MICRO-SPECTROSCOPE.

With rack motion to focus, and adjustment for width of slit, shows two spectra in the field of view at the same time, the small prism for the second spectrum can be removed when only one is required, the prisms are also arranged to slide from position at will, leaving the field of view open as an ordinary eye-piece, the stage for holding test-tubes, &c., can be removed with its mirror from the body of the Instrument when not required. It is fitted with a wave length scale which can be reflected into the field of view; in mahogany case ... £6 10 0

EYE-PIECES.

HUYGHENIAN FORM, AS ORDINARILY USED.

WE have entirely revised the whole of these, and the powers have been arranged so as to form the most convenient series for all classes of work. Two special features characterise all our Eye-pieces, which are not usually found in those of other makers:—

1. EACH IS ENGRAVED WITH A FIGURE REPRESENTING ITS INITIAL MAGNIFYING POWER. This enables the worker to at once ascertain the magnifying power that he is employing.

2. THE EYE-PIECES ARE ALL MADE TO WORK IN THE SAME FOCAL PLANE. That is, on interchanging Eye-pieces of different power, the object remains practically in focus. This system has many practical advantages, among which are the following:—The working distance of an Objective is not shortened when a high power Eye-piece is used with it, as is usually the case. No disturbance is caused to the corrections of the Objective on interchanging Eye-pieces. Time is saved in working.

They are made in two series. (1) The capped form, and (2) the Student's Series, which are without removable caps, and are as supplied with the Edinburgh Student's and Histological Microscopes. The latter have nickel plated tubes.

They are all of the very best quality throughout.

PRICE LIST.

= No.	A 1	B 2	C 3	D 4	E 5	F 6
Initial magnifying power	4	6	8	10	12	15 dia- meters.
Price. Best Capped Eye- pieces	11/6	11/6	11/6	16/6	16/6	16/6
Do. Student's Series	7/0	7/0	7/0	7/0	12/6	12/6

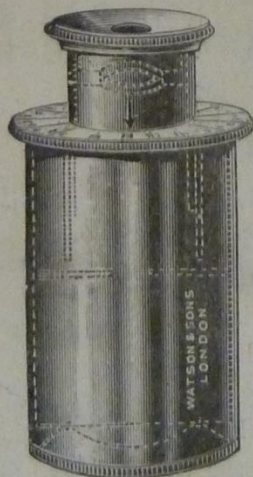
KELLNER EYE-PIECES.

These are Achromatic, and give a very large field. They are most serviceable with low powers, also giving good results in Photography. Price £1 3s. each.

W. WATSON & SONS' PROJECTION EYE-PIECES.

FOR PHOTO-MICROGRAPHY.

These Eye-pieces have been so arranged by us that they may be used advantageously with Objectives of either the Apochromatic or ordinary series (page 72), for photographic purposes, projecting an exquisitely sharp image of the object on the plate. A diaphragm between the lenses limits the field, and a sharp image of it should appear on the screen when the Eye-piece is adjusted. The adjustment may be effected by revolving the Eye-piece cap in a spiral slot so that the Eye or top Lens is either brought closer or removed farther away from the diaphragm as may be required, and divisions and a reader are provided for registering positions. Made to fit any size of body without extra charge.



Initial magnifying powers:—

English length of tube—10in. 3 and 6
Continental do. 6in. 2 and 4

Price £2 each.

Similar Eye-pieces of the same power, by Zeiss or Reichert, each £2.

Adapters between Continental Eye-pieces and any English size, 4/6 each.

OBJECTIVES.

As the result of extended experiment and revision, we are enabled to offer a new Series of Objectives, which we have termed our

“Parachromatic” Series.

In the manufacture of these Lenses the best and most durable kinds of Jena glass are employed, with the result that they are more perfectly corrected both for colour and spherical aberration than the Achromatic Objectives of former years.

It will be observed that the NUMERICAL APERTURES in nearly every case have been LARGELY INCREASED, so that each Objective now possesses a fair ratio of aperture to power. This quality is a most important one, for on it depends the brilliance of image and the ability of the lens to define fine detail.

The utmost care is exercised in their manufacture and adjustment, a most exhaustive system of testing is adopted, ensuring a uniformity of quality to standard excellence. They are made throughout on our own premises, under personal supervision, and we guarantee the performance of each one. We are confident in stating that they are unexcelled by any similar series of Objectives, of either English or Continental manufacture.

Notwithstanding the improvements in working qualities, we have been able, in consequence of the largely increased demand, to so modify our methods of manufacture as to supply them at the EXCEEDINGLY LOW PRICES quoted on page 72.

We may specially refer to our $\frac{1}{4}$ in. and $\frac{1}{2}$ in. “Parachromatic” Objectives. These are the powers that are invariably required by students, and the kindly references to their qualities in numerous text-books, together with the great demand we have experienced for them, testifies to their eminent suitability for the work and the uniformity of their excellence.

Every facility is at all times afforded intending purchasers for testing our Objectives, and we invite comparison and examination.

* * All the above are adjusted on a cover glass .008 in. thick, and work at their best through this thickness of cover. If a thicker or thinner cover be employed, correction may be made by lengthening the microscope tube for the latter, and shortening it for the former.

THE No. 1, or HIGH APERTURE SERIES.

These Objectives are also of the very finest quality, and will be found to fulfil in the most adequate manner all the requirements of the ordinary microscopist. They are of the finest workmanship and have correction collars for thickness of cover glass for the powers from $\frac{1}{2}$ in. upwards. We can strongly recommend them to workers needing Lenses that have very large apertures. In these also the Jena glass is employed, and every effort is made so that each Lens may be of the very finest performance.

All our Objectives are corrected for Photo-Micrography, and special attention has been given to allow as great a working distance as possible.

APOCHROMATIC OBJECTIVES.

We quote on page 73 a list of these Lenses and the necessary Eye-pieces. By a new form of construction the outstanding aberrations are eliminated almost entirely, the numerical apertures are greater, and they are undoubtedly the finest Objectives obtainable. Still, excepting for work of an original character, the Lenses contained in our own series will fulfil every requirement.

Apochromatic and other Objectives of any maker supplied to order at list prices.

SPECIAL NOTE.—When ordering Objectives, it should be stated whether they are required for the Continental or English length of tube. The former is 160 mm/metres = about 6 inches long, and the latter 250 mm/metres or 10 inches long.

W. WATSON & SONS'

NEW PARACHROMATIC SERIES OF OBJECTIVES.

Approximate Focus.	Initial power calculated for an image distance of 10 inches.	Numerical aperture.	Equivalent angular aperture.	Magnifying powers with the various Eye-pieces, Huyghenian. (See page 70.)						PRICE.		
Inches.	Diams.		In air.	A = No. 1	B	C	D	E	F	£	s.	d.
+4	3	0.08	9°	12	18	24	30	36	45	1	2	0
+3	4	0.09	10°	16	24	32	40	48	60	1	2	0
+2	6	0.11	12°	24	36	48	60	72	90	0	16	6
2	6	0.15	17°			Ditto				1	2	0
1	12	0.21	25°	48	72	96	120	144	180	1	2	0
2/3	15	0.28	32°	60	90	120	150	180	225	1	5	0
1/2	20	0.34	40°	80	120	160	200	240	300	1	2	6
1/4	42	0.68	85°	168	252	336	420	504	630	1	5	0
1/6	65	0.87	120°	260	390	520	650	780	975	1	10	0
1/8	83	0.88	123°	332	498	664	830	996	1245	2	0	0
1/9	90	0.90	128°	360	540	720	900	1080	1350	2	5	0
1/10	103	0.87	120°	412	618	824	1030	1236	1545	2	10	0

† These Objectives are supplied with very short mounts, so that they may be used on Students' Microscopes having but a short range of Rackwork.

W. WATSON & SONS'

No. 1, OR HIGH APERTURE SERIES OF OBJECTIVES.

			In glass.									
3	4	0.11	12°	16	24	32	40	48	60	1	10	0
2	6	0.17	20°	24	36	48	60	72	90	1	10	0
1 1/2	8	0.19	22°	32	48	64	80	96	120	1	10	0
1	12	0.26	30°	48	72	96	120	144	180	1	10	0
1/2*	23	0.61	75°	92	138	184	230	276	345	3	15	0
4/10*	30	0.71	90°	120	180	240	300	360	450	3	15	0
1/4*	46	0.77	100°	184	276	368	460	552	690	3	15	0
1/4*	46	0.71	90°			Ditto				2	10	0
1/8*	83	0.94	140°	332	498	664	830	996	1245	5	5	0

Water Immersion Objective:

			In air.									
1/10*	100	1.0	180°	400	600	800	1000	1200	1500	4	0	0

Lenses marked thus * have a correction collar for covered and uncovered objects.

Homogenous Immersion Objectives: *The prices include a supply of Immersion Oil.* (These are exceptionally fine Lenses.)

1/8	82	1.20 N.A.	328	492	656	820	984	1230	4	15	0
1/12	125	1.25 N.A.	500	750	1000	1250	1500	1875	5	0	0

All the above magnifications are calculated for a ten inch tube length. If a shorter or longer tube be used the magnification can be ascertained by making 10 the denominator, and the tube length employed the numerator, and multiplying the above figures by this fraction. Thus, to ascertain the magnification at 6 inches of a 1/10 Objective and "B" Eye-piece, the following would be the method: $390 \times \frac{6}{10} = 234$.

The magnification obtainable with any Eye-piece and Objective can be known by multiplying the initial powers. Thus, a 1/10 in. has an initial power of 83; used with a "B" Eye-piece, the initial power of which is 6; the magnification is $83 \times 6 = 498$.

APOCHROMATIC OBJECTIVES.

BY CARL ZEISS, JENA.

REVISED PRICES.

FOCUS.		Initial power. Diameters.	Numerical aperture.	PRICE.		FOCUS.		Initial power. Diameters.	Numerical aperture.	PRICE.	
M/ms.	Inches.			£	s. d.	M/ms.	Inches.			£	s. d.
70	2 ³ / ₄	For projection without Eye-piece		2	0 0		Water	Immersion			
35	1 ¹ / ₂	Ditto		1	15 0						
*24	1	10 ¹ / ₂	0.30	6	0 0	2.50	1 ¹ / ₁₀	100	1.25	12	10 0
16	2 ³ / ₈	15 ¹ / ₂	0.30	4	0 0	3	1 ¹ / ₈	83	1.30	15	0 0
*12	1 ¹ / ₂	21	0.65	7	0 0	3	1 ¹ / ₈	83	1.40	20	0 0
8	1 ¹ / ₂	31	0.65	5	0 0	2	1 ¹ / ₂	125	1.30	15	0 0
*6	1 ¹ / ₂	42	0.95	9	0 0	2	1 ¹ / ₂	125	1.40	20	0 0
4	1 ¹ / ₂	63	0.95	7	0 0	1.5	1 ¹ / ₂	167	1.30	17	10 0
3	1 ¹ / ₂	83	0.95	8	0 0						

* These three Lenses are supplied for the English length of Tube (10 inches) only, all others may be had for either Continental or English length. This should be specified when ordering.

COMPENSATING EYE-PIECES.

BY CARL ZEISS, JENA.

These Eye-pieces are designed primarily for use with the Apochromatic Objectives. Owing to the form of construction of Objectives having a large aperture, it is impossible in the Objective itself to remove all colour, especially on the margin of the field. These Eye-pieces have corrections of the opposite kind to that of the Objectives, that is, the Objective is under-corrected and the Eye-pieces over-corrected, so producing in combination a well-balanced image. They will also be found advantageous with Objectives of the ordinary series from $\frac{1}{4}$ in. of large aperture, upwards.

Initial magnifying power, diams.	1	2	4	6	8	12	18	27
For Continental length of body	£ s. d. 1 0 0	£ s. d. 1 0 0	£ s. d. 1 0 0	£ s. d. 1 0 0	£ s. d. 1 10 0	£ s. d. 1 10 0	£ s. d. 1 5 0	Not supplied.
For English ditto	Not supplied.	1 5 0	1 5 0	Not supplied.	1 15 0	1 10 0	1 10 0	1 5 0

The Compensating Eye-pieces for the Continental length of body have a diameter of 0.92, the size for our Student's Microscope. Those for the 10in. tube are supplied by Messrs. Zeiss to us of the size to fit our large size tube—1.35in.—but other sizes can be made to order, or an adapter supplied to enable the Eye-pieces to be employed. The cost of the latter is 4s. 6d.

APOCHROMATIC OBJECTIVES & COMPENSATING EYE-PIECES.

BY POWELL & LEALAND.

OBJECTIVES.		PRICE.	
Approximate Focus.	Numerical aperture.	£	s. d.
$\frac{1}{2}$ in. ...	0.64 ...	10	0 0
$\frac{1}{4}$ " ...	0.95 ...	9	0 0
$\frac{1}{8}$ " ...	0.98 ...	8	0 0
Homogeneous Immersion:			
† $\frac{1}{2}$ in. ...	1.40 ...	10	0 0
Do. with correction collar		11	10 0
$\frac{1}{4}$ in. ...	1.40 ...	35	0 0
$\frac{1}{8}$ " ...	1.35 ...	50	0 0

EYE-PIECES.					
Foci ...	2in.	1 ¹ / ₂ in.	1in.	$\frac{1}{2}$ in.	$\frac{3}{8}$ in.
= Initial power of	5	7 ¹ / ₂	10	20	27 diam.
Price ...	£2 each.				

† A supply of Oil is included with all Immersion Objectives, with the exception of this one, the cost in this case being extra 3/6.

Immersion Oil in Capped Bottle with dipper, 3/0.

SELECTED OBJECTIVES BY VARIOUS MAKERS.

We have included in the following list the best Objectives contained in the lists of various well-known Opticians. These and many others are ordinarily kept in stock by us, or can be supplied very promptly to order at the makers' list prices. All of them have the universal size of threads.

SELECTED OBJECTIVES

BY CARL ZEISS, JENA.

Designation.	Numerical Aperture.	Approximate Focus.	PRICE.	
aa ...	0.17	1 in.	£ 1 7 0	
A ...	0.30	$\frac{3}{4}$ "	1 4 0	With correction collar.
D ...	0.65	$\frac{1}{6}$ "	2 2 0	
DD ...	0.85	$\frac{1}{6}$ "	2 14 0	£3 14 0
E ...	0.85	$\frac{1}{9}$ "	3 6 0	4 6 0
Homogeneous Immersion—				
— ...	1.25	$\frac{1}{12}$ "	8 0 0	

SELECTED OBJECTIVES

BY E. LEITZ, WETZLAR.

No. 2 ...	0.14	1 in.	0 15 0
„ 3 ...	0.28	$\frac{3}{4}$ "	0 15 0
„ 6 ...	0.82	$\frac{1}{6}$ "	1 10 0
Pantochromatic—			
P 7 ...	0.75	$\frac{1}{4}$ "	2 5 0
Homogeneous Immersion—			
— ...	1.30	$\frac{1}{12}$ "	5 0 0

All the above Objectives may be had corrected for either the 6in. or 10in. tube length.

SELECTED OBJECTIVES

BY C. REICHERT, VIENNA.

No. 6 ...	0.77	$\frac{1}{5}$ "	1 10 0
„ 7a ...	0.82	$\frac{1}{6}$ "	1 16 0
“Halb-Apochromatic”—			
— ...	0.50	$\frac{1}{3}$ in.	1 12 0
Homogeneous Immersion—			
No. 17 ...	1.30–1.35	$\frac{1}{6}$ "	8 0 0
„ 18b ...	1.20–1.25	$\frac{1}{12}$ "	5 0 0

APOCHROMATIC OBJECTIVES & COMPENSATING EYE-PIECES

BY C. REICHERT, VIENNA.

FOCUS.		Initial power.	Numerical aperture.	PRICE.		Initial magnifying power, diams.			2			4			6		
M/ms.	Inches.					PRICE ...			£	s.	d.	£	s.	d.	£	s.	d.
16	$\frac{2}{3}$	15 $\frac{1}{2}$	0.30	£4	0 0	Initial magnifying power, diams.			0	16	0	0	16	0	0	16	0
4	$\frac{1}{6}$	63	0.95	8	0 0	PRICE ...			0	16	0	0	16	0	0	16	0
2	$\frac{1}{12}$	125	1.30	16	0 0	Initial magnifying power, diams.			0	16	0	0	16	0	0	16	0
2	$\frac{1}{12}$	125	1.40	20	0 0	PRICE ...			0	16	0	0	16	0	0	16	0

The above Lenses by Reichert are corrected for Continental length of Tube. If desired for the English length an extra 10% is charged.

ADAPTER between the above Eye-pieces and any English size ... 4s. 6d.

APPARATUS FOR MICROSCOPES.

THE following accessories will fit any of the Instruments quoted in this Catalogue or by other modern makers, being of the universal size.

ILLUMINATING APPARATUS.

A Sub-stage Illuminator, or Condenser, is recognised as an absolutely essential part of a modern Microscope, and on it depends the full development of the working qualities of the Objective. Without it the effects obtainable are very mediocre. We manufacture several different kinds, suitable for every description of work, as follows:—

THE ABBE MODEL ILLUMINATOR.

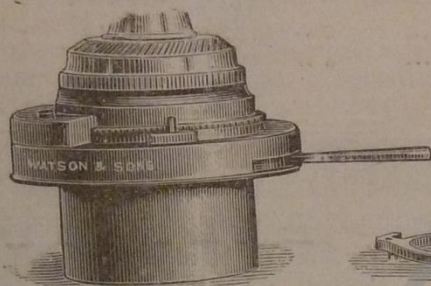


Fig. 1.

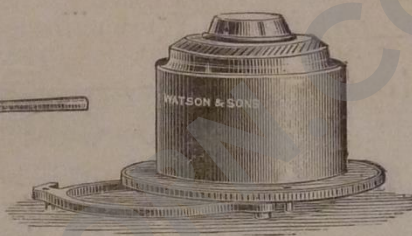


Fig. 2.

This form of Condenser is the most popular form in use; it is preferred before all others for Histological and Bacteriological work, while the amateur will find in it a valuable and convenient illuminator for all purposes. Owing to the large aperture of the cone of light which it projects, it can be employed with the highest powers, and by removing the top lens it can be used with the lowest powers. Dark ground illumination may be obtained with it up to a $\frac{1}{4}$ in. Objective. The Lenses are mounted in Aluminium bronzed, weight thereby being reduced considerably.

It is made in two forms of 1.2 and 1.4 numerical aperture.

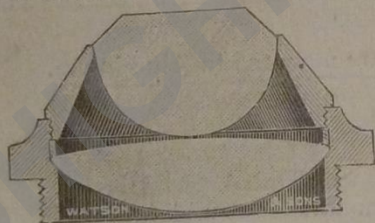


Fig. 3.

OPTICAL PART OF ABBE ILLUMINATOR,
1.2 N.A.

The Lenses are mounted in Aluminium.

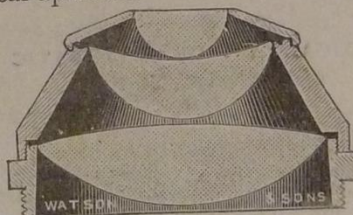


Fig. 4.

OPTICAL PART OF ABBE ILLUMINATOR,
1.4 N.A.

The Lenses are mounted in Aluminium.

The former is in most general demand, but for workers with the highest powers the latter is advantageous, as it will give the most oblique illumination with Objectives of largest aperture. It will be found to give first-rate results in Photo-Micrography.

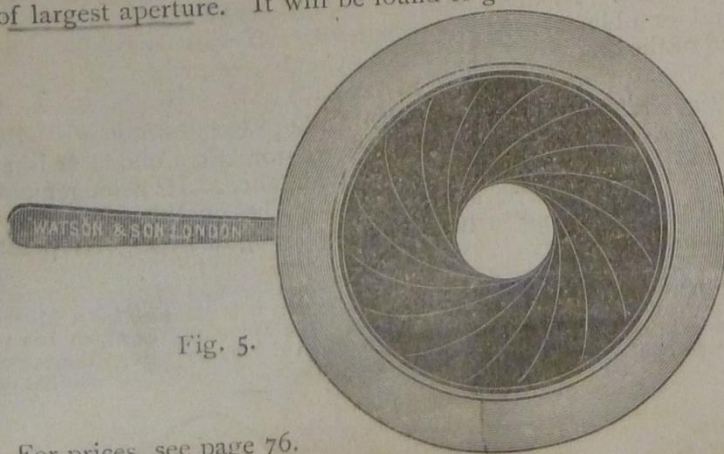


Fig. 5.

We have adapted a very perfect Iris Diaphragm to the fittings of these Condensers (as per Fig. 5) which permits of the most precise gradation of illumination being immediately obtained.

PRICES OF THE ABBE MODEL ILLUMINATOR.

*FOR SUB-STAGE (mounted as Fig. 1, page 75)—

121. 1.2 Abbe Illuminator, with very perfect Iris Diaphragm (Fig. 5) giving any desired aperture, rotating fitting on swinging arm to carry stops. Lenses mounted in Aluminium ... £2 2 6

*FOR UNDER-STAGE (mounted as Fig. 2)—

122. 1.2 Abbe Illuminator, with five central light stops, to fit in carrier on swinging arm. Lenses mounted in Aluminium ... 1 5 0
 123. Do. do. with perfected Iris Diaphragm (Fig. 5) to replace stops. Lenses mounted in Aluminium... 1 12 6
 124. 1.4 N.A. Either of the above fitted with optical part 1.4 N.A., instead of 1.2 N.A., extra ... 0 7 6
 125. Set of stops for either of the above, for dark ground and oblique illumination, in brass box... 0 7 6
 126. Disc of Blue or Yellow Glass, also Ground Glass for above, each 0 1 6

OPTICAL PARTS ONLY, to interchange in the fittings, mounted in Aluminium—

127. 1.2 N.A. 17/6 (Fig. 3). 128. 1.4 N.A., 25/0 (Fig. 4).

ACHROMATIC CONDENSER 1.0 N.A.

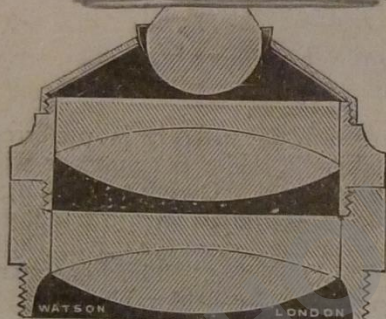


Fig. 6.

OPTICAL PART OF ACHROMATIC
CONDENSER 1.0 N.A.

This is specially designed for use in Photo-Micrography, but it is also very efficient for visual work. It will do all the work of the Abbe Illuminator, and transmits a much larger aplanatic cone of light. It is strongly recommended where critical photographic work is to be done. It may be used with the highest power Objectives, and by removing the top Lens it can be used with the lowest powers. Having Lenses of large size it is exceedingly convenient to use and it may be considered as the best all-round Condenser extant.

The new Schott glass is employed in its construction.

The Lenses are mounted in Aluminium.

PRICES.

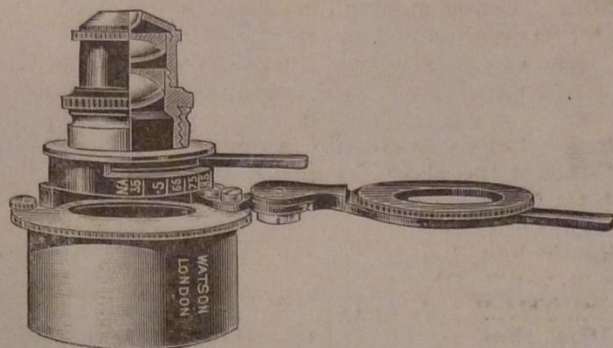
129. For either Sub-stage or Under-stage Instruments, fitted with Iris Diaphragm as Fig. 5, page 75. Lenses mounted in Aluminium £3 5 0
 130. Set of Stops for dark ground and oblique illumination, in brass box 0 7 6
 131. OPTICAL PART only, to interchange in same fittings as the Abbe Model Illuminator. Lenses mounted in Aluminium ... 2 5 0
 132. SPECIAL CARRIER, as designed by Dr. Van Heurck, for either of the above Condensers. It consists of a plate sliding in dove-tailed grooves between the Iris Diaphragm and the Lens, carrying in the centre a ring rotating on its axis and taking the Diaphragms. By this means all the different lights possible, central or oblique, can be obtained. If this is required instead of the ordinary mount for the Condensers, add to above prices ... 1 1 0

Extract from a letter received from Dr. A. C. Stokes, late Editor of "The Microscope," Trenton, New Jersey, U.S.A: "Your Achromatic Condenser is an exceedingly fine thing, and one which improves on acquaintance. Its arrangements for oblique light are especially effective and pleasing. The quality of its axial illumination is such that it leaves nothing to be desired, bringing out the good points of the Objectives in a beautiful way."

* It must be understood that the fitting "for Sub-stage" implies that it is intended for a Microscope having a Compound Sub-stage with screws for centring, and the apparatus for which has to be inserted from the upper side, in contradistinction to a tube fixed in the under part of the stage, which would take the "under-stage" fittings. The Microscope (page 11) has a Sub-stage, that on page 32 an Under-stage.

W. WATSON & SONS'

NEW "PARACHROMATIC" CONDENSER 1.0 N.A.



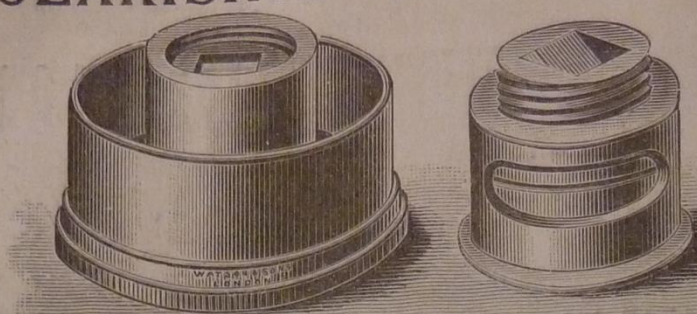
This Achromatic Condenser is specially designed for work with high power Objectives of large aperture, and is of higher magnifying power than either of those previously quoted. Its total aperture is 1.0, and its Aplanatic Aperture exceeds .90 N.A. Its power is $\frac{2}{7}$ in.; the top lens is made removable for working with low power Objectives and the power is then $\frac{1}{10}$ in. The optical portion has the "Universal" Objective Thread, and is mounted over an Iris Diaphragm, beneath which is a revolving carrier for Stops for dark ground and oblique illumination. This latter is provided with an arrangement for centring by means of a cam and slots, to enable the Condenser to be used for experimental work. The Iris Diaphragm is divided so as to indicate the N.A., at which the Condenser is being employed. The diameter of the back lens is specially large for such a Condenser, viz., $\frac{5}{8}$ in. It will be seen from the foregoing description, that this Condenser is eminently suited for the highest class of critical and photographic work, and we confidently recommend it.

- | | | |
|------|--|---------|
| 133. | Price, completely mounted, as figured, with set of Stops for dark ground and oblique illumination | £3 15 0 |
| 134. | Optical part only | 2 5 0 |
| 135. | Disc of Blue or Yellow Glass for above | 0 1 0 |

POWELL & LEALAND'S

APOCHROMATIC CONDENSERS.

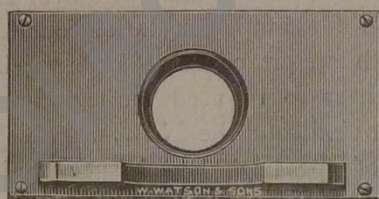
- | | | | |
|-------|---|--|---------|
| 136. | Apochromatic Oil Immersion Condenser 1.4 N.A., mounted in P. & L.'s Special Carrier, with Stops complete | | £12 0 0 |
| 137. | *Apochromatic Dry Condenser 1.0 N.A., Optical part only | | 6 0 0 |
| 138. | Ditto, completely mounted by Powell & Lealand... .. | | 9 0 0 |
| | *We can supply a Carrier similar to that fitted to our Parachromatic Condenser, above, at a cost of £1 15s., including the set of Stops. | | |
| 138A. | Gifford's Malachite Green and Picric Acid Screen, the best light Filter, and approximately Monochromatic, to go into Stop Carrier of Condenser | | 0 4 6 |



139.	Complete Polarising Apparatus with Selenite	£	s.	d.	144.	Very large Nicol Prism, with Rotating Analyser	£	s.	d.
140.	Larger Prisms, complete with Selenite	0	17	6	145.	Analyser to fit over Capped Eye-piece	3	15	0
141.	Extra large Prisms ditto ditto	1	5	0	146.	Ditto fitted to Body of Microscope	1	0	0
142.	Ditto ditto and Rotating Analyser	1	15	0	147.	Polariser fitted with adapter to work in conjunction with Abbe Illuminator, for Sub-stage, extra	1	10	0
143.	Very large Nicol Prism, mounted as Polariser (without Analyser)	2	2	0			0	2	6

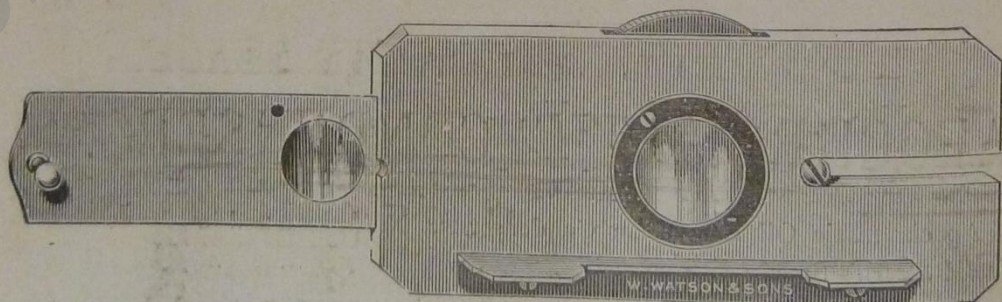
W. WATSON & SONS hold a stock of specially fine and extra large Polarising Prisms. Quotations for any size will be given on application.

SELENITES FOR USE WITH THE POLARISCOPE.



No. 150.

150. **SELENITE STAGE**, as figured, having pinion to rotate central well in which Selenites are carried. With set of 3 Darker's best Selenites having P/A marked on each, complete ... £2 2 0
151. Set of Darker's best Rotating Selenites for Sub-stage, fitting each into a separate revolving ring so that all three can be rotated over one another independently or in combination: each ring is made to turn out of the axis when not required. This may be fitted either to the Sub-stage or to the Polariser ... £3 3 0



MICA SELENITE STAGE.
No. 152.

152. **MICA SELENITE STAGE** as figured. A film of Mica is mounted in a revolving disc fitted in a brass plate, on which the object is placed. Beneath the Mica there is a sliding carrier, containing three different Selenites, so that each one may be brought under the Mica, and the latter rotated. By this means the entire series of colours obtainable with any number of Selenite films, either separately or in combination may be produced. It can be used on any Microscope, and the effects are very fine
153. Selenites mounted on 3 by 1 slips, 3 varieties ... each £1 6 0
154. Selenite films, according to size, mounted in circles ... 2s. to 0 2 0
155. Mica films ditto ditto ... 2s. to 0 10 6

SIDE SILVER REFLECTOR.

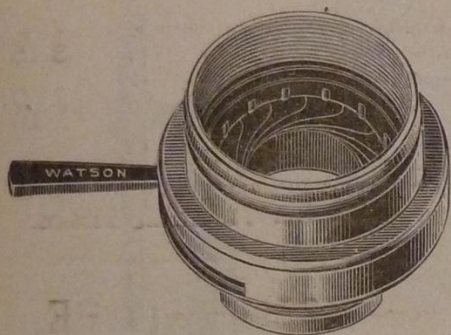


156. This gives beautiful illumination for opaque objects, the light being thrown on to it by the Bull's Eye Condenser and then reflected on to the object. Price, to attach to limb or stage of Microscope, with ball and socket joints, as figured

£1 3 0

157. Ditto, ditto, to attach to nose-piece of Microscope ... 1 5 0

NOSE-PIECE IRIS DIAPHRAGM OR DAVIS'S SHUTTER.



158. This Iris Diaphragm gives a clear aperture equal in diameter to that of the back lens of any Objective, while the collar in which the leaves work is exceedingly compact. It is specially useful for moderating the Apertures of Objectives for producing dark ground illumination, and for increasing penetration. So that the handle of the Iris Diaphragm may be readily set at the most convenient position, the thread that screws into the Microscope is made to revolve very stiffly.

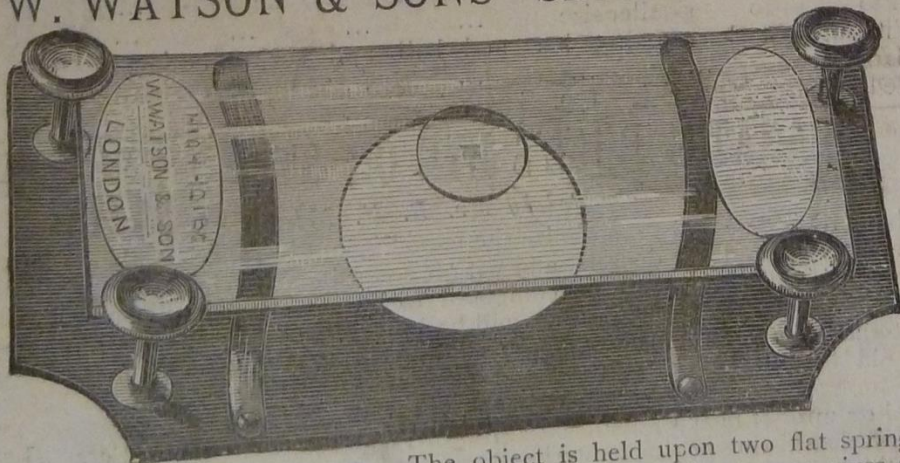
Price 15s.

159. Ditto ditto with fitting to go into Sub-stage, so that Objectives may be used as Condensers ... £0 17 6

SUNDRY ILLUMINATING APPARATUS.

- | | | |
|------|---|--------------------------|
| 160. | Paraboloid for dark ground illumination, largest size | ... £1 10 0 |
| 161. | Ditto, small size for Instruments without a Sub-stage | ... 1 1 0 |
| 162. | Spot Lens ditto ditto | ... 0 7 6 |
| 163. | Ditto in Sliding Mount | ... 0 10 6 |
| 164. | Iris graduating Diaphragm, Watson's improved, for Sub-stage or Under-stage | ... 0 17 6 |
| | ... 4s. 6d. and | ... 0 7 6 |
| 165. | Light Moderators | ... 0 4 6 |
| 166. | Fitting with screw to take Objective for use as Condenser | ... 0 16 6 |
| 167. | Student's Achromatic Condenser | ... 0 5 0 |
| 168. | Hemispherical Lens , for attaching to slide | ... |
| 169. | Webster's Achromatic Condensers , for low and medium powers | £2 10s. Od. to ... 5 5 0 |

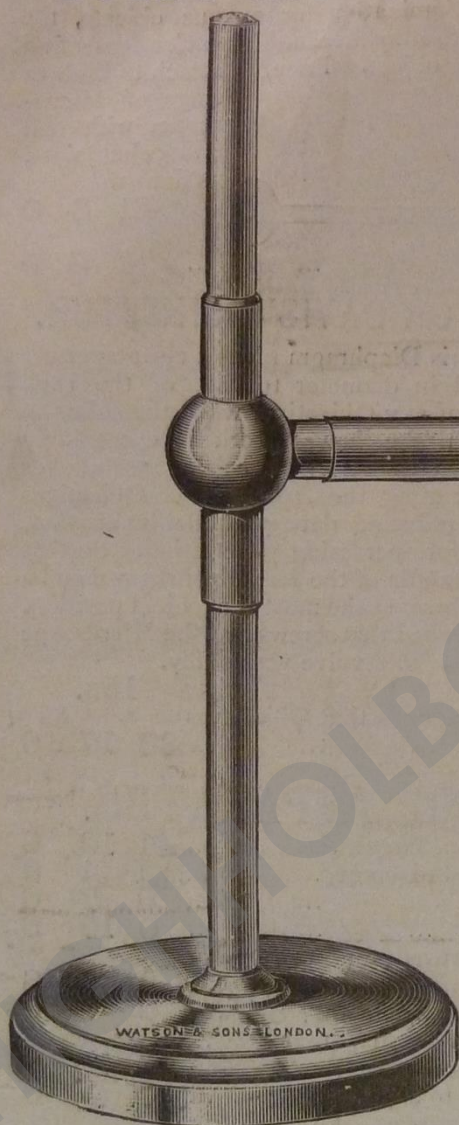
W. WATSON & SONS' SAFETY STAGE.



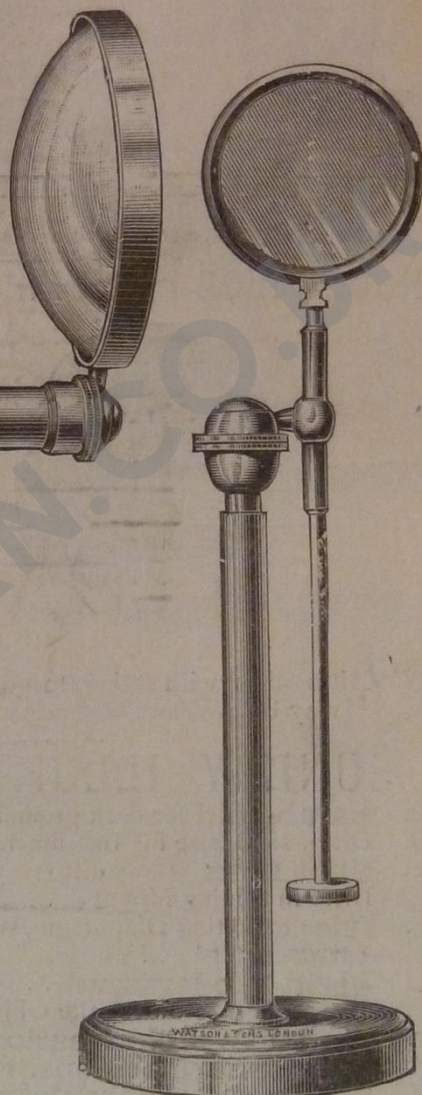
170. For use with high powers. The object is held upon two flat springs, and should it accidentally be touched by the objective, it at once gives way on them. The base is vulcanite and it is a very light piece of apparatus

£0 7 6

BULL'S EYE OR STAND CONDENSERS.



No. 175.



No. 177.

- | | | | | |
|---|-----------------|-----|----|-----|
| 175. Stand Condenser, as figured, largest size, with sliding upright and horizontal bars and ball and socket motion to Lens | ... | £1 | 10 | 0 |
| 176. Ditto ditto smaller size | ... | 1 | 5 | 0 |
| 177. With upright lengthening bar and ball and socket motions, large size | ... | 0 | 15 | 0 |
| 178. Medium size, 10s 6d. | 179. Small size | ... | 0 | 7 6 |

NEW APLANATIC BULL'S EYE OR STAND CONDENSER

(As suggested by Mr. E. M. Nelson).

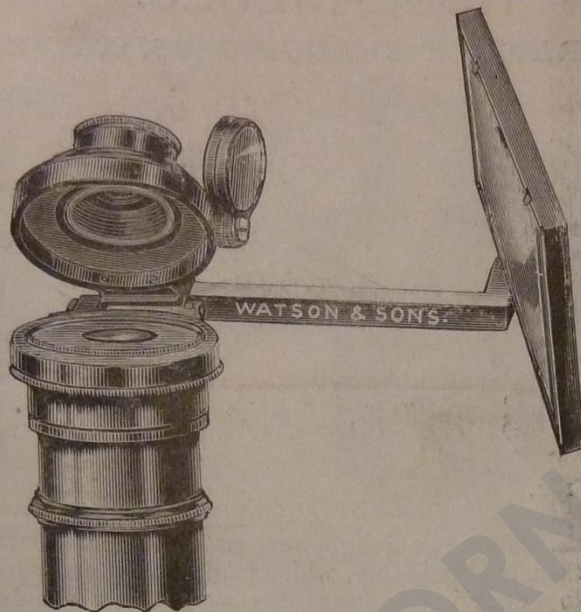
180. This form is designed to minimise the large amount of spherical aberration given by the ordinary Stand Condensers, and with it a considerably increased brilliance of illumination is obtainable. It is composed of two Lenses. Its use is specially indicated in photographic work, and it will be found to not only shorten the exposure, but materially improve the image. For ordinary work also it is much superior to the old form.

Price, mounted as in No. 177, £1 10s.

Mounted on upright heavy Stand, with Lengthening Bar and Clamp Screw, Lenses fitting in ring having centring screws, for Photography, &c., £3.

180A. Ditto with Iris Diaphragm ... extra £1 5 0

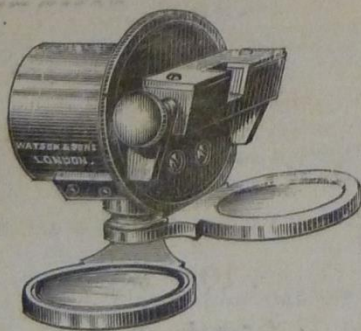
CAMERA LUCIDAS FOR DRAWING.



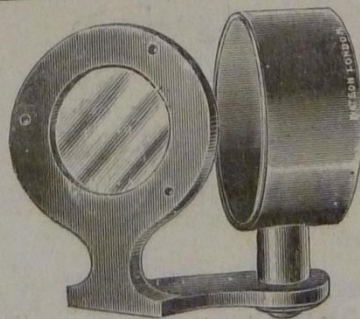
181. The Abbe Model Camera Lucida in Aluminium.

181. This form of apparatus for drawing is considered the best and the most easily used, giving very satisfactory results. Instead of the image being traced by projection on paper, the reverse is the case, and the paper and pencil is projected into the field of view. The mirror reflects the paper on to the silvered surface of a prism placed over the Eye Lens of the Eye-piece of the Microscope, and it is thereby conveyed to the Eye. There is a central opening in the silvering through which the usual Microscopic vision can be obtained. We mount this apparatus in a new manner by means of a cloth-lined adapter, fitting over the outside of the Microscope tube : this saves all trouble in centring and ensures concentricity ; where the Instrument has capped Eye-pieces, the Camera Lucida must be adapted to the Eye-piece, the cap being removed. The apparatus may be disconnected from the fitting adapter by means of a sliding pin and readily replaced, or can be lifted over out of the way as shown in the drawing if desired. Being made almost entirely in aluminium it is very much lighter than any other apparatus of the same kind, and does not cause vibration. It can be used with the Microscope **at any angle**, the only necessity being that the paper on which the sketch is made should be at the same angle as the Instrument. The mirror is parallel worked of best quality to prevent distortion of the image, and two neutral tint shades are provided. Price in case £2 0 0

NOTE.—In order that this may fit perfectly, the Eye-piece (if a capped one) and draw-tube should be sent to us to adapt to. It works best with low power Eye-pieces.



No. 182.

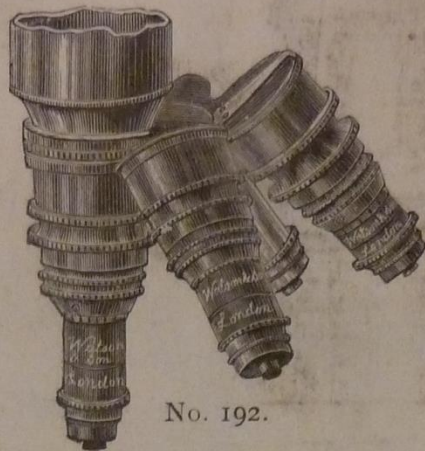


No. 183.

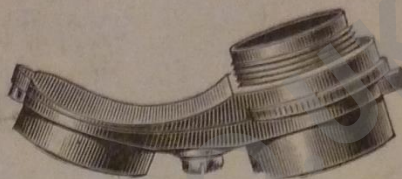
- | | | |
|--|-----|--------|
| 182. Wollaston's Camera Lucida with shades, as figured | ... | £1 1 0 |
| 183. Beale's neutral tint Reflector, very efficient | ... | 0 6 0 |

NOSE-PIECES.

FOR RAPIDLY CHANGING OBJECTIVES.



No. 192.



No. 186.

These Nose-pieces are of new design, very compact, and guaranteed perfectly true. We now make them in Aluminium, which is alloyed in order to render it tough and strong. This alloy does not increase the weight and stands wear and tear perfectly.

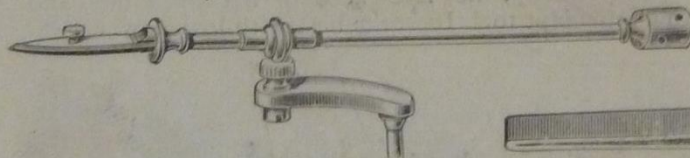
PRICES.

		Brass, Black Bronzed and Lacquered.			Bright Brass, Polished and Lacquered.			Aluminium.				
		£	s.	d.	£	s.	d.	£	s.	d.		
186.	For Two Lenses ...	0	15	0	187.	0	17	6	188.	0	17	6
189.	„ Three „ ...	1	7	6	190.	1	12	6	191.	1	12	6
192.	„ Four „ ...	2	0	0	193.	2	10	0	194.	2	15	0
195.	*Special Double Nose-piece for Instruments with sliding body ... 0 10 6											

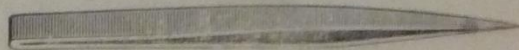
*These are unsuitable for Microscopes which have a rackwork coarse adjustment.

197. **THE FIXED DOUBLE NOSE-PIECE** as made by W. WATSON & SONS to the instructions of Mr. E. M. Nelson, and described in the Royal Microscopical Journal, page 236, April, 1893. This is made as part of the Nose-piece of the Microscope and is a fixture. The object of this is to save the extra length of body caused by the thickness of the ordinary Nose-piece by which the performance of an Objective is sometimes depreciated. It may be fitted to any of our new Instruments at the price quoted for Nose-pieces above, or to any existing Microscope at the cost of the Nose-piece selected, plus 3/6 for fitting.

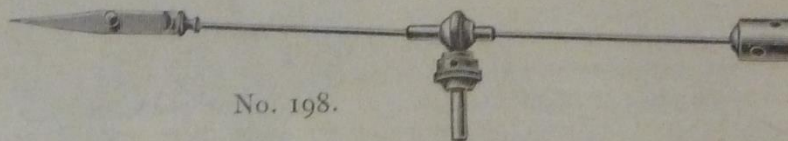
STAGE AND HAND FORCEPS.



No. 199.



No. 200.



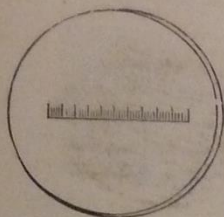
No. 198.

- | | | | | | |
|------|--|-------------|---|----|----|
| 198. | Forceps to fit into Stage or Limb of Instrument to hold objects during examination ... | 5s. 6d. and | £ | s. | d. |
| 199. | Ditto, ditto, best quality ... | ... | 0 | 7 | 6 |
| 200. | Brass hand Forceps, Straight—Small, 9d.; Best, 1s. 6d.; Curved | ... | 0 | 10 | 6 |
| | | | 0 | 2 | 0 |

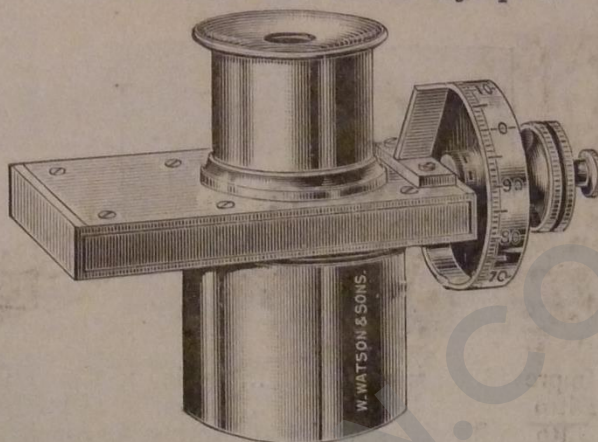
MICROMETERS.

Ramsden Screw Micrometer Eye-piece.

Micrometer to drop
into Eye-piece.



No. 204.



No. 201.

RAMSDEN SCREW MICROMETER EYE-PIECE.

201. This is constructed almost entirely of Aluminium, and thereby overcomes the vibration that was experienced with the heavy one made in brass. The teeth are cut to 100ths, and the drum gives the fractional space between the teeth to $\frac{1}{100}$ ths. It therefore can be read to the $\frac{1}{10000}$ th of an inch. The fixed wire is set a little to the side of the field as recommended by Dr. Dallinger. Price, fitted with Huyghenian Eye-piece, of very best and most accurate construction £3 15 0

The above can also be made to take the $\times 8$ Zeiss Compensating Eye-piece, if desired, at the same cost. The Eye-piece is not then included.

202.	Micrometers for Stage, ruled $\frac{1}{100}$ and $\frac{1}{1000}$ of inch	...	...	0	5	0
203.	Ditto ditto $\frac{1}{10}$ and $\frac{1}{100}$ of millimetre	...	...	0	5	0
204.	Ditto to drop in Eye-piece, as figured ..	...	...	0	5	0
205.	Ditto ditto ruled in squares	...	...	0	5	0
206.	Ditto for Eye-piece with Jackson's adjusting Screw (the Eye-piece requires to be cut for this to be fitted)	...	...	0	17	6
	Cutting Eye-piece for ditto	...	...	0	5	0
207.	Ditto ditto ditto with best capped Eye-piece	1	15	0

MALTWOOD'S FINDER.

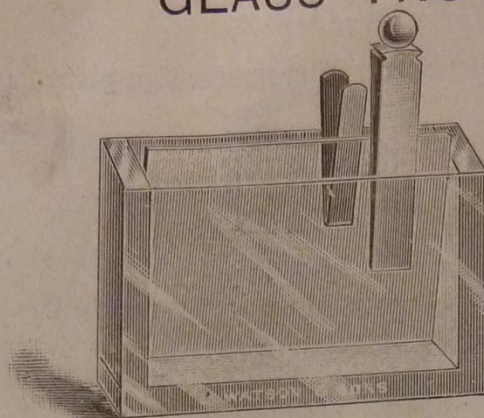
208.	Maltwood's Finder in Morocco Leather Case	0	6	6
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LEVER COVER GLASS GAUGE.

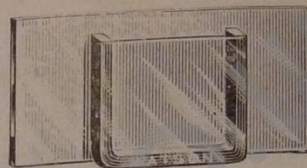
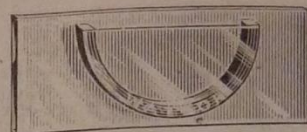
209. This consists of a sheet of brass $6 \times 2\frac{1}{2}$ in., on which is fixed at one end a long pointer, reading on to a graduated arc at the other end. Mounted on this pointer is a projecting tooth which is pressed against a vertical plate of steel by a spring. The disc of glass to be measured is placed between the tooth and the steel plate, and its thickness is indicated in thousandths of an inch by the figure on the arc against which the pointer reads 1 12 6

This is exceedingly accurate and quickly worked.

GLASS TROUGHS, &c.



No. 210.

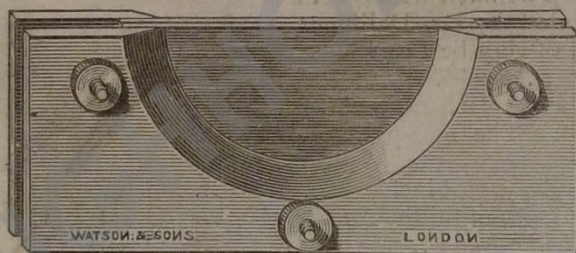


No. 211.

Nos. 210A.

210.	Improved, for animalculæ	... 3 in. × 1 in.	1/0, 3 in. × 1½ in.	£0 1 6
210A.	Ditto ditto	... 3 in. × 1½ in.	1/6, 3 in. × 2 in.	0 2 6
211.	Ditto with plates, wedge and spring, for zoophytes	...	...	0 4 6
212.	Plain Glass Dish, for dissecting	...	...	0 1 0
213.	Large Dissecting Troughs	...	...	0 10 6
214.	Glass Animalculæ Tanks	...	5/0, 7/6 and	0 10 9
215.	Glass Stage Plates, 1/0; large size	...	...	0 1 6
216.	Porcelain Dish, 9 in. × 7 in., extra deep, with cork loaded with lead for dissecting under water	...	...	0 4 6

BOTTERILL'S TROUGH, &c.



217. This is composed of two plates of vulcanite, held together by three screws, between which are placed two slips of glass separated by an ordinary india-rubber ring. The glasses can be readily taken out and cleaned, and in the event of being broken, can at once be replaced.

Price 3/0 each.

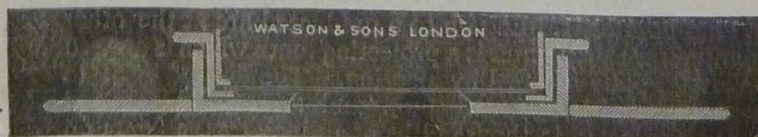
218.	BOTTERILL'S LIFE SLIDE for watching the development of Confervæ, Infusoria, &c.; the best form made	£0 2 0
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LIVE BOXES, &c.



No. 219.

219.	Live Box, large size, best quality	£0 10 6
220.	Ditto medium size	0 5 6
221.	Ditto small size	... ..	0 2 6



No. 222.

222.	Rousselet's Live Box for use with Condenser, Paraboloid, &c.	0 10 6
------	--	--------	--------

The advantages of this are:—it can be used in conjunction with the Sub-stage Condenser, Spot Lens, &c., and that there is sufficient margin between the edge of the glass base disc—on which the object is compressed—and the edge of the cell carrying the cover glass, for the Objective to work at any point where compression can take place. * Extra covers for Live Boxes, 4s. per oz.

COMPRESSORS.



No. 223.

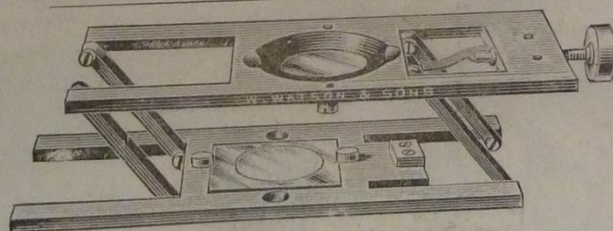
223. **IMPROVED ROUSSELET'S COMPRESSOR.** This acts the double purpose of a Trough and Compressor for high power work. The compression is effected by a screw in the drum at the side, and the glass having a square top, media can be dropped in during the examination of the specimen. The Objective can work at any point where compression can take place, as in the Live Box, No. 222. The arm carrying the cover glass can be turned completely aside for cleaning, &c., and is held in the centre position by means of a spring catch. The special feature of improvement made by us on the original form is that the cover glasses are affixed by means of two simple screw clamps instead of by cement. It is, in addition, made in aluminium.

PRICE, with supply of Cover Glasses £0 15 0



No. 224.

224. As figured, of best quality £1 1 0
This is made with the base and cover glass on the same principle as the Rousselet's Live Cage, No. 222.



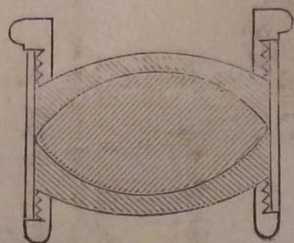
No. 225.

225. Reversible Compressorium, in Aluminium, of best quality, with supply of cover glasses £1 2 6

SUNDRIES.

- | | | | | | | | |
|------|---|-----|-----|-----|---|----|---|
| 226. | Rectangular Prism, with fittings | ... | ... | ... | 1 | 10 | 6 |
| 227. | Ditto Achromatic Prism | ... | ... | ... | 2 | 0 | 0 |
| 228. | Ditto ditto mounted on stand, with universal movements | ... | ... | ... | 2 | 10 | 0 |
| 229. | Erecting Glass to fit in draw-tube to erect the image for dissecting, &c. | ... | ... | ... | 0 | 12 | 6 |
| 230. | Centring Nose-piece to make any Objective true with a Rotating Stage | ... | ... | ... | 0 | 15 | 0 |
- For Mounting Materials and Apparatus, see page 91.

MAGNIFIERS.



No. 232.



No. 235.

W. WATSON & SONS' NEW SERIES of APLANATIC MAGNIFIERS.

These are composed of 3 Lenses cemented together (after Steinheil) as shown figure 232, and give a very flat and large field, exquisite definition, and have good working distance. For dissecting purposes and as Pocket Lenses they are unexcelled. They are mounted in two forms, (1) with nickel-plated tubes of uniform size to fit our Laboratory Dissecting Microscope quoted page 69, each enclosed in a small wooden case, (2) and for the pocket in German silver folding mounts, as illustrated in No. 235. They are made in three powers, as follows:—

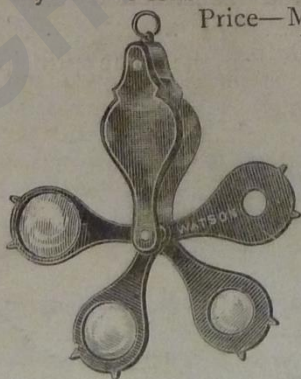
	(No. 232)	(No. 233)	(No. 234)
Magnifying power	6	10	20 diameters.
Diameter of Visual Field	$\frac{7}{8}$ in.	$\frac{5}{8}$ in.	$\frac{1}{4}$ in.
Focal distance from Object to lower surface of the Lens	$\frac{7}{8}$ in.	$\frac{1}{6}$ in.	$\frac{1}{16}$ in.

PRICES—For dissecting purposes, in box, either power, **14s. 6d.** each.

For the pocket, in German silver mount, **15s. 6d.** each, either power.

Mr. E. M. Nelson's Aplanatic Magnifier, as made by W. Watson and Sons to Mr. Nelson's formula and exhibited by him before the Quekett Club, 17th January, 1896. Its special features are—great working distance and large aperture. The magnifying power is 15 diameters, and it is, we believe, unequalled by any similar lens for working qualities.

Price—Mounted for dissecting, similar to No. 232, **14s. 6d.**
Ditto the pocket, ditto No. 235, **15s. 6d.**



No. 236.



No. 247.



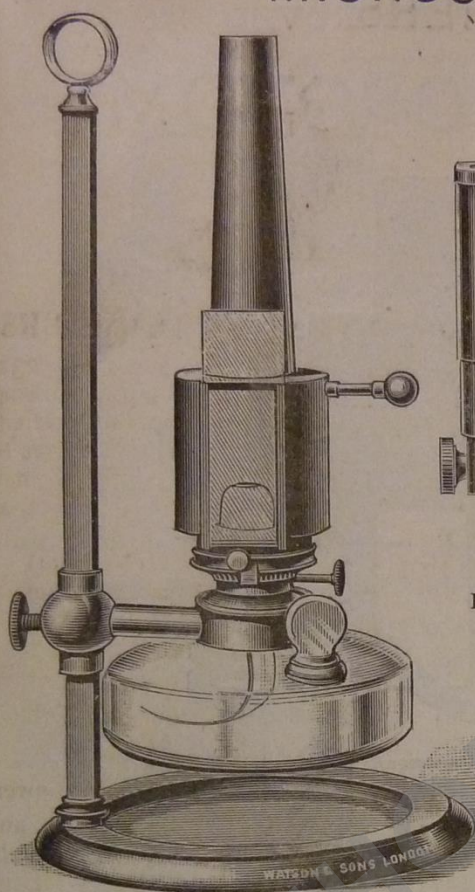
No. 245.



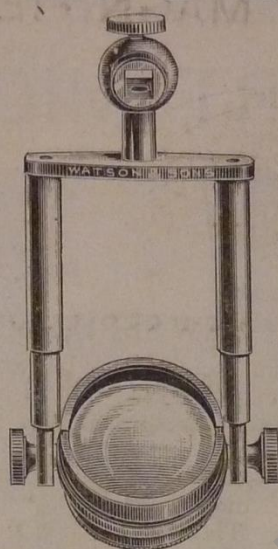
No. 246.

236.	Pocket Magnifier, in folding shell mount, of the very best quality, 3 lenses with diaphragm, as figured	...	...	...	£0	8	6
237.	Ditto ditto, 2 lenses	...	...	...	0	5	6
238.	Ditto ditto, 1 lens	...	...	...	0	3	6
239.	Ditto ditto, second quality, in horn or vulcanite, 1 lens	...	...	...	0	1	6
240.	Ditto ditto	...	...	2 lenses	0	2	6
241.	Ditto ditto	...	...	3 "	0	4	0
242.	Ditto ditto, 2 extra large lenses	...	...	...	0	4	6
243.	Special Magnifier for Botanical work, 2 Plano-Convex lenses	...	...	...	0	2	6
244.	Stand to hold either of the preceding, for dissecting	...	...	...	0	2	6
245.	Coddington Lens, in German silver mount, in 3 sizes, as figured	...	...	...	0	6	6
246.	Single Pocket Magnifiers, in 3 sizes, as figured	4s. 6d.,	5s. 6d.,	and	0	4	6
247.	Watchmakers' Eye Glasses, as figured	1s.,	2s. 6d.,	and	0	1	0

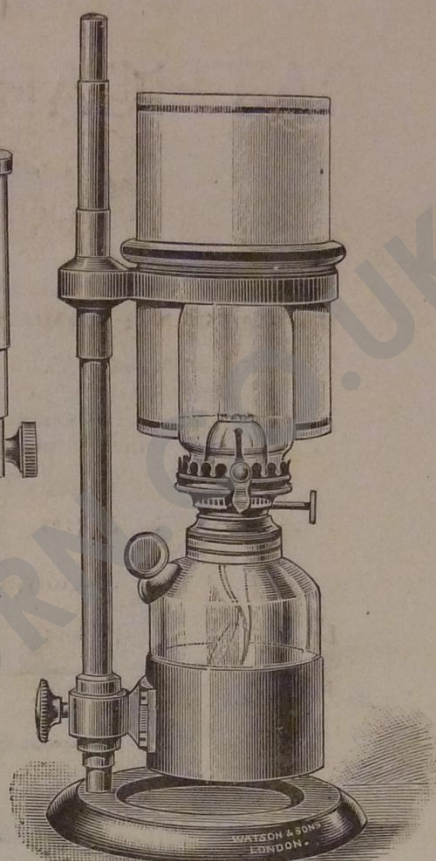
MICROSCOPE LAMPS.



No. 254.



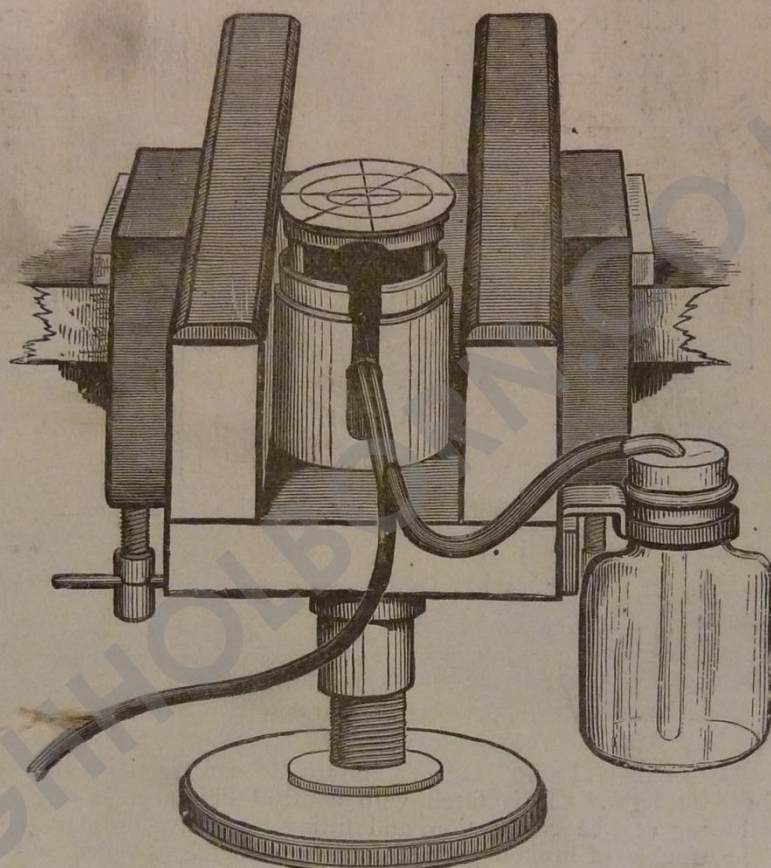
Aplanatic
Bull's Eye, mounted
for Lamp No. 255.



No. 257.

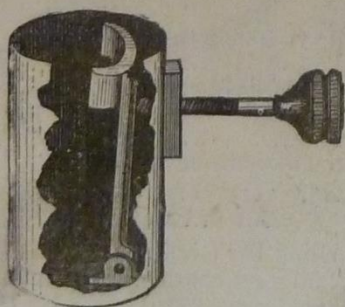
254. This Microscope Lamp is of improved construction and gives a most brilliant light. It is fitted with a metal chimney, having extra large body allowing of free combustion, and fitting to receive ordinary 3in. by 1in. slips. The trouble of broken glass chimneys is thereby avoided and as the inside is blackened, double reflections are prevented. The container being flat, the light can be brought down very near to the table, also it will be noticed that the stopper is built up from the reservoir, thereby obviating the unpleasant leaking usually found in these flat lamps. The supporting bar being square, the lamp is very rigid and has no tendency to swing round as on a circular tube. It burns for ten hours. (Best paraffin oil should be used.) Complete with blue and white slips £1 5 0
255. Ditto, ditto, fitted with Nelson's aplanatic bull's eye condenser, as described page 80 and illustrated above 2 15 0
- This is mounted in the manner illustrated above, and fits on to the bar of the lamp stand : means of focussing are provided. 0 7 6
256. Mahogany Case for above 0 15 0
- This Lamp will be found a most perfect illuminant for Photo-Micrography.
257. Microscope Lamp, for paraffin, as illustrated, very efficient, very convenient, strongly recommended 0 15 0
258. Most complete Microscope Lamp, for paraffin, on a rising bar (similar to No. 257), to fix at any height, silvered reflector, bull's eye condenser, tinted chimney and porcelain shade ; a most convenient pattern ... 1 15 0
259. Mahogany Case for above Lamp 0 6 6
260. Small Glass Microscope Lamp, for mineral oil 0 3 6
261. Extra Chimneys, each 6d. ; 262. Extra Shades each 0 1 6
263. Metal Chimney, as shown on Lamp, No. 254 0 6 0
- NOTE.—It is advisable after use to remove the Metal Chimney, or it is apt to smell when re-lit.

W. WATSON & SONS' IMPROVED CATHCART MICROTOME.



No. 264.

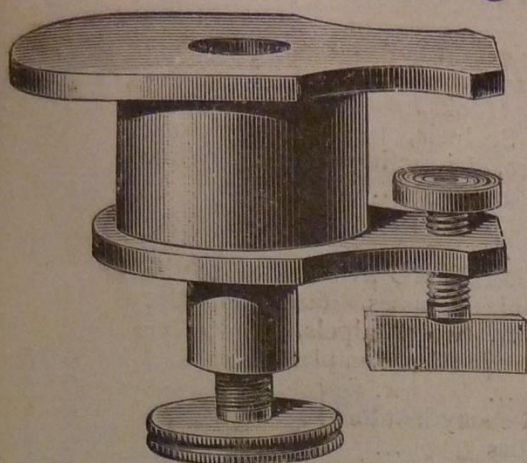
264. We now supply this useful Instrument fitted for either Ether Freezing or Imbedding. For freezing tissues it is arranged as shown above; when it is required to imbed tissues, the tubes and bottle are withdrawn, and the freezing tube drawn out; this latter is replaced by another tube, as shown No. 264a; the substance to be cut, imbedded in paraffin, or other medium, is then inserted, and the clamp screwed. This Instrument is thoroughly well finished, and the adjusting screw milled-head is made specially large to permit of a fine movement being obtained. Improved Microtome as above, with double clamp to fasten it to table, spray bellows, and freezing apparatus tubes for making paraffin blocks, &c.



No. 264a.

265. The above Instrument, arranged for Ether Freezing only	...	£1	1	0
266. Ditto ditto Imbedding only	...	0	17	6
267. Plane Iron Section Knife, in handle...	...	0	15	0
268. Ether Points, extra sets	...	0	2	6
269. Paraffin Wax for imbedding...	...	0	2	0
	per lb.	0	2	0

MICROTOMES.



No. 270.



No. 273.

270. Mr. Cole's Pattern Section Cutter, as figured No. 270. This is a most useful and efficient Pattern Section Cutter, being very solid and rigid when in use. The screw for raising the Sections is very fine, and the milled-head extra large, enabling very thin sections to be cut ... £1 5 0

271. Set of Punches complete, in case, for cutting out imbedding substances. Extra ... 0 5 0

- Mr. Cole's Pattern Section Knife, in case ... 0 4 6

Mr. COLE writes concerning this Microtome :—

“Many thanks for the beautiful Microtome. I have been cutting with it to-day, and find it the best I have ever used.”

272. Smaller size Microtome, best quality, to attach to table ... 0 17 6
 273. Hand Section Cutters, for Botanical work (as figured No. 273) ... 0 5 0
 274. Ditto ditto ditto with glass top ... 0 7 6

FOREIGN MICROTOMES.

These Instruments, by any of the Continental makers, including Schanze, Yung, &c., are imported to order at list prices plus 10 per cent. for carriage to London.

275. Cambridge Rocking Microtome, for paraffin only ... £5 5 0

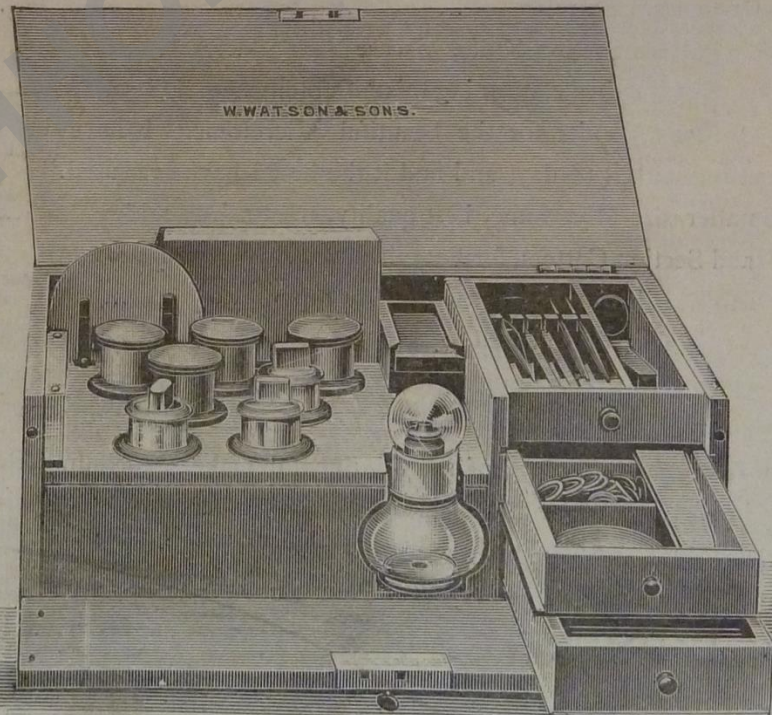
KNIVES FOR SECTION CUTTING.

276. Plano-Concave Section Knife, curved blade ... £0 8 6
 277. Plane Iron Section Knife for Cathcart Microtome ... 0 2 6
 278. Mr. Cole's Pattern Section Knife, in case, a most convenient pattern ... 0 4 6
 279. Razor Blade mounted in fixed handle ... 0 2 6
 280. Razor of good quality and strong make ... 0 1 6

STUDENTS' DISSECTING INSTRUMENTS.

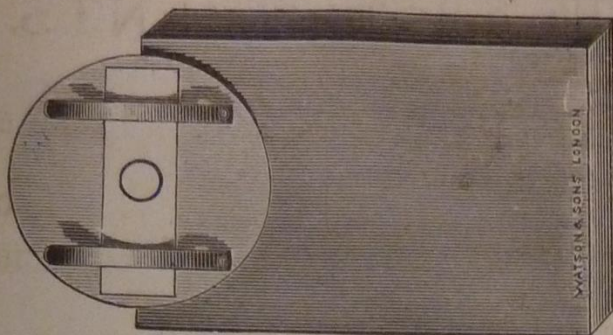
285.	Mahogany Case, containing six Scalpels, two pairs Scissors (plain and curved), two Razors, Seeker, two pairs Forceps (Coarse and Fine), Blow Pipe, Dissecting Hooks, two Needles, &c., &c.	£1 5 0
286.	Mahogany Case, containing six Scalpels, two pairs Scissors, Forceps, Seeker, two Needles, Dissecting Hooks, Blow Pipe, &c.	1 0 0
287.	Mahogany Case, containing three Scalpels, one pair Scissors, two Needles, Forceps, &c.	0 10 6
288.	SPECIAL SET OF INSTRUMENTS as supplied to the County Councils and many Botanical Classes. 6in. and 4½in. Forceps, 6in. and 4½in. Scissors, two Scalpels, Blow Pipe with inside wire, Seeker and two Needles, complete in case ...	0 15 0
289.	Bone Forceps	0 5 6
290.	Dissecting Knives—Scalpels—with ebony handles ... each	0 1 6
291.	Fine Do. with ivory handles	0 1 9
292.	Best Dissecting Scissors, straight, 4½in. and 4¾in. long ...	0 2 6
292a.	Ditto ditto 6in. long	0 3 6
293.	Ditto ditto elbow handles, 4s., curved blades ...	0 4 6
294.	Steel Forceps, 4½in. long, 1/6; 6in. long	0 2 0
295.	Very Fine Steel Forceps, straight or curved points, best make ...	0 2 6
296.	Dissecting Needles, wood handles, 4d.; ivory handles ...	0 1 0
297.	Ditto in best ivory adjustable holders	0 2 6
298.	Set of Hooks for dissecting	0 2 0
299.	Blow Pipe	0 1 0

COMPLETE MOUNTING CABINET.



Containing Turntable, Spirit Lamp, Brass Table, two Dissecting Knives, Forceps and Scissors, Spring Clips, Dissecting Needles, Canada Balsam, Asphalte, Gold Size, Marine Glue, three bottles for Solutions, Glass Slips, Thin Glass Covers, Cells, Labels, &c.

300.	In mahogany case	£2 15 0
301.	In polished pine case	2 5 0



No. 305.

TURNTABLE.

305. The most efficient form, as figured £0 6 6
 306. Patent Self-centring Turntable, new form ... 0 15 0

MATERIALS, &c., FOR MOUNTING OBJECTS.

Slips—

		£	s.	d.
307.	Flatted Crown Glass Slips (3in. by 1in.), rough edges, per dozen 3d., per gross	0	2	9
308.	Ditto ditto ground edges per doz. 5d., 6 doz. 2s. 3d.	0	4	0
309.	Extra Thin (3in. by 1in.) Slips (7 oz.), ground edges ... per dozen 1s.	0	10	6
310.	WATSON & SONS' Special Continental (3 in. by 1 in.) Slips, ground edges per dozen 6d.	0	5	0
These are of white glass, very thin, and of fine quality.				
311.	Flatted Crown Glass Slips (3in. by 1in.), ground edges, per dozen 9d.	0	8	0
312.	Mahogany Slips (3in. by 1in.) with sunk cells or with holes through .. per dozen	0	1	0
313.	Plate Glass Slips (3in. by 1in.) excavated cells ...	0	2	0
314.	Plate Glass ditto, sand blast cells ...	0	3	0

Cover Glasses—

These are made in three thicknesses—No. 1, thinnest; No. 2, extra thin; and No. 3, ordinary thickness used.

315.	Circles—No. 1, 6s. per oz.	316.	No. 2, 4s. 6d. per oz.	317.	No. 3, 3s. 6d. per oz.
318.	Squares—No. 1, 5s. per oz.	319.	No. 2, 4s. per oz.	320.	No. 3, 2s. 9d. per oz.

The above prices are for any size from 1in. upwards. Smaller sizes than 1in. are charged at 1s. per oz. extra.

321.	Buff Block for cleaning thin glass covers ...	each	0	1	0
322.	Hot Plate and Spirit Lamp for mounting ...	...	0	5	6
323.	Wire Spring Clips ...	per dozen	0	1	6
324.	Diamonds for writing on glass ...	each	0	5	0
325.	Ditto for cutting slips and thin glass... ..	15s. to	1	1	0
326.	Ebonite Ring Cells, assorted sizes ...	per box 100	0	2	0
327.	Pure Tin ditto ditto ...	...	0	2	6
328.	Round Punches for cutting holes in labels, 1s. 6d.; large sizes ...	each	0	2	0
329.	Watch Glasses, with flat bottoms ...	per dozen	0	1	6
330.	Best Injecting Syringe, stop cock, three pipes, in case complete ...	...	0	12	6
331.	Air Pump for mounting, with bell glass receiver ...	...	1	1	0



No. 334.

Bottle, with Glass Cap outside, for Balsam and Varnishes (box and postage 4d. extra)—

332. 1 oz. size, 1s. 333. 2 oz. size, 2s.

Glass Boxes with Covers—

334. 1½in. diam. 6d. 335. 2in. 8d. 336. 2½in. 9d.



No. 332.

Mounting Media and Varnishes—

Canada Balsam (finest)
 " " and Benzole
 " " " Chloroform
 " " " Xylol
 Farrant's Medium
 Glycerine Jelly
 Gelatine Compound (Deane's)

Gum Damar Medium
 Oil of Cloves
 Xylol
 Caoutchouc and Shellac Cement
 for Cells
 Black Asphalt Varnish
 Gold Size (best)

Marine Glue (best)
 White Zinc Varnish
 Coloured Varnishes for
 finishing Slides
 Red, Green, Blue.

All the above 1s. per bottle.

	£	s.	d.
... per tube	0	1	0
... per bottle	0	1	6
... per bottle	0	1	6
... per oz. packet	0	3	6

Box and Postage, for bottles, 4d. extra.
 For Staining Solutions, see page 92.

STAINING SOLUTIONS.

Aniline Blue	Borax Carmine	Magenta
Do. Blue Black (Sloe- line or Nigrosine)	Eosin	Schultz's Solution
Do. Green	Fuchsine, Alcoholic	Spiller's Purple
Methyl Blue	Gentian Violet	Vesuvine
Do. Violet	Hæmatoxylin, Ehrlich's	Saffronine
Do. Green	Iodine Green	Picro Carmine
Atlas Scarlet	Do. Solution	Aniline Oil
Ziehl Neelsen's Stain	Nitrate of Silver 5%	
	Logwood (Mitchell's)	

All the above, per bottle 1/-

Eau de Javelle	...	2 oz. bottle	£0 0 9
Dr. Gibbe's Double Stain for Tubercle Bacillus	...	"	0 1 6

Box and Postage, per Bottle 4d. extra.

Osmic Acid	...	$\frac{1}{10}$ gramme in glass tube	0 1 0
Chloride of Gold	...	15 grain tubes	0 1 9

Stains can also be supplied dry in powder to order.

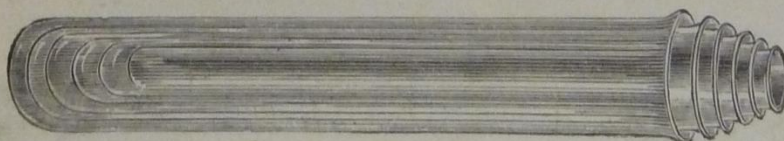
COLLECTING MATERIALS.

337.	Corked Bottles for collecting insects, diatoms, &c.	small, 1/6 per dozen, large	0 2 0
338.	Metal Pocket Cases, velvet lined, size 4 1-16 by 2 7-8 by 15-16 in., containing 5 collecting bottles, corked		0 3 0



No. 338.

339.	Ditto	ditto	ditto	6	ditto	stoppered	0 5 6
340.	Ditto	ditto	ditto	10	ditto	(short) corked	0 3 6
341.	Best Jointed Collecting Rod, two Bottles, Drag Hooks, Line and Reel, Net Ring, Spoon, and Cutting Hook	...	...	...	...	...	0 17 6
342.	Glass Dipping Tubes	...	...	...	...	...	0 0 3
343.	Ditto, three in leather case	0 1 6

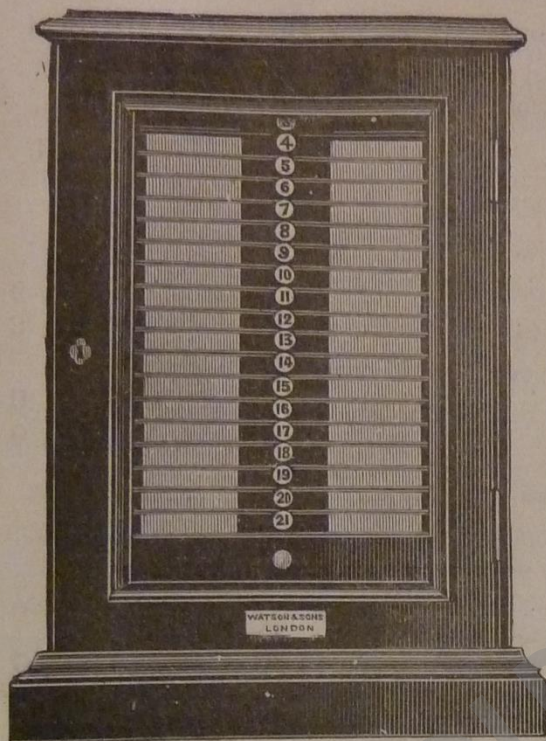


344.	Set of six Test Tubes, various sizes, in cardboard case	0 0 9
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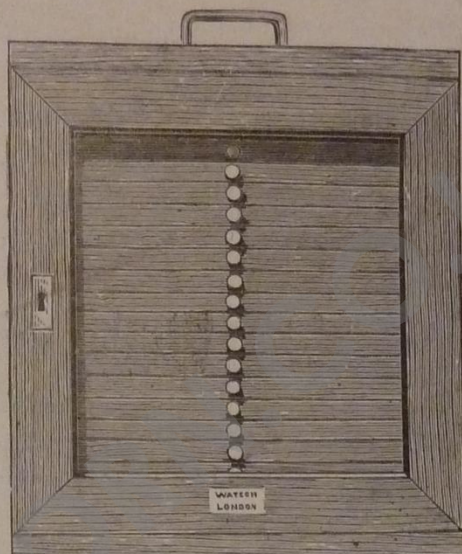
REVOLVING MICROSCOPE TABLE.

345.	Height, 26 inches. Revolving top, leather covered, 26 inches diameter. Screw to fix top when rotation is not required. With handsome carved legs of best workmanship throughout. In Oak, Walnut, or Mahogany	6 15 0
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CABINETS FOR MICROSCOPIC OBJECTS.



No. 349.



No. 345.

345.	Very neatly made Cabinet of polished pine, with glass door, lock and key, to hold 200 objects, as figured No. 345	£1	1	0
346.	Ditto ditto, to hold 500 objects	...	...	2	0	0
347.	Ditto ditto, to hold 1,000 objects	...	...	3	0	0
348.	Mahogany Cabinet of superior workmanship with mouldings top and bottom, to hold 280 objects, each drawer numbered, with an extra drawer deep enough to hold materials, &c.	...	...	3	5	0
349.	Large handsome mahogany Cabinet to hold 500 objects, each drawer numbered and furnished with porcelain plates on the front, as figured No. 349	...	...	5	10	0
350.	Ditto ditto, to hold 1,000	...	...	9	10	0
351.	Very neat polished pine Case, to hold 2 dozen objects in six trays	...	...	0	2	6
352.	Ditto ditto 3 " " " " " "	...	...	0	3	0
353.	Ditto ditto 4 " " " eight " "	...	...	0	3	6
354.	Ditto ditto 6 " " " twelve " "	...	...	0	4	6
355.	Ditto ditto 12 " " " " " "	...	...	0	10	6
356.	Cloth covered Cases with velvet lining, to hold 6, 6d.; to hold 1 doz.	...	...	0	0	9
357.	Ditto ditto " " " 2 " "	...	...	0	1	0
358.	Ditto ditto " " " 3 " "	...	...	0	1	6

BOXES, CASES, & CABINETS FOR OBJECTS, &c.

Pine Boxes with Mahogany Racks—

359.	To hold	6	12	24	36	72	Objects.
		3d.	4d.	6d.	8d.	1s.	each.

360. Pine Boxes for Postal Transit, to hold 1, 2, or 4 Slides, 1s. 6d. per dozen.

POCKET FOLDING CASES, with outer sheath, very compact—

361.	For 6 objects	...	...	...	...	£0	0	6
362.	For 12 objects, of new form, to prevent movement of the specimens	...	...	...	...	0	1	6

MICROSCOPIC OBJECTS.

A CLASSIFIED list, representing a stock of 50,000 Microscopic Objects, illustrative of every branch of study, will be forwarded, post free, on application.

We have undoubtedly the finest stock in the world of Microscopic Objects of the very highest class, each specimen being exactly typical of the structure represented, rendering them of the greatest value to Students.

Rare and interesting specimens affording illustrations in Anatomy, Physiology, Botany, Entomology, Geology, Mineralogy, Diatomaceæ, &c.

We were awarded a DIPLOMA OF HONOUR at the International Exhibition of Microscopes, Antwerp, 1891, for the excellence of our Microscopic Objects.

The following Sets are quoted from our Micro-Object Catalogue, and are always kept in stock :—

Series 1.—24 Educational Physiological Preparations	...	...	£1 18 6
„ 5.—24 (Surgical) Pathological ditto	...	...	1 18 6
„ 6.—24 Pathological ditto	...	...	1 18 6
„ 7.—12 Typical Urinary Deposits	...	...	0 18 6
„ 9.—36 Slides, specially arranged for Students for the Diploma of Public Health (as approved by Dr. F. J. Allan, and referred to in his "Aids to Sanitary Science")	...	...	2 10 0
„ 11.—12 Test Objects for various powers	...	...	1 1 0
„ 12.—24 Choice selected Diatomaceæ	...	...	1 15 0
„ 13.—24 Specially selected specimens for Micro-Polariscope	...	...	1 7 6
„ 14.—24 Botanical Slides (Elementary Tissues) specially arranged for use of Students	...	...	1 4 0
„ 15.—24 ditto (Comparative Anatomy) ditto	...	...	1 12 6
„ 16.—24 Specially selected interesting Opaque Objects for Binocular Microscope	...	...	1 12 6
„ 17.—24 ditto specimens suitable for dark ground illumination	...	...	1 12 6

COMPLETE CABINETS OF MICROSCOPIC OBJECTS.

- No. 1.—Very handsome Mahogany Cabinet of the highest quality, containing 1,000 Objects of general interest to a Microscopist; each specially selected to typify in the best manner the subject of which it is illustrative—including rare specimens in Diatomaceæ, Foraminifera, Marine Soundings, Fossil Woods, &c.; and comprising a general assortment of Anatomical, Botanical, Geological, and Entomological specimens, forming a collection of the very first order and well suitable for presentation. Each drawer has a descriptive Tablet affixed notifying its contents ... £75 0 0
- No. 2.—Very handsome Mahogany Cabinet as above in every respect, but containing 500 Objects, all of the highest quality and including many extremely rare specimens ... 40 0 0
- No. 3.—Very handsome Mahogany Cabinet of the highest quality as above in every respect, but containing 280 Objects, all of the very finest quality, and including many extremely rare specimens ... 24 0 0
- No. 4.—Very neatly made Pine Cabinet with glass door, lock and key; containing 200 preparations of the finest quality, illustrations of Anatomy, Physiology, Pathology, Urinary Deposits, &c. ... 17 10 0
- No. 5.—Pine Cabinet as above, containing 200 Objects of general interest; Diatomaceæ, Foraminifera, Marine Soundings; Crystals for Polariscope, Botanical Specimens, Entomological, &c., all of the very highest quality ... 14 14 0

Microscopic Object Cabinets made to any size or pattern, and fitted with Typic^l Slides to illustrate any required branch of Study.

WORKS ON THE MICROSCOPE.

VAN HEURCK. "The Microscope; its Construction, Manipulation, Technique." "Photo-Micrography," &c. Translated from the French by Wynne E. Baxter, Esq., F.R.M.S.	£0	18	0
COOKE. "One Thousand Objects for the Microscope" ...	0	1	0
CARPENTER. "The Microscope and its Revelations" ...	1	6	0
HOGG. "The Microscope" ...	0	7	6
WOOD. "Common Objects of the Microscope" ...	0	1	0
GRIFFITH & HENFREY. "Micrographic Dictionary" ...	2	12	6
DAVIS. "Practical Microscopy" ...	0	7	6
BOUSFIELD. "Photo-Micrography" ...	0	6	0
SQUIRE. Methods and Formulæ for the preparation of Tissues for Microscopical Examination ...	0	3	6
MILLS. An introduction to the study of the Diatomaceæ, with a Bibliography by Julien Deby, Esq. ...	0	12	0
MILLS. "Photography applied to the Microscope." Cloth ...	0	2	0
CROSS & MARTIN J. COLE. Second Edition. Just issued. Revised and Enlarged. "Modern Microscopy," a handbook for beginners. Two Parts in One Volume.			

PART I. The Microscope and Instructions for its use, by M. I. Cross.

2. Microscopic Objects, how prepared and mounted, by Martin J. Cole ... 0 3 6

WRIGHT. "A Popular Handbook to the Microscope" ...	0	2	6
KERR. "The Hidden Beauties of Nature" ...	0	3	6
PRINGLE. "Practical Photo Micrography." New Edition ...	0	5	0
SCHERREN. "Ponds and Rock Pools" ...	0	2	6

HAND MAGNIFYING GLASSES.

For Reading, Examining Photographs, Maps, &c.

Of the highest class, in Richly Gilt Mounts, with shaped pear handles, very handsome in appearance, as figured.

Extra for velvet-lined morocco case.

	Price.	
833. $2\frac{1}{8}$ in. diameter..	7s. 6d.	3s.
834. $3\frac{1}{4}$ in. ,,	10s. 6d.	4s. 6d.
835. 4 in. ,,	15s.	6s.

In Ornamental Silver Mounts, and handles, Hall marked.

836. $2\frac{1}{2}$ in. diameter ...	12s. 6d.	838. 2 in. diameter ...	10s. 6d.
837. $3\frac{1}{2}$ in. ,, ...	£1 5s.	839. 3 in. ,, ...	18s. 6d.

Mounted in Tortoiseshell, with Silver Mounts, Hall marked.

In German Silver Mounts, and Black Handles as figured.

840. $1\frac{1}{2}$ in. diameter ...	2s.	844. $3\frac{1}{2}$ in. diameter ...	6s. 6d.
841. 2 in. ,, ...	2s. 6d.	845. 4 in. ,, ...	8s. 6d.
842. $2\frac{1}{2}$ in. ,, ...	3s. 6d.	846. $4\frac{1}{2}$ in. ,, ...	11s. 6d.
843. 3 in. ,, ...	5s.	847. $4\frac{3}{4}$ in. ,, ...	14s. 6d.

The THOMA-ZEISS HÆMACYTOMETER,

By C. ZEISS JENA.

This apparatus consists of a counting chamber in combination with an accurately calibrated mixing pipette for diluting the blood in a certain ration (1:100 for red, 1:10 for white corpuscles), with directions, in case.

(a). With mixing pipette for red corpuscles ...	£1	10	0
(b). " " " white " ...	1	12	0
(c). The same apparatus with both pipettes ...	2	4	0

PIPETTE SEPARATELY—

For red corpuscles (diluting 1:100) ...	0	12	0
For white " (" 1:10) ...	0	14	0

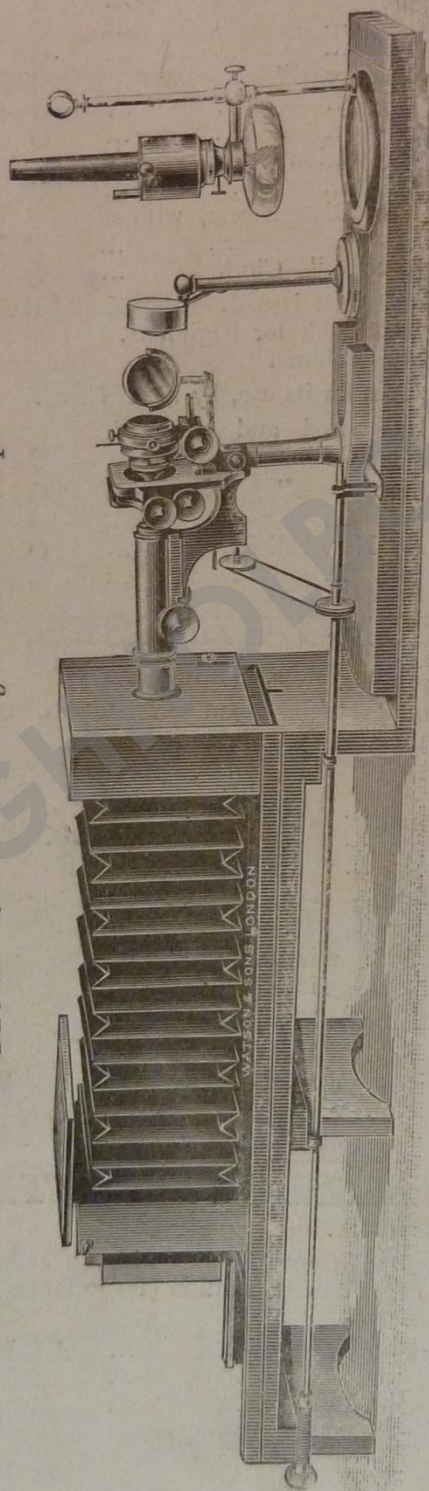
The above is probably the best form of Hæmacytometer that is made.

CAMERAS, &c., FOR PHOTO-MICROGRAPHY.

Returnable Packing Cases for these are charged at cost price.

THE STUDENT'S PHOTO-MICROGRAPHIC CAMERA.

Made to suit any Microscope.



MAHOGANY CAMERA, 6½ by 4¾ in.

With bellows body, extending to 30 in., the base of the Camera having a divided scale let into it so that the distance between lens and plate may be accurately known to obtain any desired amount of amplification; has a rod running from the back of the Camera to the front, to attach to the Fine Adjustment, for focussing from back of Camera; fitted with our new pattern projecting detachable front for holding Microscope and Lamp; this consists of two boards, one rotating on top of the other, on metal centres. The Microscope being fitted on the projecting front, the board carrying the Instrument, &c., can be turned half-way round for adjustment visually, and the object fixed in position ready for Photography; the board is then turned back, and locks central with the front of the Camera. In this way the object can be perfectly adjusted without inconvenience. With one double dark slide ... £4 15 0

Inner Frames, for 3½ by 3½, 4½ by 3½, or 5 by 4 plates 1/9 each. Extra focussing screen, plate glass, 5/6.

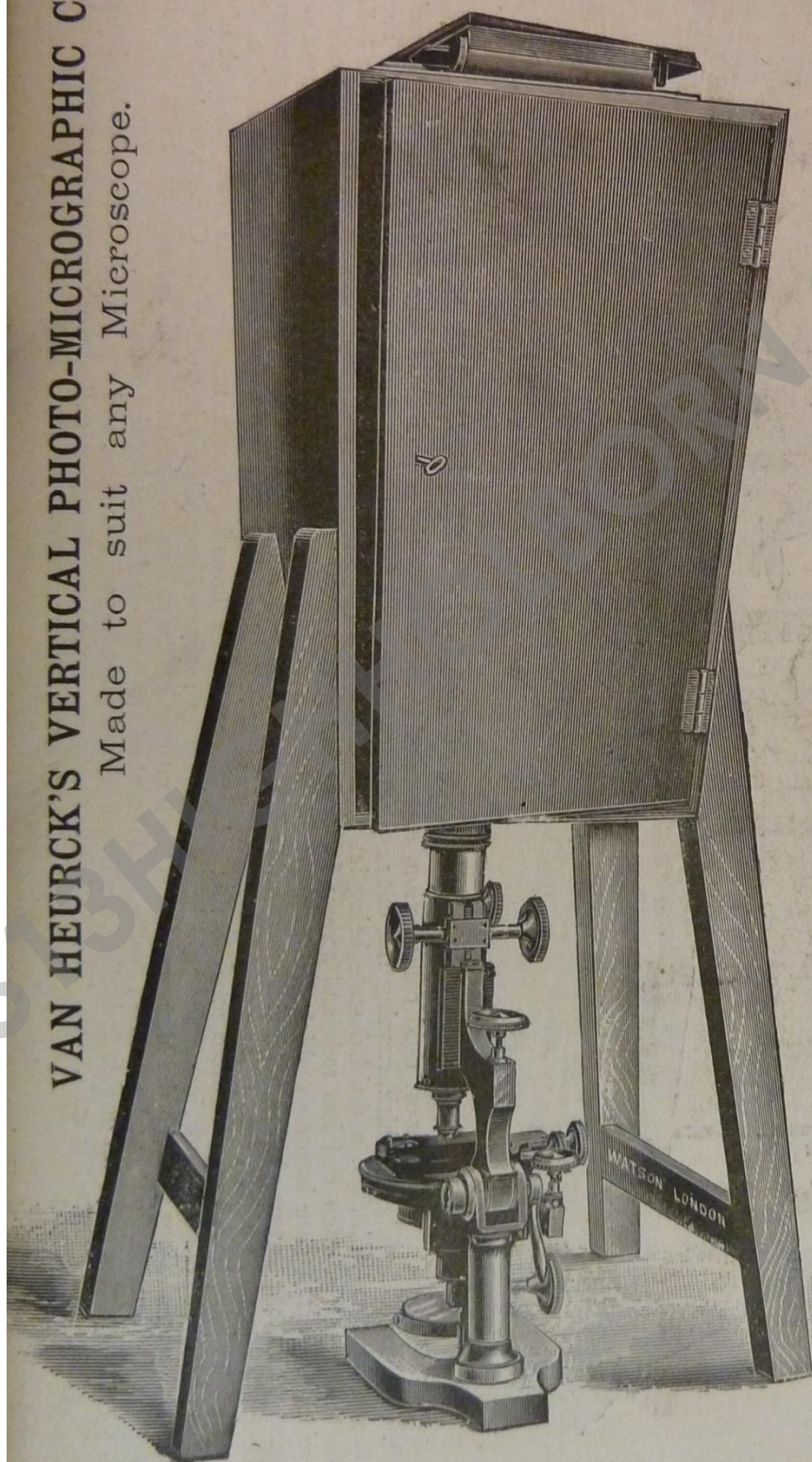
For extra Fittings, see page 100.

Brass Connecting Flanges for Microscope and Camera to exclude light ... 8/6

Making Fittings to hold Microscope, Lamp, &c., on baseboard, from 5/0 to 10/0 according to requirements

VAN HEURCK'S VERTICAL PHOTO-MICROGRAPHIC CAMERA.

Made to suit any Microscope.

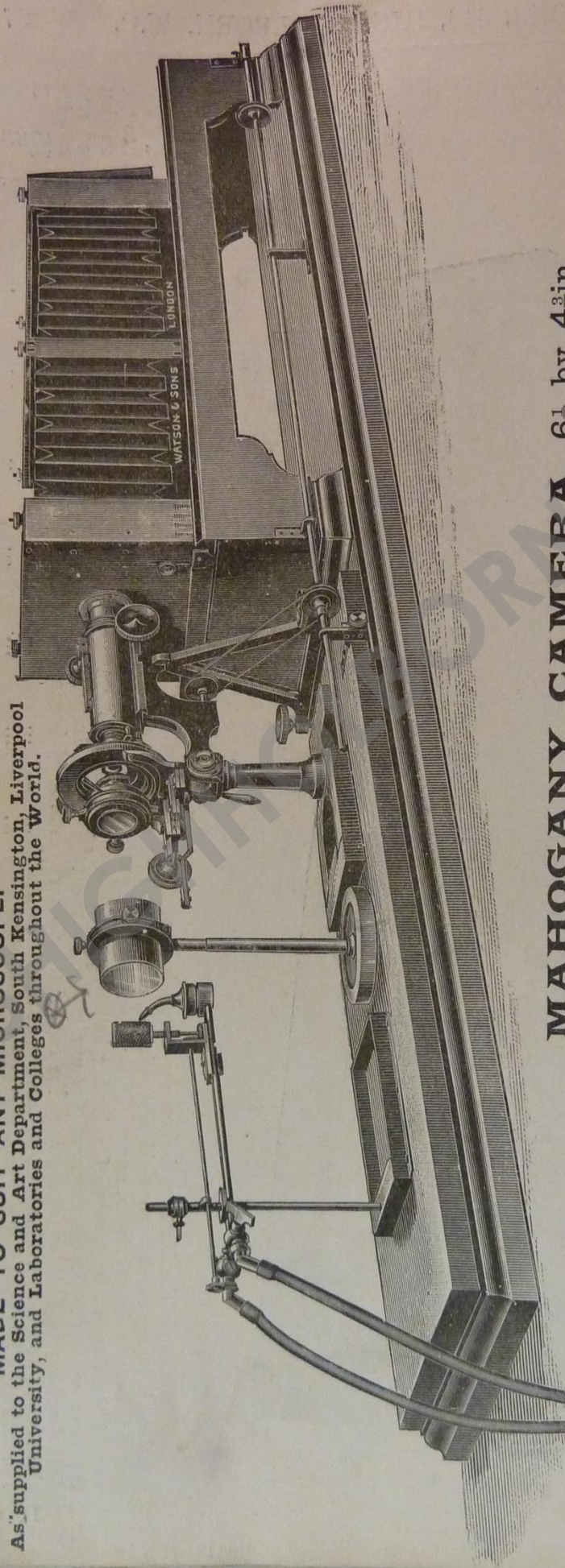


Although the Horizontal form of Camera is generally used, a Vertical Camera is frequently enquired for, and is becoming increasingly popular, it being exceedingly rigid and efficient, and can be immediately put over the Microscope without necessitating re-adjustment. We now make one as figured above, as used by Dr. Van Heurck for all his delicate high power work. The tube of the Microscope is attached to the base of the Camera by means of a leather bellows. On one side of the Camera body, a door having rabbetted fittings is placed so that the head can enter the Camera, and the eye placed to the tube of the Instrument to make the adjustments; the door is then closed and final focussing is done on a screen at the top of the Camera. Price, Mahogany Camera, suitable for any Instrument, with mask to give clean edge to picture, diaphragm, and one $\frac{1}{2}$ plate double dark slide... £4 15 0
 Inner Frames 1/9 each : extra Focussing Screen, plate glass ... 0 5 6
 Mahogany Base Board with levelling screws and fittings for the Camera feet and Instrument ... 1 5 0
 Brass Connecting Flanges for Microscope and Camera to exclude light ... 0 8 6

THE LABORATORY PHOTO-MICROGRAPHIC APPARATUS.

MADE TO SUIT ANY MICROSCOPE.

As supplied to the Science and Art Department, South Kensington, Liverpool University, and Laboratories and Colleges throughout the World.



MAHOGANY CAMERA, 6½ by 4¾in.

This Camera is of the most rigid construction, and suitable for work of the most delicate nature. It has a solid mahogany base board 5ft. 6in. long and 1¼ inches thick, running the entire length, carrying both the Camera and Microscope with apparatus. The Camera itself has an extension to 36 inches, a divided scale being let in so that any required amplification can be at once obtained; the bellows is supported in the centre and at each end has rods and screws for clamping during exposure, giving a perfect rigidity and freedom from vibration. The projecting part of base board on which the instrument is placed is 24 inches long. On this, rotating on a metal turntable, is fitted another board which can be turned at right angles so that all adjustments may be made visually, then turned back to the photographic position and clamped, when the object, &c., will be readily adjusted. A rod runs along the side of the Camera by which connection is made with the fine adjustment milled-head of the Microscope, so that adjustments on the focusing screen may be made from the back of the Camera. This rod is in two pieces, which are instantaneously keyed together or separated immediately in front of the Camera, so that when the rotating front flap shutter worked from outside is fitted on the inside front of the Camera the rod remain intact. This is a new and most advantageous device. A Price, ½ plate size, with 1 double dark slide, plain and ground glass focussing screens, and mask to give clean edge to photograph £10 10 0 Inner frames 1/9 each.

The highest powers may be used and the most critical work may be done with this Camera.

For extra fittings, see page 100.

Brass Connecting Flanges for Microscope and Camera to exclude light, 8/6.

Making Fittings to hold Microscope, Lamp, &c., on baseboard, from 5/0 to 10/0 according to requirements.

Vertical Camera for Instantaneous Photo-Micrography

As manufactured by us to the design and for the use of Mr. ANDREW PRINGLE.

It consists of a solid Mahogany Camera supported on four legs, which are attached to a massive baseboard. The body is similar to that of the Van Heurck Camera, figured page 97, but is of larger size. At the lower end of the body five runners are fitted, in either of which a tray can be placed carrying an Instantaneous Shutter, which is provided with an arrangement for time exposures and for varying the speed; it has a pneumatic discharger, and is set and worked from the outside of the Camera. The metal work of this Shutter is of aluminium, the light weight obviating vibration when exposing. When the Shutter is set, a first surface mirror placed at an angle of 45 degrees is exactly over the optical axis of the Microscope, and reflects the image of the specimen that is to be photographed through a brass tube fitted to, and extending from, the exterior left-hand side of the Camera. The tube is provided with a means of raising and lowering to the plane of the Shutter, and has an adjustment horizontally. The ground-glass for focussing is mounted at the end of the tube, and a sliding adjustment is afforded so that the distance from this to the Microscope may be identically the same as from the top of the Microscope to the double dark Slide in which the sensitive plate is contained. This latter fits on the top of the Camera, and the usual focussing glass is there provided.

To take plates $6\frac{1}{2}$ by $4\frac{3}{4}$ in., with two Inner Frames, plate glass focussing screen, Mask to give clean edge to picture, of polished Mahogany throughout, and of the very finest workmanship and quality ... £25 0 0
Quarter-plate Repeating Back for same 3 10 0

HELIOSTATS.

For Sunlight Illumination for Photo-Micrography.

Dr. G. J. Stoney's Local Heliostat is provided with clock-work, and can be made for any desired latitude. It is exceedingly simple in operation, and answers in every way for Photo-Micrography. In case ... £5 5 0

SETS OF CHEMICALS FOR DEVELOPMENT, &c.

No. 5.—Well made, partitioned pine chest, containing 3 dozen ($\frac{1}{2}$ plate) isochromatic dry plates, 3 celluloid and 1 porcelain dishes, folding lamp, 2 measures, 2 printing frames, draining rack, 2 bottles special developing solution and restrainer, fixing cartridges, toning solution, 3 packets sensitive paper (P.O.P.), complete ... £2 10 0

No. 6.—Partitioned box, containing 12 dozen isochromatic dry plates ($\frac{1}{2}$ plate), 2 developing dishes, 1 bottle developing solution, dark room lantern, 1 measure, 1 printing frame, 1 deep porcelain dish, 3 sheets sensitive paper (cut to size), supply of hypo. soda, and bottle toning solution ... £1 12 6

FOR PRODUCING LANTERN SLIDES FROM NEGATIVES.

No. 7.—Partitioned box, containing 3 dozen lantern plates ($3\frac{1}{4}$ by $3\frac{1}{4}$), 3 dozen cover glasses, binding strips and masks and discs, special printing frame, hydro-kinone developer, draining rack, &c., complete ... £1 7 6

For particulars of Photographic Apparatus and Chemicals,
see Photo. Catalogue, sent post free on application.

COMPLETE SETS of PHOTO-MICROGRAPHIC APPARATUS.

Add to the following, the Camera and fittings desired.

ILLUMINANT, LIMELIGHT.

No. 1. OXY-HYDROGEN LIGHT.

Best quality jet, with rack-work adjustments in vertical and horizontal directions for focussing and centreing, with Pringle's "cut off," enabling light to be turned down very low when not in actual use	£4	10	0
2 Brin's Gas Bottles, each containing 12ft. gas, at £2/3/9	4	7	6
2 Regulators for ditto	3	0	0
20ft. India rubber tubing	0	10	0
2 doz. best hard limes	0	5	0
Brass mounted trough on stand, to contain light or heat absorbing media	1	0	0
Aplanatic bull's eye condenser, as described page 80, on stand, with centreing screws, and Iris diaphragm	4	5	0
Focussing glass	0	10	6
Projection eye-pieces, 2 and 4, at £2/0/0	4	0	0
	£22	8	0

No. 2. OXY-CALCIUM LIGHT.

For Oxygen under pressure, and house gas.

Best quality blow-through jet	£1	0	0
1 Brin's Gas Bottle, containing 12ft. Oxygen	2	3	9
Regulator for ditto	1	10	0
20ft. India rubber tubing	0	10	0
1 doz. best hard limes	0	2	6
Brass-mounted trough on stand, to contain light or heat, absorbing media	1	0	0
Aplanatic bull's eye condenser, as described page 80, with centreing screws on stand	3	0	0
Focussing glass	0	10	6
Projection eye-piece	2	0	0
	£11	16	9

No. 2 Set can only be used if house gas is available, otherwise No. 1 Set will be necessary.

No. 3.

ILLUMINANT, OIL.

Microscopelamp (No. 254, page 87) with metal chimney	£1	5	0
Nelson's aplanatic bull's eye condenser	1	10	0
Projection eye-piece	2	0	0
Focussing glass	0	10	6
	£5	5	6

No. 4.

Microscope lamp (No. 257, page 87)	£0	15	0
Stand condenser, No. 178	0	10	6
Focussing glass	0	5	0
	£1	10	6

ILLUMINANT DAYLIGHT.

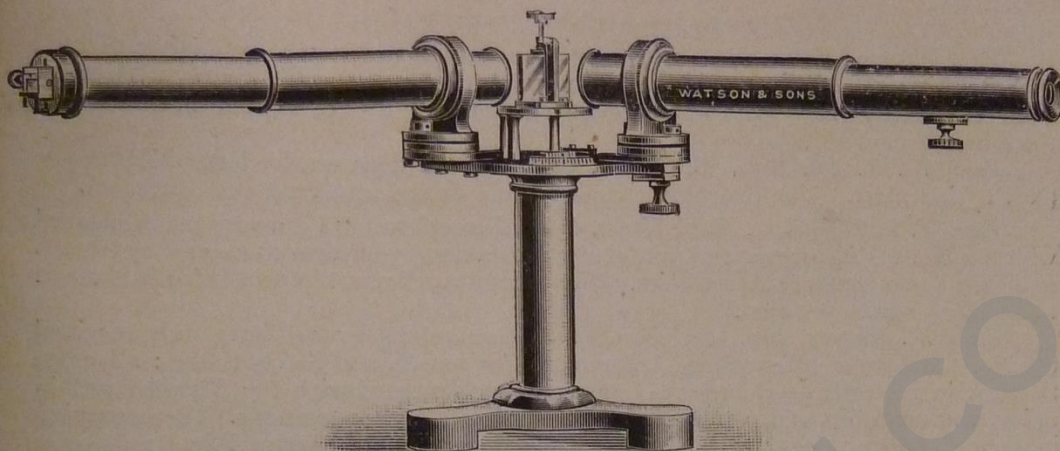
Heliosat (as per page 99) £5 5s. od. and accessories quoted in Sets Nos. 1 and 2 above omitting the first five items in either.

For Daylight Illumination, without Heliosat, the last four items only of either the No. 1 or No. 2 Set would be necessary.

SPECIAL NOTE.—The above Sets can be varied in any way that may be desired, but we have endeavoured to quote in them the apparatus that is most essential. For instance, the mechanical movements mentioned, as attached to the Jet in Estimate No. 1, could be supplied to the Jet in Estimate No. 2, the cost of the latter then being £4 os. od.

Full particulars of and estimates for Sets of Apparatus will be supplied on receipt of particulars of work to be done.

SPECTROSCOPES.



Student's Chemical Spectroscope.

WITH TELESCOPE AND COLLIMATOR.

1025. This Instrument is of thoroughly first-class workmanship and quality throughout, and is provided with a single dense $1\frac{1}{4}$ in. prism. It has achromatic object glasses $1\frac{1}{4}$ in. diameter, adjustable slit fitted with a reflecting prism, by means of which two spectra can be shown in the field of view at the same time, rackwork adjustment to eye end of telescope, and Huyghenian eyepiece. The circle is divided to $\frac{1}{2}$ degrees, and reads by a vernier to one minute, enabling angular measurements to be taken. Price in Polished Pine Case £6 15 0
1026. Instrument similar to above, but with two prisms of dense glass, rackwork adjustment to eyepiece tube, and tangent screw motion to vernier. Of very finest quality, in Mahogany Case £16 10 0

DIRECT VISION SPECTROSCOPES.

1023. Pocket Spectroscope, with adjustable slit, will show many of Fraunhofer's lines, absorption bands in liquids, crystals, &c. In Morocco Case £1 12 6
1024. Ditto, ditto, with achromatic lenses, and rackwork to focus £2 15 0

Estimates for Spectroscopes of larger size than the above. and for Special Work, on Application.

The following Extracts from Letters, received from Customers that we have supplied with Instruments, are examples of many that reach us:—

(See also pages 18-20, 47-49, and 53.)

From Edmund Welch, Esq., 115, Hyde Park Road, Leeds: "I am highly pleased with the Instrument (No. 1 Binocular), and think the workmanship simply perfection. I am particularly glad I got the best stage; its capabilities are wonderful, and excite the admiration of all who see it."

From W. A. Lee, Esq., 38, Strand, Calcutta: "I duly received the Microscope (No. 1 Binocular). The Instrument is all I could desire, and I am quite satisfied."

From T. Ratcliffe, Esq., Park House, Colne, Lancashire: "I am very much pleased with the No. 1 Microscope, and will gladly recommend your firm to any of my friends requiring Instruments or Accessories. For careful workmanship and finish it is equal to anything I have yet seen."

From W. Harvey, Esq., Sari Feri Mines, Constantinople: "I have duly received the No. 1 Binocular Microscope, Achromatic Condenser, and Safety Stage; all came to hand in perfectly good order. I am very much pleased with the Microscope; in finish, workmanship, and performance it far surpasses my expectations. The engraving in your Catalogue does not do it justice. I thought it dear when I had only seen the Catalogue, but my opinion on that point is just reversed now I have the Instrument itself before me. You may depend on my coming to you for any apparatus I require in the future."

From the Rev. George Davidson, The Manse, Logie-Coldstone, Dinnet, Aberdeen: "As far as I have yet seen, your No. 1 Microscope seems a most beautiful and carefully finished Instrument. The Stage is a marvel of ingenuity, and reflects great credit on the designer. It is certainly out-of-sight superior to any other yet designed."

This same gentleman writes further: "Having now got quite familiar with the working of the Instrument, I am glad to be able to say that it surpasses the high anticipations I had formed regarding it. In all its details it seems perfect, and reflects the highest credit on your workmanship."

From Dr. T. Coke Squance, M.D., M.S., F.R.M.S., F.R. Met. Soc., L.S.Sc., &c., Physician and Pathologist to the Sunderland Infirmary: "Messrs. W. WATSON & SONS have lately supplied me with four of their Microscopes, viz., two of their No. 1 Swinging Sub-stage Binocular Instruments, fitted with their patent concentric rotating stages—stages which more than fulfil what they claim for them—one Edinburgh Student's Microscope, Stand 'D,' and one of their No. 6 Microscopes with Swinging Mirror and Sub-stage, into which they have introduced certain modifications. All the instruments are beautifully finished, and adapted for any branch of microscopical research. I have compared their Objectives with those of other makers, and find they give quite as good, if not better, results, and are much less expensive. The fine adjustment is specially good, being exceedingly delicate and without the slightest lateral movement. For Pathological and Bacteriological work, a better instrument than the Edinburgh Microscope, Stand 'D,' could not be desired, and it is also specially adapted for Photo-Micrography."

From Professor W. Lighton, Leavenworth Microscopical Society, Leavenworth, Kan., U.S.A.: "I received the Microscope (No. 3) a short time ago, and am very much pleased with it. The fine adjustment is by far the best I have ever seen, and the workmanship throughout is first-class."

From W. Berkshire, Esq., near Lydenberg, Transvaal, South Africa: "I am more pleased than ever with the Microscope; some of the Dutchmen who have examined things in it look upon it as one of the wonders of the world."

From W. A. Cornaby, Esq., Wesleyan Mission, Hankow, Central China: "The Microscope ordered by my brother arrived to-day in perfect condition. I am very pleased with it, and shall not fail to recommend your goods to any friends here who may want them."

From F. H. Bowman, Esq., D.Sc., F.R.S. Edin., &c., &c., West Mount, Halifax: "I have much pleasure in bearing testimony to the quality of the $\frac{1}{4}$ in. and $\frac{1}{8}$ in. Objectives in your cheap series. They are most excellent glasses for the price, and answer admirably for Histological purposes. With the $\frac{1}{4}$ in. I have distinctly resolved the first Surirella Gemma on Moller's Test Slide, and with the $\frac{1}{8}$ in. the second Surirella Gemma, which I consider a very good performance."

From Ivo de Carvalho, Esq., Professor at School, Rodrigues Sampaio, Pedagogic Museum, Rua Sacramento, Lisbon: "I am very much pleased with your materials for mounting objects, the complete Dissecting Microscope, the Magnifiers, Mr. Cole's Pattern Section Cutter; they are very good."

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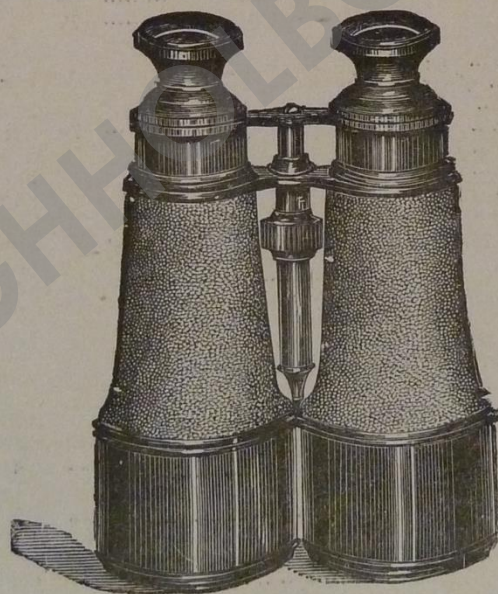
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We have no hesitation in asserting that these Glasses are unsurpassed by any in the world for general outdoor use, Field, Race, or Marine. They have 12 Lenses of most accurate workmanship, perfectly achromatized, the magnifying power in the various sizes is as high as it is possible to comfortably employ, giving in the largest size 6 diameters or 36 times superficial, and in the smaller sizes $5\frac{1}{2}$ and 5 diameters respectively. The field is large and of exceptional brilliancy, and the delineating power enables details of objects to be distinctly seen which would be quite unappreciable with Glasses of less accurate construction, also there is no tendency in these as in so many Glasses to strain the eyes. The workmanship is of the very finest throughout, and we strongly recommend these to anyone desiring the most generally useful Glass for use under all conditions of atmosphere and for all purposes. Shades for sun or spray are provided to the Field Lenses, and the body may be covered in either best black Morocco or Crocodile Skin.

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Included with each is a solid leather sling case.

			£	s.	d.
1501	Premier Binocular Glass, largest size, for extreme long distances, suitable for yachting, &c.; size, when closed, $6\frac{1}{8}$ in. \times 5 in., diameter of object glasses, $2\frac{1}{8}$ in., covered in black morocco or crocodile leather	...	6	0	0
1502	Premier Binocular, object glasses 2 in. diameter, size closed $5\frac{1}{2}$ in. \times 5 in.	...	5	0	0
1503	Premier Binocular, object glasses $1\frac{7}{8}$ in., size closed 5 in. \times $4\frac{3}{4}$ in.	...	4	10	0
1504	Same as No. 1501, in aluminium mounting, covered in russia leather	...	9	10	0
1505	Ditto	...	8	0	0
1506	Ditto	...	6	15	0
	1502 ditto	...			
	1503 ditto	...			

Full Illustrated Catalogue of Binocular Glasses, Astronomical and Portable Telescopes, Barometers, Thermometers, Spectacles, &c., sent post free on application.

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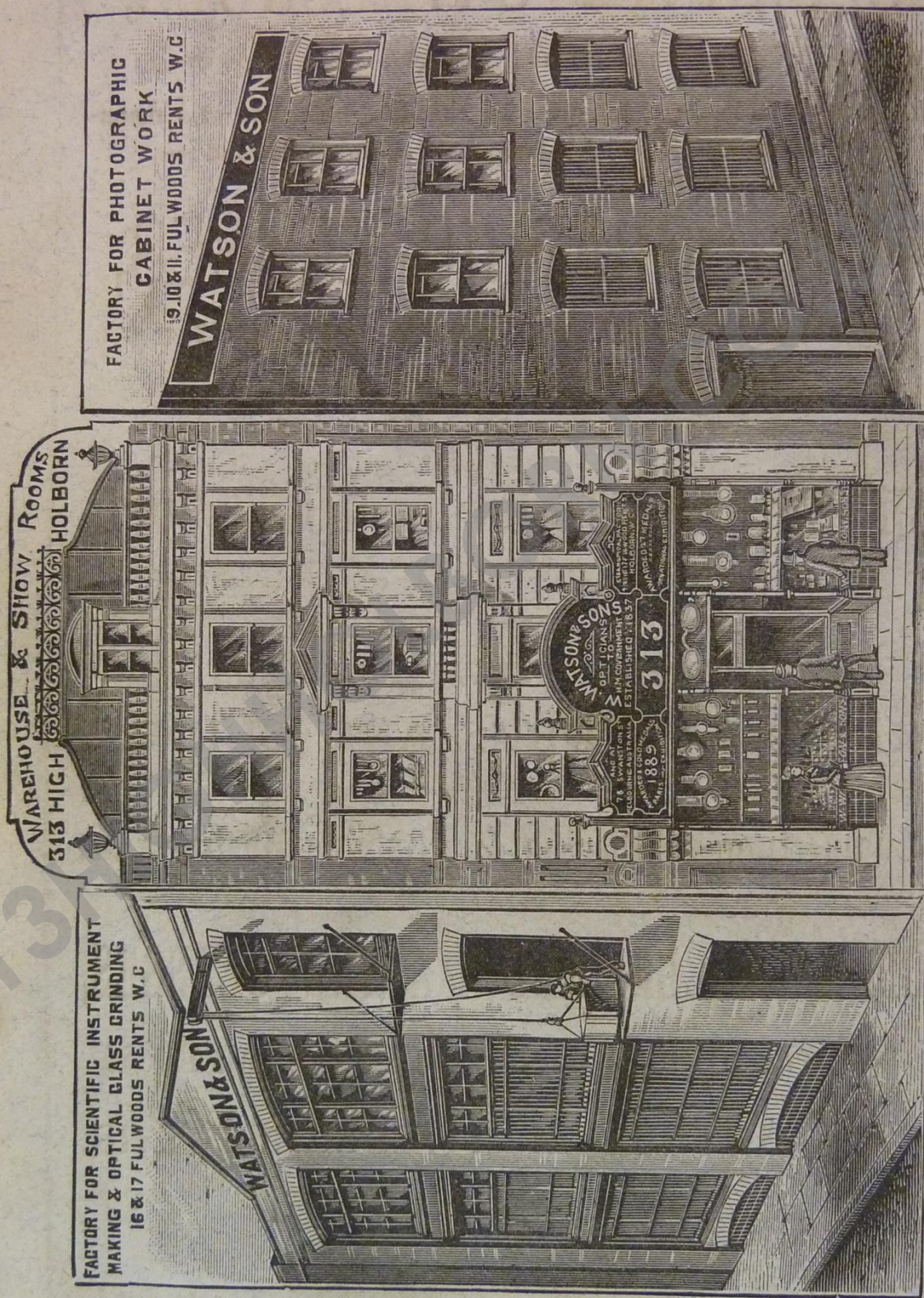
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