

**CATALOGUE OF
MICROSCOPES**



PART 2

MICROSCOPES AND ACCESSORIES

**W. WATSON & SONS, LTD.
LONDON**

36th EDITION

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36th Edition

CATALOGUE
of
WATSON MICROSCOPES
PART 2

Microscope Accessories
for all the Biological Sciences

The Instruments described are suitable for study and research in

AGRICULTURE	CYTOLOGY	PHYSIOLOGY
BACTERIOLOGY	HISTOLOGY	PHARMACOLOGY
BIO-CHEMISTRY	HYGIENE	PHYTOPATHOLOGY
BOTANY	PATHOLOGY	ZOOLOGY

for the work of the amateur and for many technical purposes.

The complete Catalogue of Watson Microscopes is issued as follows:

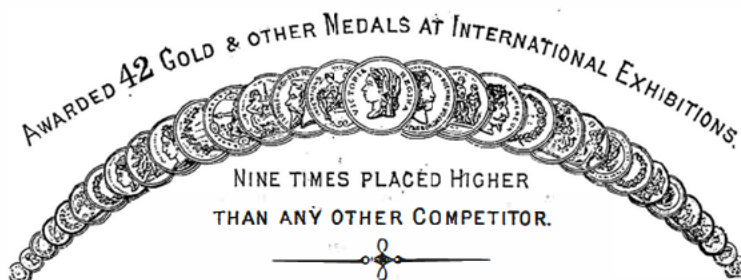
PART 1.	Microscopes, Fittings and Optical Parts.
PART 2.	Microscope Accessories.
PARTS 1 & 2.	Microscopes and Accessories.
PART 3.	Objects for the Microscope.
PART 4.	Metallurgical Microscopes and Accessories.
PART 5.	Photomicrographic Cameras and Accessories.
PART 6.	Petrological Microscopes and Accessories.
PART 7.	Microscopes for Industrial purposes and specialised apparatus.

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Microscope Record, pubd. three times annually, gratis.
Dark Ground Illumination.
Magnifiers and Mountings.
The Book of the Watson Microscope.
Microscopes for Students and Research.

Any of the above will be sent post-free on request.

M9976



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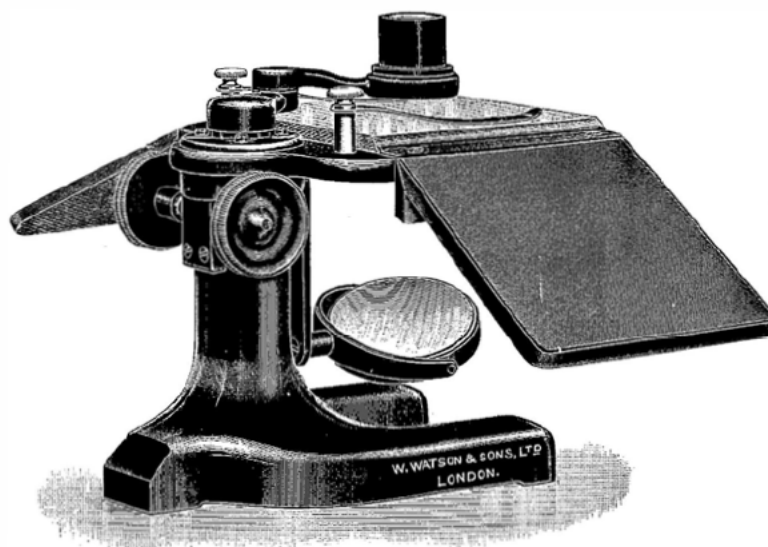
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POLAND.

WARSAW : Inz Feliks Lachman, 3 Szpitalna.

UNIVERSAL DISSECTING MICROSCOPE

As supplied to the "Discovery" Expedition.



This instrument is made with jointed arm, to receive all the aplanatic magnifiers mounted for dissection, listed on page 230. The large horseshoe foot and pillar are one casting and carry a large stage, provided with a bevelled glass plate, below which is mounted a metal plate background.

A plane mirror and opal glass disc are provided in the mirror box, which is mounted independently of the pillar.

Focussing is by means of a rack and pinion adjustment to the lens-carrier arm.

Strong metal hand rests, removable at will, are provided.

It will be noticed that the arm carrying the dissecting lens is doubly jointed, so as to allow the comfortable examination of an object covering the whole area of the stage.

N.B. The arm carrying the dissecting lens has been made specially stout to permit the use of the Porro Prism erector 2205, page 202. This gives an erect image, it can be used with Standard Eyepieces and Objectives. Thus with a $\frac{3}{8}$ inch (16 mm.) Objective and No. 3 Eyepiece, a magnification of about 80 diameters is available and a free working distance of $\frac{3}{8}$ inch a working distance similar to that of the ordinary X20 dissecting magnifier.

PRICES

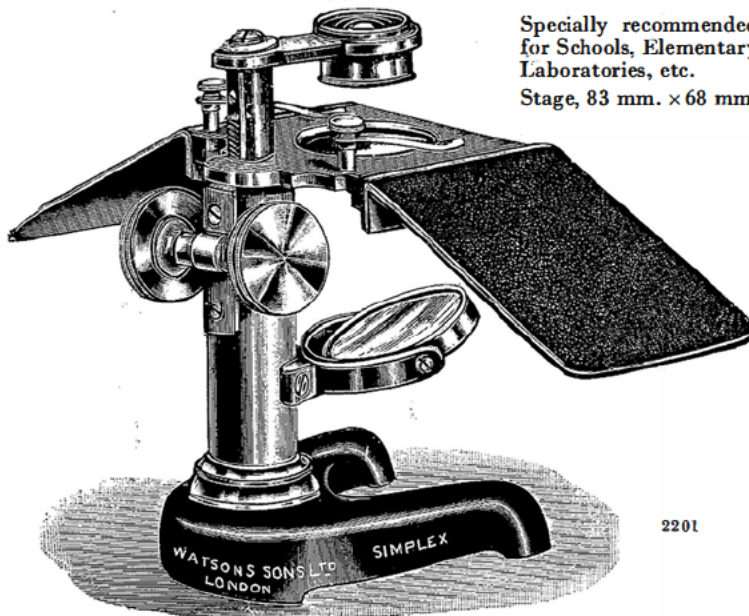
Code Word.	No.				£	s.	d.
Movey	2101	Universal Dissecting Microscope, without lenses	...	...	5	0	0
Mowle	2102	Aplanatic Magnifiers $\times 6$, $\times 10$, $\times 15$ or $\times 20$ ...	...	each	0	15	0

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

"SIMPLEX" DISSECTING MICROSCOPES



Specially recommended
for Schools, Elementary
Laboratories, etc.
Stage, 83 mm. × 68 mm.

Code Word.	No.	PRICES	£	s.	d.
Muffy	2201	This Stand receives all the Aplanatic Magnifiers mounted for Dissecting, listed on page 230. For focussing, it is fitted with a rackwork and pinion adjustment: glass disc for Stage, plane mirror, and matt opal reflector, double-jointed lens arm, complete with hand rests...	2	15	0
Mugle	2202	The above Stand, fitted with simple lens magnifying 8 diameters. Excellent for botanical work ...	3	2	6
Mulay	2203	The above Stand, with one Aplanatic Magnifier, selected from page ...	3	10	0
Multi	2204	The above Stand, with two Aplanatic Magnifiers, selected from page ...	4	0	0

PORRO-PRISM ERECTOR for Dissecting Microscopes

Fits the Simplex and Universal Dissecting Microscopes. Standard Eyepieces and Objectives can be employed. A high magnification combined with long working distance is obtained. Further, the image is seen erect instead of inverted, and dissecting can be carried on with the greatest facility. We recommend the $1\frac{1}{2}$ in., 1 in., and $\frac{3}{4}$ in. Objectives, giving magnifications $\times 35$, $\times 50$, $\times 80$ with ample working distance.



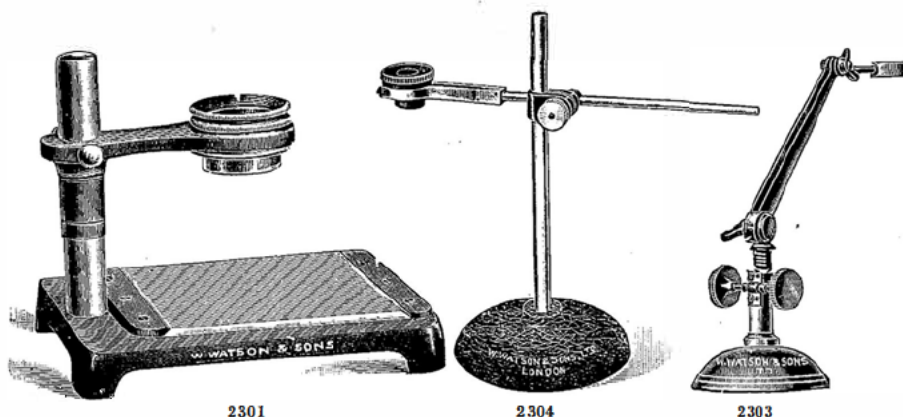
Code Word.	No.	PRICES	£	s.	d.												
Murma	2205	Porro-Prism Erector ...	3	0	0												
<table border="0"> <tr> <td>Saue</td><td>Saue</td><td>Sawde</td><td>Sawfl</td><td></td><td></td></tr> <tr> <td>× 5</td><td>× 6</td><td>× 8</td><td>× 10</td><td>each</td><td></td></tr> </table>						Saue	Saue	Sawde	Sawfl			× 5	× 6	× 8	× 10	each	
Saue	Saue	Sawde	Sawfl														
× 5	× 6	× 8	× 10	each													
Eyepieces																	
Objectives, Argus																	
Parachromatic																	

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DISSECTING LENS HOLDERS



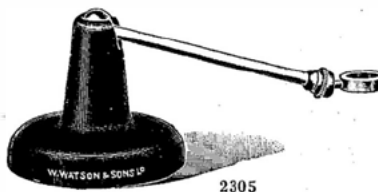
2301

2304

2303

PRICES

Code Word.	No.		£ s. d.
Mumpe	2301	A solid casting metal base 4 in. \times 3 $\frac{1}{2}$ in. with grooves in which a piece of matt opal glass 2 $\frac{7}{8}$ in. \times 2 $\frac{3}{4}$ in. is fitted. Rising from the base is a cylindrical rod on which slides an arm to carry any magnifier in standard dissecting mount. A most popular Dissecting Microscope for elementary Biology, etc. ...	0 10 6
Munch	2302	Single Lens Magnifier for ditto, magnification about 8 diameters	0 7 6
Musha	2303	Magnifier holder with heavy metal base, rackwork focussing and two joints provided with clamps. The Magnifier holding ring rotates around its axis in the socket. Especially valuable for the examination of aquaria, etc. ... This model was supplied for the use of the "Discovery" Expedition.	2 5 0
Musia	2304	Magnifier holder of simple but exceedingly robust construction. Heavy metal base with upright rod. The vertical rod carrying the magnifier can be adjusted vertically, horizontally and rotates in its holder. It is clamped in position by one screw. Magnifiers can be instantly interchanged and are firmly held	0 17 6
Muslo	2305	The "Cantab" Magnifier Holder. As supplied to the University of Cambridge Zoological Department and many other Teaching Institutions. A firm, indestructible holder for hard use. Solid metal casting, cannot be knocked over, adjustment for friction on ball joints. Standard size lens carrier. Two ball joints ...	£1 10 0



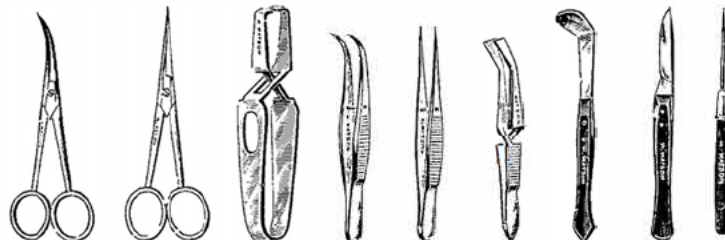
Any of the Magnifiers in dissecting mounts quoted on page 230 will fit the above holders.

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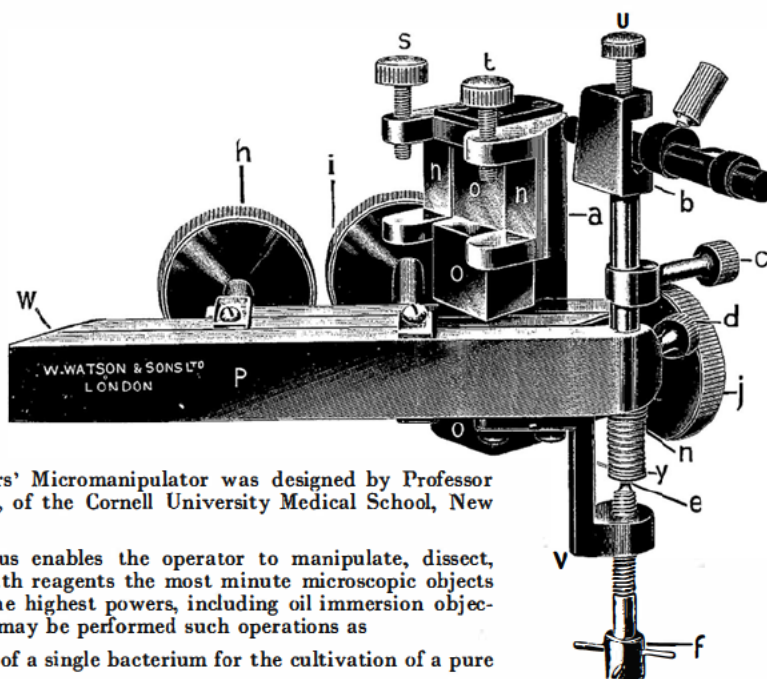
DISSECTING INSTRUMENTS



Code Word.	No.			£	s.	d.
Sacer	2401	Scalpels.	Stainless steel. Flat handles, all sizes...	each	0	6 0
Sache	2402		All metal. Sizes 1 to 6, length of blade ranging between approx. 1 in. to 3 in. ...	each	0	2 0
			Ebony handles. Sizes 1 to 6 ...	each	0	1 9
			All metal, very narrow blade, approx. 2.5 mm. wide ...	each	0	2 0
		Borradaile's Needles,	in wooden handles, suitable for dissection of fine structures, such as the eye ...	each	0	0 9
Sacil	2403	Scissors.	Straight. 4, 4½, 5 in. fine points, open shank ...	each	0	2 6
			5½	each	0	2 0
			6	each	0	2 3
			4	each	0	2 6
		Curved.	4	each	0	2 3
			4½	each	0	2 3
			4	each	0	2 0
			4	each	0	2 0
Seduc	2404	Forceps.	Straight. 5 in. coarse ribbed, blunt ...	each	0	1 6
			4½, 5 in. blunt point ...	each	0	1 6
			4, 5 in. fine point, milled at end ...	each	0	2 0
			4½ in. needle point ...	each	0	2 0
			5	each	0	2 3
		Curved.	4½ in. fine points ...	each	0	2 0
			Cover glass, flat ends, straight ...	each	0	2 3
			Cover glass, flat ends, cross action ...	each	0	3 0
			Cornet's pattern for holding slides and cover glasses ...	each	0	2 0
Sedox	2405	Bone Forceps.	Liston's Bone Forceps, 5½ in. with spring ...	each	0	6 9
			" " " 7 in. ...	each	0	7 6
			" " " 8 in. ...	each	0	8 6
			" " " 9 in. ...	each	0	9 6
			Horsley's Bone Forceps, 7½ in. prismatic points ...	each	0	14 6
Sagin	2406	Needles.	Rosewood handles, ferrules, straight fine points ...	each	0	0 4
			Rosewood handles, ferrules, curved fine points ...	each	0	0 5
			Rosewood handles, ferrules, curved blunt points ...	each	0	0 5
			Unvarnished wood handles without ferrule, per gross 21/-	each	0	0 2
Salac	2407	Needleholder,	all metal, nickel plated ...	each	0	1 9
			all metal, nickel plated, with clamping screw ...	each	0	2 6
Salam	2408	Section Lifter.	Double ended, nickel plated ...	each	0	3 6
			Single ended, nickel plated ...	each	0	1 0
Salea	2409	Chain Hooks.	Set of 3 ...	each	0	3 0
Salic	24010	Blow Pipe.	Nickelled, with stillito ...	each	0	1 6
Salpi	24011	Razor.	Flat on one side, hollow ground on the other ...	each	0	2 9
Pream	24012		Cole's pattern Section Knife with fixed steel handle ...	each	0	8 6
Sedow	24013	Strops.	8 in. double sided leather, flat, in case ...	each	0	1 6
Sedoq	24014	Canvas Roll,	fleece lined, to hold instruments, one size only ...	each	0	3 6
Sedat	24015	Set of Dissecting Instruments	in canvas roll, containing 1 scalpel, 1 straight scissors, 1 straight forceps, 2 dissecting needles...	each	0	8 6
Sedam	24016	Set of Dissecting Instruments	in canvas roll, containing 1 razor, 1 scalpel, 1 straight scissors, 1 straight forceps, 2 dissecting needles, 1 section lifter ...	each	0	11 6
Sedar	24017	Set of Dissecting Instruments	in canvas roll, containing 1 razor, 2 scalpels, 1 straight scissors, 1 curved scissors, 1 straight forceps, 2 needles blunt points, 2 needles fine points, section lifter ...	each	0	15 0
Sedol	24018	Set of Dissecting Instruments	in canvas roll, containing 1 razor, 2 scalpels, 1 straight scissors, 1 curved scissors, 1 straight forceps, 1 curved forceps, 2 needles blunt points, 2 needles fine points, 1 section lifter, 1 blowpipe ...	each	0	17 6
Sedop	24019	Set of Dissecting Instruments	in wooden case, 2 forceps, 3 scissors, 2 scalpels, seeker, section lifter, blowpipe, 2 needles, 1 razor, chain hooks ...	each	1	7 6

DISSECTION APPARATUS

CHAMBERS' MICROMANIPULATOR



The Chambers' Micromanipulator was designed by Professor Robert Chambers, of the Cornell University Medical School, New York.

This apparatus enables the operator to manipulate, dissect, isolate or treat with reagents the most minute microscopic objects with the aid of the highest powers, including oil immersion objectives. By its aid may be performed such operations as

The isolation of a single bacterium for the cultivation of a pure strain.

The dissection of the structure of a cell or of its nucleus.

The treatment with reagents of a single cell in a tissue living *in vitro*.

The success of the apparatus is due to the avoidance of bearings. The needle is carried by a mechanism consisting of stout lever-bars (p, o) connected by stiff spring steel plates (w). These bars are operated by screws with milled heads (h, i, j) below the level of the stage. The movements of the needle point are in arcs which, under the microscope, appear straight. The extent of the movement is about 3 mm. The needle is set by means of clamps (b, c) and adjusting screw (f).

The illustration shows an instrument for the left hand with clamp (n, n) to attach it to a square plain stage such as is fitted to the "Service" microscope.

A similar instrument, but reversed in arrangement, is made for the right hand, so that two needles or a needle and a capillary pipette may be employed simultaneously. When attached, the two instruments are quite clear of the illuminating accessories or other parts of the microscope.

The right-hand instrument is also supplied with a rigid pillar rising from a large metal base upon which the microscope is clamped (B 4061). For bacteriological use a single instrument will usually suffice, but for work on cells in tissue two instruments are indispensable. The operation of the two instruments simultaneously is effected without any extra difficulty, and the technique is readily acquired owing to the simple and direct action.

Chambers' Micromanipulator has been commended by those who have used it as an instrument with which the most delicate dissections may be performed with considerable facility.

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		PRICES		£ s. d.	
Code Word.	No.				
Scena	2601	1 pr. Micromanipulator Instruments , right and left-handed, for clamping to stage of Microscope		22	10 0
Scent	2602	1 pr. Micromanipulator Instruments , consisting of left-handed instrument, for clamping to stage of Microscope, together with one metal base with vertical pillar rising therefrom and carrying the right-handed Dissecting Instrument independently of the Microscope, this being fitted with syringe plunger and coil for injection work. Specific metal wire control to right-handed Dissecting Instrument on one screw. Base drilled in four places and provided with clamps to permit the use of any Microscope, upright rigid pillar and adjustment for height of Microscope stage, two instruments complete ...		30	0 0
Scept	2603	Special Wax , for securing needle to injection coil, and for securing syringe to coil per oz.		0	2 6
Schen	2604	Separate Shelf for attachment to Microscope where stage is too small to permit the direct attachment of the Dissection Apparatus, complete with screws and instructions for attachment		1	0 0
(The thickness of the Microscope stage must be stated at time of ordering, and the dimensions of the stage given. The distance between the optic axis of the Microscope and front of the stage must be given.)					
Scher	2605	Separate Shelf for attachment to Microscope for circular stage		1	5 0
(Same measurements also required.)					
Seama	2606	Flexible Shaft to control any one of the milled heads of the Microscope (unless ordered at the same time as the instrument the milled heads must be returned for the necessary attachment)		2	10 0
Seamy	2607	Special Moist Chamber for use with the instrument; depth 8 mm., size of chamber $1\frac{1}{2}$ in. \times $\frac{7}{8}$ in., mounted on thin slips, complete with supply of cover glasses		1	10 0
Secon	2608	Special Condenser for use with above, fully mounted, and with dark ground stops		10	0 0

Descriptive pamphlet of the above Instrument will be sent on request.

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BLOOD TESTING APPARATUS

Code Word. No.
Muted 2701

Ehrlich's Eyepiece with square adjustable diaphragm, for estimating the relative proportion of red and white blood corpuscles in dry preparations

£ s. d.

2 10 0



Pabac	2702	Thoma Haemacytometer, complete, consisting of open or closed cell counting chamber with Thoma ruling, two plane cover glasses, pipettes for white and red corpuscles in case	2 2 0
Hafar	2703	Haemacytometer complete with counting chamber 0.2 mm. in depth and Fuchs Rosenthal ruling in case	2 2 0
Pabol	2704	Haemacytometer complete but with double all Burkner counting chamber, in case	2 12 6
Metha	2705	Metal clips for holding cover glass, extra	0 4 6
Cochx	2706	Counting chamber only, single cell, open or closed 0.1 mm. deep	1 2 0
Conhx	2707	" " " 0.2 mm. deep	1 2 0
Codhx	2708	" " " double all Burkner, without clips	1 11 6

The above counting chambers may be supplied with the following rulings:

Thoma—Turck—Improved Neubauer. Fuchs Rosenthal.

Counting chambers with special rulings or cell depths can be made to order. Prices on application.

N.B. The maximum error in the counting chambers does not exceed 0.001 mm.

Pacha	2709	Pipettes. Red cell pipette giving dilution 1—100	0 5 6
Pachx	27010	White " " " 1—10	0 5 6
Pacif	27011	Cover Glasses. Optically plane cover glasses, per pair	0 1 6

HAEMAGLOBINOMETERS

Myrox	27012	Gower Haemaglobinometer, with permanent glass standard in comparator box, 20 cm. pipette, drop bottle, lancet complete in case	1 17 6
Paint	27013	Sahli Haemaglobinometer with permanent glass standard in comparator box, 20 cm. pipette, acid bottle, lancet and dropper, complete in box	1 17 6
Paget	27014	Haldane Haemaglobinometer with authorised C.O. Blood standard graduated tube 20 cm. pipette, 12 lancets, complete in case	1 10 0
Pacio	27015	Carbon Monoxide Haemaglobinometer (Haldane Method) with permanent glass standards instead of blood standard for use in either day or electric light, in special comparator, complete with 20 cm. pipette, drop bottle, lancets in case	3 3 0
Paglx	27016	Haldane standard tube only	0 7 6
Pagld	27017	" " graduated tube only	0 2 6
Paglo	27018	Gower permanent glass standard in comparator box	1 2 6
Paglm	27019	Sahli " " " " "	1 2 6
Pagls	27020	Graduated tube only for Sahli or Gower haemaglobinometers	0 2 6

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Panpo	28040	TURCK, F. B. "The Action of the Living Cell"	...	0 18 0
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Panes	28041	ASH, E. "Ants, Bees and Wasps"	...	0 1 0
Pashy	28042	ASH, E. "British Spiders"	...	0 1 0
Pango	28043	ASH, E. "Pond Life"	...	0 1 0
Pawea	28044	GILTNER, W. "An Elementary Text Book of General Microbiology"	...	0 15 0
Panid	28045	HAWKS, Capt. "The Microscope shown to the Children"	...	0 3 6
Panod	28046	COOKE, A. "Insects shown to the Children"	...	0 3 6

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BOOKS *Continued*

		GENERAL BIOLOGY		£	s.	d.
Code Word.	No.					
Panle	28047	KELMAN, J. H. "Butterflies and Moths shown to the Children"	...	0	3	6
Panto	28048	HAWKS, Capt. "Bees shown to the Children"	...	0	3	6
Pavum	28049	JOHNSTONE, SCOTT & CHADWICK. "Marine Plankton"	...	0	12	6
Panos	2901	MANGHAM & RAE SHERRIFFS. "A First Biology"	...	0	6	0
Pamax	2902	NERDHAM, JAMES G. "Guide to the Study of Freshwater Biology." Illustrated keys and tables	...	0	5	0
Paux	2903	PLASKITT, F. "Microscopic Freshwater Life"	...	0	13	6
Panox	2904	KELMAN, J. H. "The Sea Shore shown to the Children"	...	0	3	6
Panit	2905	SHIPLEY. "Hunting with the Microscope"	...	0	8	6
Panno	2906	SMALL, Prof. "Pocket Lens Plant Lore," month by month	...	0	5	0
Parxe	2907	SMITHSON. "Pond Life" Algae	...	0	2	0
Paxg	2908	STEP, E. "Ants, Bees and Wasps and Allied Insects of the British Isles"	...	0	10	6
Pauyl	2909	WARD & WHIPPLE. "Fresh Water Biology"	...	1	16	0
Pauyx	29010	WATSON BAKER, W. E. "World beneath the Microscope"	...	0	5	0
Pawog	29011	WOOD. "Common Objects for the Microscope." Edition with coloured plates	...	0	3	6
DIATOMACEAE						
Pamid	29012	BROWN, N. E. "A Monograph on the Arachnoidiscus"	...	0	6	0
Pamle	29013	LAPORTE & LEFEBURE. "Diatomées Rares et Curieuses," 2 vols. 30 plates (heliogravures) 1930-1931	...	4	14	6
Pamer	29014	TAYLOR, F. G. "Notes on Diatoms"	...	0	15	0
Pamto	29015	MILLS, F. W. An Index to the Genera and Species of the Diatomaceae, and their Synonyms 1816-1932, consisting of bibliography and index from "Acanthoceres" onwards in about 15 separate parts, each part	...	0	10	0
PETROLOGY						
Pasot	29016	HARKER, A. "Petrology for Students"	...	0	8	6
Pasox	29017	BARKER, T. V. "The Study of Crystals." A General Introduction	...	0	8	6
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Pasan	29019	EVANS, J. W. "The Determination of Minerals"	...	0	7	6
Pasce	29020	EVANS, J. W., and DAVIES, G. M. "Elementary Crystallography"	...	0	7	6
Pavan	29021	HATCH & WELLS. "Petrology of Igneous Rocks"	...	0	15	6
Pasci	29022	HOLMES, Prof. A. "Nomenclature of Petrology"	...	0	7	6
Pasdo	29023	HOLMES, Prof. A. "Petrographic Methods and Calculations"	...	0	15	0
Pasom	29024	GREY, E. C. "Practical Chemistry by Micro Methods"	...	0	4	6
Pasma	29025	JOHANNSSEN. "Petrological Methods"	...	1	15	0
Pasnl	29026	MILNER, H. B. "Methods in Practical Petrology"	...	0	3	6
Paspa	29027	MILNER, H. B. "Sedimentary Petrography"	...	1	1	0
Parlo	29028	RHODES. "Micropetrology for Beginners"	...	0	3	0
Pasqu	29029	RUTLEY. "Elements of Mineralogy"	...	1	15	0
Pasq	29030	RUTLEY. "Mineralogy." Revised by H. H. Read	...	0	6	0
Pasro	29031	SHAND, S. J. "The Study of Rocks"	...	0	6	0
Passo	29032	WINCHELL, N. H. and A. N. "Elements of Optical Mineralogy," Part I.	...	0	17	6
METALLOGRAPHY						
Paumo	29033	BAMFORD, T. G. and HARRIS, H. "The Metallurgist's Manual"	...	0	15	0
Pausl	29034	BERGLUND, T. "Metallographers' Handbook of Etching"	...	0	12	6
Powow	29035	GREAVES, R. H. and WRIGHTON, H. "Practical Microscopical Metallography"	...	0	18	0
Parag	29036	HOWE. "Iron, Steel and Other Alloys"	...	1	10	0
Paric	29037	OSMOND & STEAD. "Microscopic Analysis of Metals"	...	0	10	0
Paupe	29038	REED, EVERETT, L. "Photomicrographs of Iron and Steel"	...	1	0	0
Parod	29039	SAUVEUR. "The Metallography of Iron and Steel"	...	2	2	0
TEXTILES.						
Paswo	29040	MATTHEWS, J. MERRITT. "The Textile Fibres, their Physical, Microscopical and Chemical Properties"	...	2	10	0
Pasxe	29041	ASTBURY, W. T. "The Fundamentals of Fibre Structure." An introductory study in X-rays and Molecular Interpretation. <i>In the press</i>	...			
PHOTO-MICROGRAPHY.						
Paulo	29042	BARNARD, J. E. and WELCH, F. E. "Practical Photomicrography" 1936 Edition	...	1	1	0
Pasty	29043	HIND, H. L. and RANGLES, W. B. "Handbook of Photomicrography"	...	0	16	0

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

LAMPS—ELECTRIC

For Visual Purposes

The fuller appreciation of the value of condenser technique and illumination referred to in Part I. of this catalogue has led to a revival of interest in the many forms of lamps and lamp mountings now available. For some years past, Watsons have endeavoured to meet the requirements of microscopists and to build lamps to suit their individual needs. From the experience so acquired, a fresh series of lamp mountings has been standardised which it is expected will meet the wishes of all workers. Watsons are always ready to build special housings to meet the convenience of their clients.

PRICES

Code Word.	No.		£	s.	d.
Phami	2101	The Service Lamp. For university and school laboratory. Constructed of stout metal and finished in stoved black enamel. A bayonet fitting mounted in the top, carries a gas-filled electric bulb suitably grained to diffuse the light. There are two openings, one is hooded so that no light reaches the observer's eyes and ensures deflection of light to the text book, while the other is slotted to receive an iris diaphragm or filter holder at a later date as required. Total height 175 mm. and height to centre of apertures 85 mm.		0	15 0
Phleb	2102	Iris diaphragm mounted to fit lamp		0	15 0
		Colour filters, blue, blue-green, green, yellow, ... each		0	1 6
Phalp	2103	The Universal Lamp. For general microscopy. The lamp consists of a cylindrical metal housing, suitable for lamps up to 100 c.p. Provision is made for adjustment in height and for correct angling in relation to the mirror. It can be used for transmitted light, opaque and dark ground illumination.			
		Price, complete on stand with 60-watt lamp, flex and plug, ...	3	0	0
Picul	2104	The Projector Lamp. This small lamp, which was originally designed for use with opaque subjects and binocular dissecting microscopes is, owing to its compactness, very useful for general microscopy. It is fitted with a lens system which projects a concentrated beam of light upon the mirror or object, and the swivel joint permits its direction to be fixed as desired		1	5 0
Merge	2105	Resistance for 100-125 volts		1	7 6
Mergi	2106	Resistance for 200-250 volts		1	17 6
Welch	2107	The Welch Lamp. Described in J.R.M.S. In this lamp an ordinary filament bulb can be used in such a way that no stray light reaches the observer's eyes. The beam from the filament is internally reflected in a glass rod where it is directed to the microscope mirror. The carrier for the glass rod is adjustable to correspond with the height of the filament in the lamp bulb, and the whole lamp housing can be tilted and retained in position with a clamp. It is mounted on a solid cast frame, and is a lamp especially suitable for high power microscopy		3	10 0
		Extra rods ... each		0	4 6
Vrill	2108	The Vrill Lamp. This lamp is designed for dark ground illumination, projection drawing and for photomicrography with the various eyepiece cameras now available. The bulb is of the latest 5-amp. low voltage type with spiral filament. The mounting includes a condensing system, focussing adjustment to lamp, and adjustment for height and inclination. The bulb is included in the price, together with 3 ft. flex		3	13 6
Vrall	2109	Extra for iris diaphragm and colour filter holder, to carry two filters		2	5 0
Vroll	21010	“ for iris diaphragm alone		1	5 0
Vrell	21011	“ for transformer		1	17 6
Lopol	21012	The Greenough Lamp. Light projected from the mirrors of modern large field dissecting microscopes is difficult of precise control, and often the paired objectives are not evenly illuminated. The Greenough lamp is designed to rest on the table beneath the microscope stage in place of the mirror, and an evenly illuminated field results. The lamp housing consists of a solid finned casting and provision is made for centring the filament. Complete with 15-watt lamp and diffuser ...		1	1 0

N.B.—Please specify voltage when ordering. The Vrill lamp cannot be used on direct current.

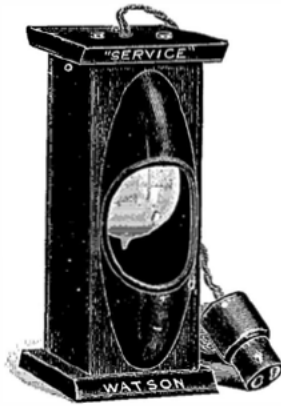
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LAMPS—ELECTRIC

"SERVICE"



2101



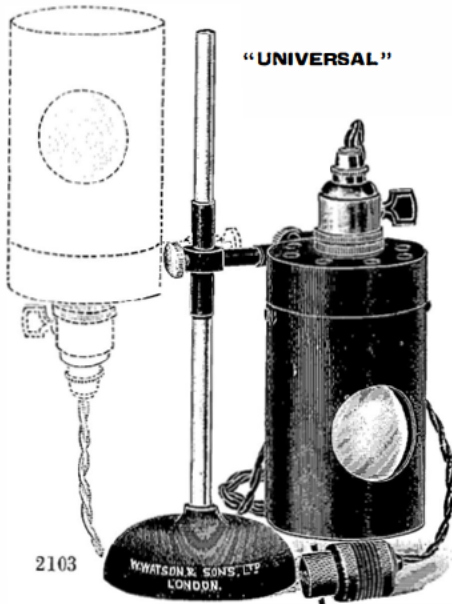
2102

"PROJECTOR"



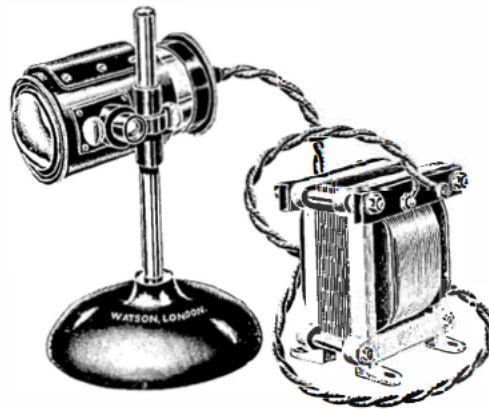
2104

"UNIVERSAL"



2103

"VRIL"



2108

"WELCH"



2107

"GREENOUGH"



2102

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313 HIGH HOLBORN, W.C.

LAMPS—ELECTRIC

FOR PHOTOMICROGRAPHY, PROJECTION, ETC.

RESEARCH LAMP

£ s. d.

Code Word.	No.	RESEARCH LAMP	£ s. d
Sabor	2121	The illustration shows a form of mounting which has found considerable acceptance among microscopists who appreciate the importance of having the fullest control of their illuminant and wish to avail themselves of the full potentialities of their optical equipment. Mounted upon a solid pillar the optical bench limb can be inclined to any convenient angle. The Lamp in its housing is fixed at the upper end while the condenser, with its centring mounting, iris diaphragm may be accurately focussed by means of the rack and pinion. Filter carrier can be mounted on mirror tail piece.	
		Research Lamp , housing suitable for Pointolite, Ribbon filament or pearlite bulb having heavy base with rigid pillar, optical bench with rack work condenser fitting.	12 0 0
Sarob	2122	Condenser fitting with centring screws.	2 5 0
Sarox	2123	Lamp Condenser, Nelson pattern, optical part suitably mounted with iris,	2 5 0
Saraw	2124	* " " Macro " " " " " " " "	4 5 0
Saray	2125	" " " Watson-Conrady " " " " " "	6 10 0
Saraz	2126	Double filter carrier for filters 2" x 2"	1 15 0

N B.—These Condensers being Achromatic as well as Aplanatic are particularly recommended for use with Apochromatic or Fluorite Objectives and for Photomicrography.

POINTOLITE BULBS AND RESISTANCES

The starting device employed with this lamp necessitates the purchase of the special resistance quoted with the bulbs. The advantages of the Pointolite are : a point source of light—steady illumination—concentration—relative freedom from heat.

For Direct Current:—2 electrode type.

Sangu	2127	30 c.p. Ionising current 4-5 amps. consumption, 0-45 amps., bulb only	1 10 0
Sanil	2128	100 c.p. " " 7 " " 1-35 " "	1 10 0
		Resistances	
Sanca	2129	For use with 30 c.p. lamp } State voltage when ordering	{ 3 12 0
Sanig	21210	" " 100 c.p. } 3 electrode type.	{ 3 12 0
Sause	21211	500 c.p. Ionising current 7 amps. consumption 0-6 watt c.p. bulb only	2 10 0
Sapid	21212	1000 c.p. " " 7 amps. 0-5	3 10 0
Santo	21213	Resistances for use with 500 c.p. lamps. Low voltage £9 10 0 4022b high voltage	12 10 0
Supon	21214	" " 1000 c.p. " £13 10 0 4023b	14 15 0

For Alternating Current, 150 c.p. type only manufactured.

Surub	21215	150 c.p. ionising current 7 amps., consumption 2 amps., bulb only	...	...	1 10 0
Sarca	21216	Resistance for use with the above	...	...	4 4 0
Extras, reflectors, clips, holders etc. if required supplied at catalogue prices.					

ARGUS ARC LAMP

Phase	21217	Specially designed for ultramicroscopy, photomicrography and projection or any work where a particularly intense or richly actinic light source is required. The carbons are mounted at right angles, the lamp consumes only 8 amps. Independent carbon feed. Simple and compact mounting. With hood, condensing lens, pillar and massive base . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	4 10 0
Phela	21218	Extra for clockwork automatic drive to carbons . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	4 0 0
Phiat	21219	Resistance for Argus Arc lamp, 100 v. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	1 10 0
Phono	21220	" " " " " 200—250 v. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	1 10 0
Piuuo	21221	Carbons for Arc Lamp, 25 cms. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	0 10 0

RIBBON FILAMENT LAMP for Alternating Current only

Provides an intense, defined, textureless and steady source of light. Critical illumination as from the lamp flame edge is obtainable. The filament is an actual ribbon of tungsten.

Sano	21222	Actual ribbon or tungsten Price for bulb only 6 v. 18 amps. (This bulb can be mounted in the housing of the Universal, Welch or Research lamps)	1 10 0
Sanig	21223	Transformer for use with the ribbon filament lamp, specify voltage	3 0 0
Sanag	21224	6v. 9 amps bulb, as foregoing	1 0 0
Sanag	21225	Transformer for above	2 15 0

SUPPLEMENTAL PRECISION MOUNTING

In Photomicrography the need of a mounting providing mechanical means for adjusting the lamp for height and centring the source of light accurately to the optical system is often felt. This mounting fulfils all requirements.

The pillar is exceedingly rigid and mounted thereon is a wide rack. Centring arrangements are spring loaded and give an immediate and positive response both vertically and horizontally.

N.B.—When mounted in conjunction with an arc lamp this mounting is perfection both for Projection and Photomicrography.

Sabil	21226	Precision Mounting as figured to accommodate any lamp hood or lamp mounting, including solid base or 45° saddle for triangular bar	15	10	0
Sabix	21227	If supplied without base or saddle for triangular bar	14	5	0

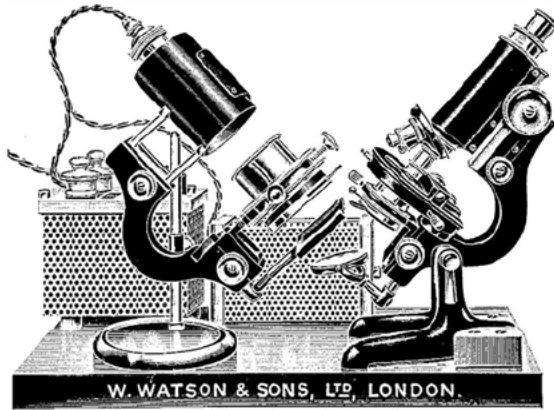
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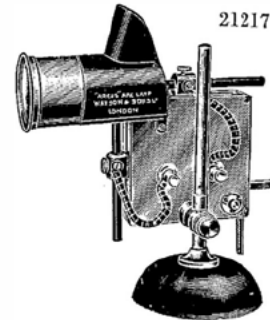
LAMPS—ELECTRIC

RESEARCH LAMP



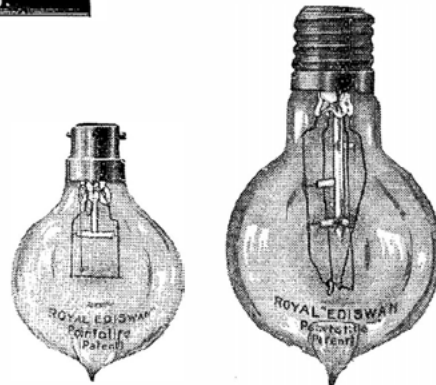
2121

ARGUS ARC LAMP



21217

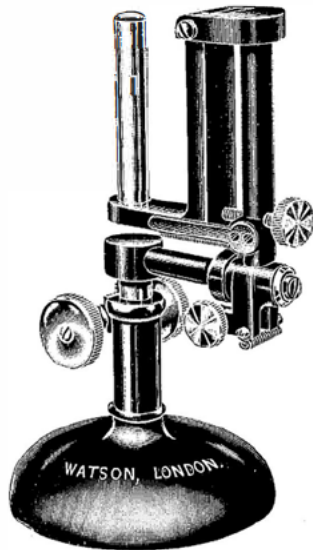
POINTOLITE BULBS



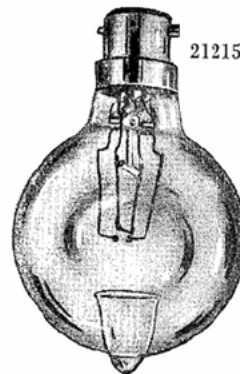
LAMP, TYPE "A"

LAMP, TYPE "B"

PRECISION MOUNTING



21226



21215

A.C. LAMP, 150 c.p.

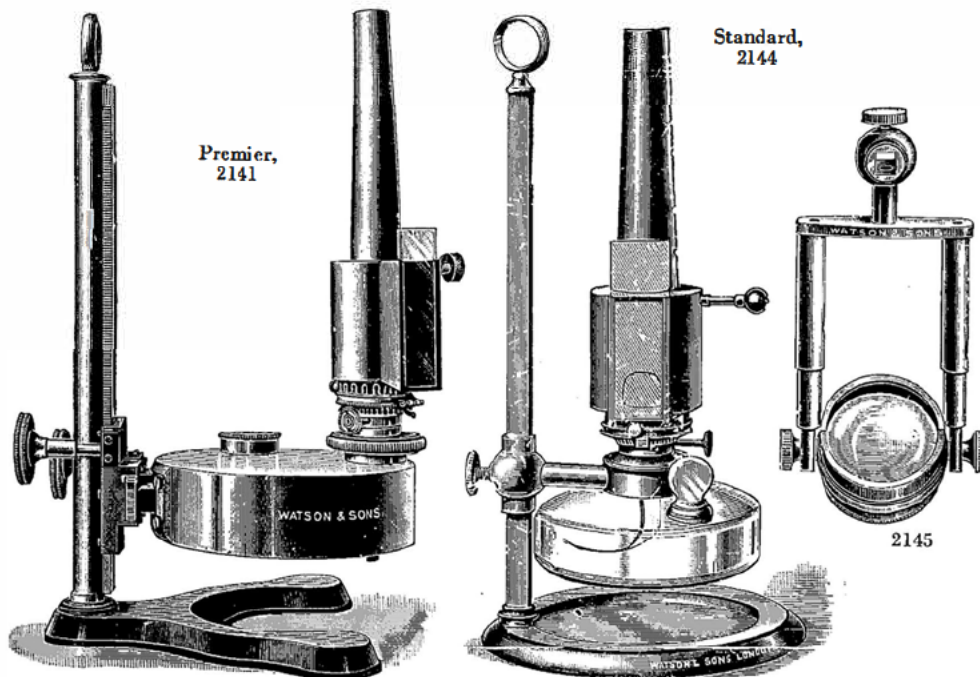
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313 HIGH HOLBORN, W.C.

LAMPS—OIL

Code Word.	No.	PRICES	£	s.	d.
Pigme	2141	PREMIER. Highest class microscope lamp with rack-work and screw movements fitted to the upright bar in vertical and horizontal directions by which means the light can be exactly adjusted. Large solid brass foot, brass container, rotating burner so that the flat or edge of the flame may be used. With metal chimney for $3 \times 1\frac{1}{2}$ in. slips...	10	10	0
Pilfy	2142	Nelson Aplanatic Bull's Eye Condenser, mounted on arm attached to oil container with sliding focussing adjustment, etc. extra	2	10	0
Pinoe	2143	Mahogany Case for lamp, with handle, lock and key ...	1	10	0
Pirag	2144	STANDARD. It has a flat glass reservoir, which allows of the light being brought close to the table. The lamp itself may be securely fixed at any height on the upright bar, which latter being square, prevents it from swinging round. A metal chimney, taking $3 \times 1\frac{1}{2}$ slips, is provided. This lamp will burn for 10 hours. With supply of blue and white slips ... This Lamp can be used as an illuminant for Photo-Micrography, providing a suitable time for exposure is given.	1	10	0
Pishi	2145	Ditto, ditto, fitted with Nelson's Aplanatic Bull's-Eye Condenser. This is mounted in the manner illustrated, Fig. 2145, and fits the bar of the lamp stand; means of focussing are provided.			
Pilot	2146	Iris diaphragm fitted to Bull's-Eye 2145 ...	1	5	0
Pitel	2147	Case for No. 2144 ...	1	0	0



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THE MERCURY VAPOUR LAMP

For
MICROSCOPE
WORK,
MEDICO LEGAL
PURPOSES,
COMPARATOR
WORK,
Etc., Etc.

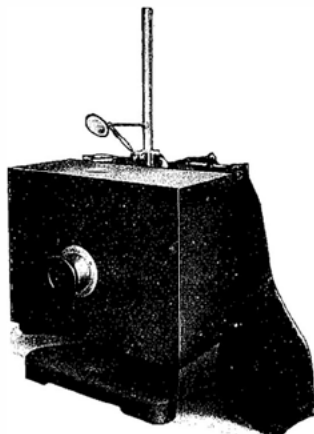


FIG. 1.

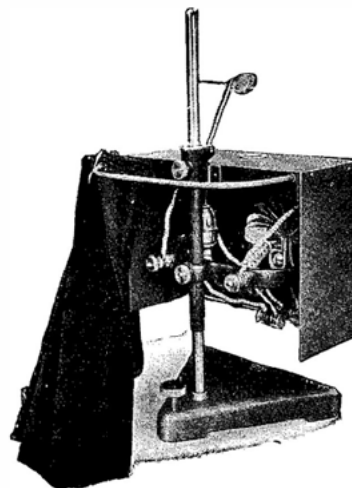


FIG. 2.

Mercury Vapour Lamp with fused quartz tube, which provides an absolutely steady monochromatic light of high intrinsic brilliancy for general microscopical observations, photomicrography, and visual work of all kinds.

Mr. Barnard has for years employed this type of lamp for his most exacting researches and dark ground illumination. When mounted upon a board with fixed prism the ideal outfit for rapid diagnosis by dark ground illumination is available.

Its intrinsic intensity and monochromatic light makes it ideal for the Photomicrographer who can utilise his screens under theoretically perfect conditions.

The M.V. Lamp also provides a very rich source of Ultra-Violet radiation for research work in the invisible region of the Spectrum.

Its salient features are:—

1. The fused quartz burner is not exhausted but is at all times freely vented to the atmosphere.
2. No mechanical devices are required for starting the arc.
3. When the lamp is not in operation, the quartz burner tube is completely filled with mercury, and may be transported from place to place without any risk of damage to the burner through hammer action of the mercury contents.
4. The life of the lamp is practically unlimited. The burner can be lowered, raised or rotated on a vertical rod, fixed to a heavy tripod base. It can also be tilted. The metal housing carries a condenser tube and iris diaphragm in the front. A small silvered mirror fitted above an aperture in the roof of the housing enables both vertical and horizontal beams to be employed.

The K.B.B. Lamp may be operated off any current supply, provided a series resistance is used to suit the existing voltage.

Code Word.	No.		£	s.	d.
Seaba	2151	K.B.B. mercury vapour lamp, direct current, with triangular base, upright pillar, clamp, metal casing and curtain, iris diaphragm	20	0	0
Seadi	2152	Resistance for 100/150 volts	1	19	3
Seafo	2153	Resistance for 150/250 volts	3	2	0
Scarp	2154	Glass Screen to reduce light intensity	0	10	6
Seaco	2155	K.B.B. Mercury Arc Illuminant, with transformer for alternating current, with three electrode evacuated type A.C. quartz burner, resistances, etc.	35	0	0

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313 HIGH HOLBORN, W.C.

CONDENSERS—STAND

THE WATSON-CONRADY ACHROMATISED APLANAT

This is the most perfect combination for every form of work where a condenser is employed. Achromatised and Aplanatised it ensures a solid and colour-free beam reaching the microscope condenser, enabling both that and the objective to develop their capabilities under ideal conditions. Photomicrographically it ensures images free from colour fringes and reduction in exposure. It utilises all rays from the illuminant and is specially suitable for use with modern small light sources.

Code Word.	No.		£	s.	d.
Perfi	2161	Mounted on massive stand with extensible pillar, centring screws and Iris diaphragm. Similar to illustration No. 2165	9	10	0
Perke	2162	Mounted as No. 2169	6	5	0

APLANATIC NELSON FORMULA

The computation of this lens system provides a brilliant and even circle of light with a minimum of spherical aberration. It is a great improvement upon the ordinary Bull's Eye Condenser and should be preferred wherever possible.

Code Word.	No.		£	s.	d.
Pence	2163	Aplanatic Condenser, mounted as No. 2169	2	0	0
Pends	2164	With Iris Diaphragm extra	1	5	0
Peony	2165	Ditto, mounted on upright heavy stand (as figured) with lengthening bar and clamp screws, lenses fitting in ring having centring screws, and clamp screw to fix centring, specially arranged for photography, projection, etc.	4	0	0
Perdi	2166	Ditto, ditto, with Iris Diaphragm. This is a most important addition, and enables a clear and evenly illuminated disc to be obtained when photographing, etc.	5	5	0

THE SCÖP LONG FOCUS CONDENSER

Fitted with a lens $2\frac{1}{8}$ in. diameter, it is of value for use in Photomicrography, and where a vertical illuminator is employed. An Iris diaphragm is included to control the diameter of the emergent beam. Latitude for adjustment is provided by a sliding motion horizontally, extensible pillar vertically, both with clamps.

Code Word.	No.		£	s.	d.
Pegif	2167	As illustrated	3	15	0

The **Scöp Long Focus Condenser with Mechanical Adjustments** provides rapid and precise adjustments to facilitate the most perfect performance of the vertical illuminator. Adjustment for height is extensive and precise and is effected by rack and pinion. Horizontal movement is controlled by screw motion. A substantial tripod foot ensures great stability.

Code Word.	No.		£	s.	d.
Philo	2168	As illustrated	8	10	0

STANDARD PATTERN STAND CONDENSER

Pelvis	2169	With upright lengthening pillar and ball and socket motions, large size, as illustrated	1	7	6
Penat	21610	Ditto, medium size	1	2	6
Penal	21611	Ditto, small size	0	16	6

LENS FOR UNIVERSAL STAND

Penba	21612	Lens $2\frac{1}{8}$ in. diameter with stem to fit socket of Universal Stand 2182, shown on page 218	0	15	0
Penno	21613	Extra for Iris Diaphragm	1	5	0

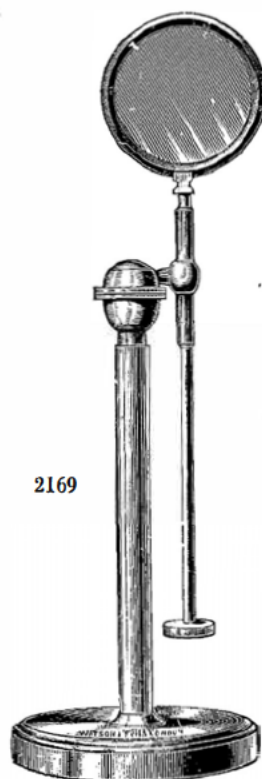
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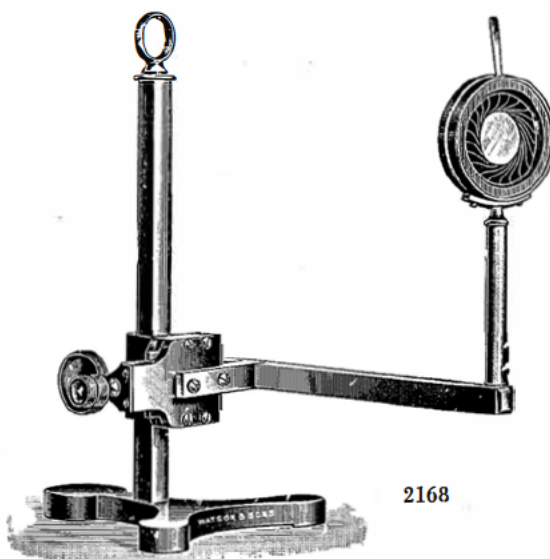
2165



2169



2167



2168

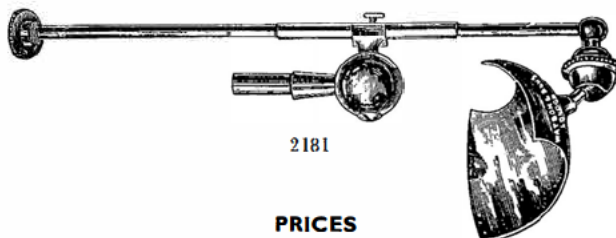
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313 HIGH HOLBORN, W.C.

STAGE CONDENSERS, ETC.

SILVER PARABOLIC SIDE REFLECTOR



2181

Code Word. No.
Payif 2181

PRICES

For the examination of Opaque Specimens, metallurgical etc., with objectives up to 1 in. (25 mm.) illumination exterior to the objective is advantageous. This reflector can be mounted to fit to the microscope stage in place of a stage spring, the microscope limb or between the objective and nosepiece end of the body. The light is concentrated upon the area to be examined and can be arranged to show in relief details lost when a vertical illuminator is employed. A ball and socket joint is fitted to all forms of mounting

£ s. d.

1 10 0

UNIVERSAL CONDENSER STAND

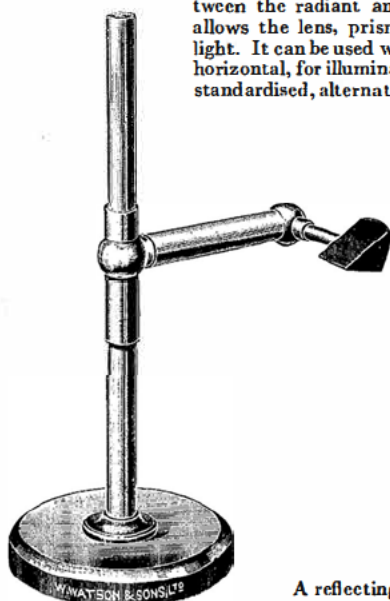
TO CARRY CONDENSERS, LENS-PRISM AND LIGHT FILTERS.

Pelem 2182

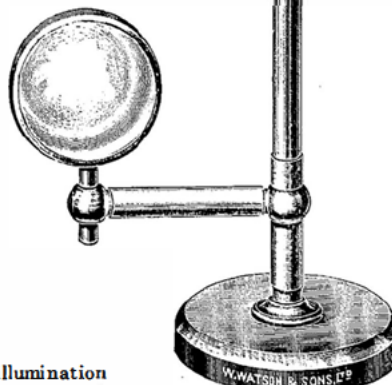
The usual form of condenser mounting necessitates its interposition between the radiant and mirror. The Universal condenser stand allows the lens, prism or filter only to project into the path of light. It can be used with microscopes at all angles from vertical to horizontal, for illuminating objects on the stage, etc. Further, being standardised, alternative fittings can be interchanged as required.

Stand only

£ s. d.
1 5 0



2183 and 2182



2182 and 21612

LENS-PRISM

A reflecting lens-prism for the illumination of opaque objects. The prism is mounted to fit the Universal Stand as shown.

Code Word. No.
Peamb 2183

Prism only

£ s. d.
0 15 0

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

VERTICAL ILLUMINATORS

By means of these, opaque objects adherent to the cover-glass, uncovered, in water or other media, provided the objective is immersed therein, may be examined with the highest powers. It is essential for the microscopical examination of metal surfaces, or any opaque material when truly axial light is required to yield an image free from diffraction and where the resolving power of the objective must be developed.

The Vertical Illuminator is attached to the lower end of the Microscope body and receives the objective. A concentrated beam of light is directed from the illuminant by means of a condenser, through an aperture in the side of the Illuminator, and falls upon a reflector inside. In one form this reflector consists of a disc of thin glass and in the other of a prism. By means of the reflector the light is thrown downwards through the objective to the specimen, thus illuminating it, the objective acting as its own condenser. The lamp condenser must be so arranged to provide a beam of light as from a light source 10 in. distant to yield the best results. The specimen is then viewed through the eyepiece and objective in the ordinary way. Some form of diaphragm, iris or disc, is advantageous to control the diameter of the entrant beam.

NOTE. Some workers are more successful with the prism Vertical Illuminator than with the cover-glass disc pattern, and vice versa. It will, however, be generally found that both kinds have their distinctive advantages. For a complete equipment, therefore, both are desirable.

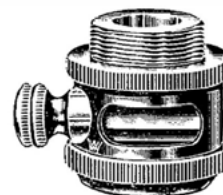
PRICES

For class work and general purposes.

Code Word.	No.		£	s.	d.
Perti	2191	Cover-glass Reflector, as figured	1	5	0
Perus	2192	Do., with metal diaphragm to aperture	1	6	6
Pesto	2193	Prism pattern, as figured	1	14	6
Petal	2194	Do., with Iris diaphragm	2	5	0



2191



2193

For Photomicrography with low powers.



2195

Code Word. No.

Petys 2195

This improved cover glass pattern was designed by Dr. Johnstone Ston-ey, to enable the large back lenses of certain objectives of wide aperture or long focus to be filled with light. The reflector is larger than in other patterns, and fills the largest back lens of objectives in general use. A large body tube is essential with this illuminator.

			£	s.	d.
		Without Iris diaphragm	2	0	0
Pewle	2196	With Iris diaphragm	2	10	6
Phalo	2197	The Iris diaphragm of No. 2196 may be mounted with eccentric adjustment at an extra cost of	0	10	0

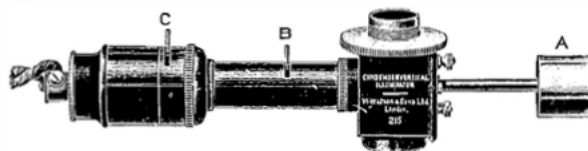
W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

THE WATSON-CONRADY CONDENSER VERTICAL ILLUMINATOR (Patent)

For the most exacting Research and for daily routine work.



Three outstanding disabilities have to be overcome by all users of Vertical illumination or illumination by reflected light: Glare accurate centration and focussing of the light source—need for complete rearrangement of the illuminating train if coarse or fine adjustments of the microscope are used.

These problems were satisfactorily solved for the first time by the introduction of the Watson-Conrad Vertical Illuminator which is not only the original of these vertical illuminator units but the best, and is in use throughout the world. It offers facilities to be found in combination in no other self-contained unit.

Incorporating the lamp, optical system, reflector and iris diaphragms it is possible:—

To bring the illumination under the same complete control which is obtained with transparent objects and the best substage apparatus and to obtain the maximum illumination from a small source of light.

To simplify and render certain the correct placing of the illuminant, whether it be supplied as a fixed portion of the illuminator or separate.

For general purposes a small 3.5 volt, 6 volt or 12 volt electric lamp may be fixed in a suitable position at the end of the condenser system, and when work is to be done, it is only necessary to switch on the current from the battery or main current supply (if a resistance is employed) and a satisfactory result is at once obtained. With this illumination can be obtained not only sufficient for visual but also for photographic purposes or can be used in conjunction with arc or other lamp if preferred. Metallurgical work to be done on an ordinary Microscope, for—when once attached to the body tube when the body is focussed, **the whole of the Vertical Illuminator and its Lamp is carried with it.**

The apparatus is used in the following manner:

The illuminator is attached to the nosepiece of the microscope, the objective is screwed into it and approximately focussed on the polished metal object. The light is switched on, and the illumination is then regulated by the inner Iris Diaphragm so as to cover the extent of the object actually under observation. This eliminates a large amount of stray light, and consequent gain in the contrast in the image is obtained. The Iris Diaphragm nearest the illuminant is then used in precisely the same manner as that of the ordinary substage condenser, and by its means the cone of illumination is adjusted to give the best effect.

If an independent illuminant is used, it should be set about $1\frac{1}{2}$ inches from the outer end of the tube. Any small source of light can be used, such as the edge of an oil lamp flame or small incandescent lamp, or if a very brilliant illumination is required for projection, etc., a small arc lamp should be used, such as our "Argus" model, or a ribbon filament lamp suitably mounted.

W. WATSON & SONS, LTD.

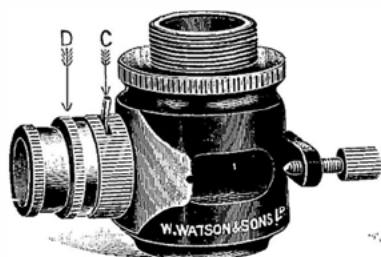


313 HIGH HOLBORN, W.C.

THE WATSON-CONRADY CONDENSER VERTICAL ILLUMINATOR—Continued

Code Word.	No.	PRICES	£	s.	d.
Perme	2211	Condenser Vertical Illuminator with disc reflector and adjustment without Lamp	6	0	0
Perni	2212	Do. do. with 3.5 Volt Lamp fixed to Condenser tube with one yard silk-covered wire	6	5	0
Pcrys	2213	4 Volt Accumulator for 3.5 Volt Lamp, with switch, in case Resistances for use when main house current is employed	1	5	0
Merge	2214	... .. 100-125 volts	1	7	6
Mergi	2215	... .. 200-250 volts	1	17	6

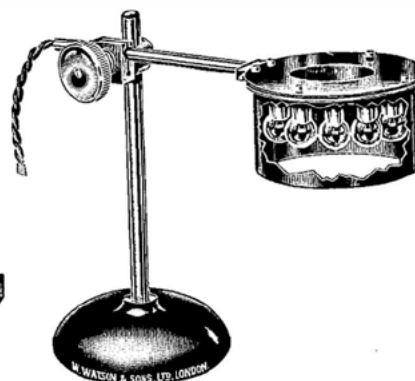
COMBINED VERTICAL ILLUMINATOR



2216



2217



Code Word. No.

PRICE, Complete

£ s. d.

Phamo 2216

Metallurgists usually find in their microscopical work that for some purposes they need a Prism reflector, and for other purposes a Disc reflector pattern is better. To obviate the necessity of having two separate pieces of apparatus we have devised a holder into which the Prism Carrier "A" or the Glass Reflector "B" can be set, as required. When in position, rotation within necessary limits can be effected, and adjustments for centrality can be made by means of a screw acting on a wedge. Mounted on the side of the apparatus is an Iris Diaphragm "C," and a small Condenser lens "D." Either of these can be removed when desired. This combination arrangement will be found highly convenient, saving time, expense and superfluous fittings ...

3 10 0

SUBSTAGE MACROGRAPH

Malba 2217

Designed originally by Prof. Tulloch as a part of the microscope substage for typing bacterial colonies by means of the surface reflections, it has been mounted to permit its universal use for the illumination of specimens on the stage or at table level.

The small electric bulbs ensure shadowless illumination of the specimen and sufficient brilliancy for photography with either low power microscope objectives and eyepieces or photo micrographic lenses.

This accessory fills the long acknowledged need for a method of bridging the gap between the vertical and other illuminations and prism top lighting systems for photography.

If used in combination with a Greenough or Substage lamp much valuable detail, both internal and external, can be successfully and easily recorded

3 10 0

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

RHEINBERG'S COLOUR DISCS

For optically differentiating in colour, structures, organisms, etc. Can be employed with Objectives having apertures up to 0.45. Designed expressly for use with the Abbe illuminator. Unstained objects can be shown in colour contrast with the background.

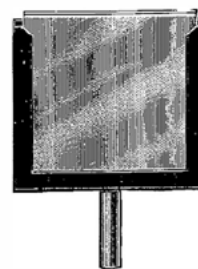
Code Word.	No.		£	s.	d.
Pitye	2222	Set of coloured Gelatine Discs, to fit the Stop Carrier of Abbe Illuminator per dozen pairs	0	2	6

STAND FOR LIGHT-FILTERS

The holder carries 2 filters 2 x 2 in., and fits on the socket of the arm on the Universal Condenser Stand. Adjustable for any height and inclination in the path of light rays.

Code Word.	No.		£	s.	d.
Phusi	2223	Holder as described, to fit Universal Stand	1	0	0
Pelem	2224	Universal Stand to carry light-filters, Amici prism, condenser, etc.	1	5	0

See p. 218.



WRATTEN "M" FILTERS

Pelum	2227	For Photomicrography and Visual Work. Special booklet dealing with the use of these filters in Photomicrography	£	s.	d.
			0	5	0

STAINLESS STEEL MIRRORS for MICROSCOPES

The necessity for a Mirror giving one reflection only of the lamp flame has long been recognised, and in special cases parallel worked mirrors have been supplied, as well as, in some cases, mirrors with surface silvering. These, however, have had obvious disadvantages. Stainless Steel is well known in connection with cutlery; it is non-corrosive, takes a very high polish and can be worked perfectly plane.

After extended experiments, we have produced Stainless Steel Mirrors with a perfectly flat surface and suited in every way for microscopical work.

Code Word.	No.		£	s.	d.
Pound	2225	Made in one size only, 50 mm. diameter (about 2 inches)	0	15	0

PRISM REFLECTOR

An important difficulty connected with the stainless steel mirror is that of % reflection. There is a maximum reflective power after 3-4 months use of about 60% and this remains reasonably constant for considerable periods.

Where the maximum brilliance is essential a 45° Prism will be found the ideal solution. Not only is there a single reflection but little light is lost by absorption and if correctly mounted upon the mirror stand the beam must be transmitted along the optic axis of the instrument.

Code Word.	No.		£	s.	d.
Pouvu	2226	2" square face 45° prism unmounted	2	10	0

Cost of mounting depends upon work necessary and will be quoted separately.

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

LIGHT-FILTERS

Among the advantages obtained by the use of light-filters in photomicrography may be mentioned the following : Contrast, adaptation to plate-sensitivity, resolving power, maximum distinctness with non-apochromatic objectives.

Light-filters may consist of coloured glass plates, coloured liquids in glass troughs, coloured gelatine films, or any of these in combination. When consisting of coloured glass or of coloured gelatine film (mounted or plain) they are usually in squares 2 x 2 in., or in circles to fit the substage mount.

CHANCE-WATSON LIGHT-FILTERS

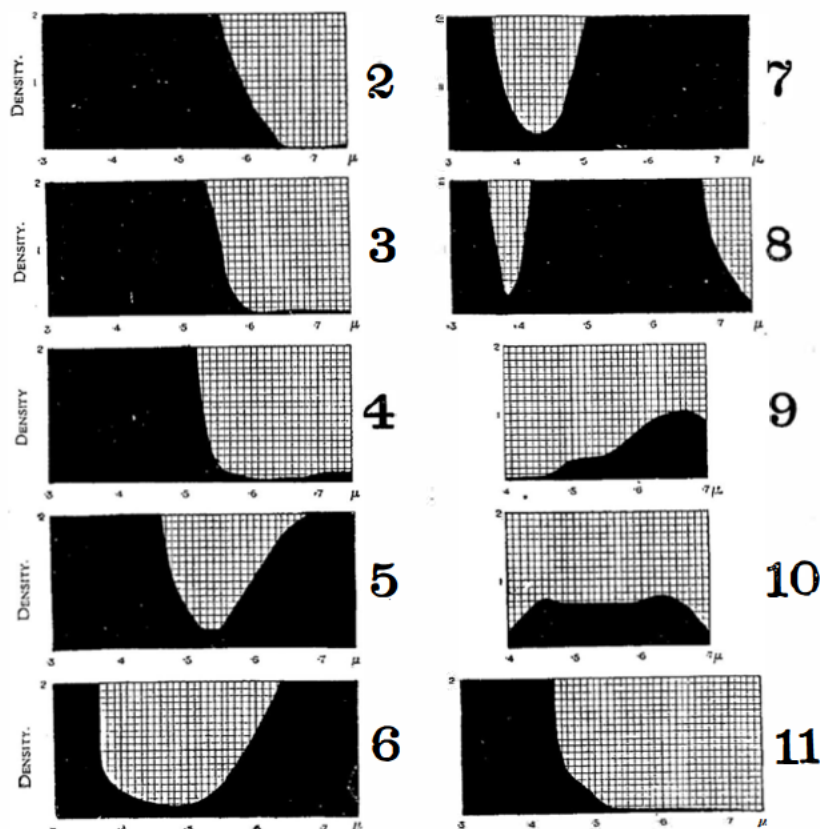
The use of coloured glass light-filters is essential for those who use radiants or high intensity. They are utilised to diminish brilliancy, reduce heat, accentuate structure of stained specimens. Coloured glasses are also more permanent in tint than stained gelatine. The present series of light filters has been carefully selected for colour by spectrophotometric methods. The glass is coloured evenly throughout, and is known as "pot metal" to distinguish it from the so-called "flashed" glass. This excellent series of coloured glasses has been made by the eminent and old-established firm of Chance Brothers & Co. Ltd. The selected material is cut, polished and edged in our own works.

The Chance-Watson glass light-filters are as follows :—

2 Red	6 Blue-green	9 Daylight
3 Deep orange	7 Blue	10 Neutral
4 Orange	8 Purple	11 Yellow
5 Green		

In ordering, the colour should be mentioned as well as the number.

Special quotations will be submitted for any selected transmission in the foregoing colours, also for any size of plate.



N.B. The orange filter will be found exceptionally successful in photography on misty subjects, and does not affect the performance of any well-corrected photographic lens.

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The diagrams represent the absorption of light of different wavelengths by each of the light-filters in terms of density for a thickness of 2 mm.

Density = log. opacity — log. transparency ; thus density 2 represents a transparency of 1 per cent.

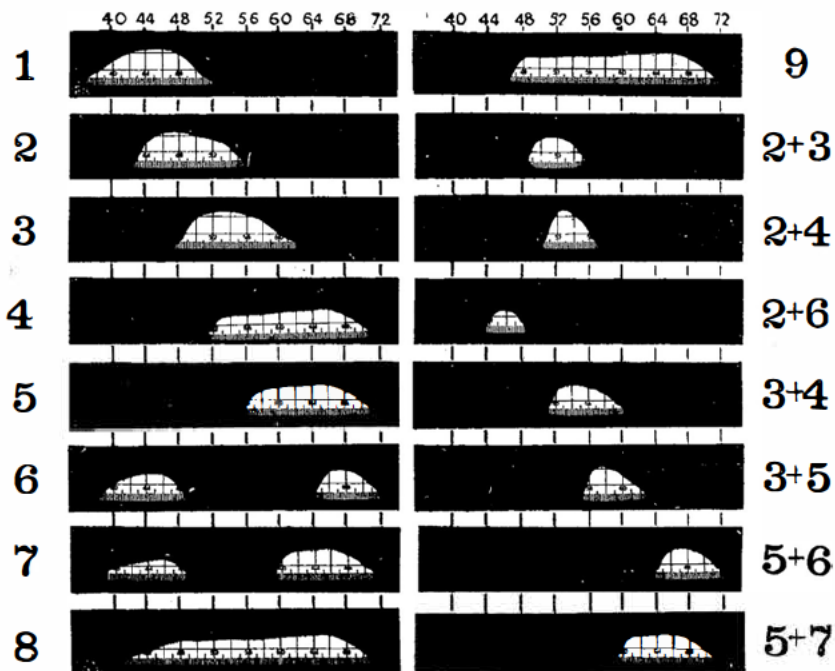
Code Word.	No.	PRICE	£	s.	d.
Batail	2241	Special stand to hold one or two 2-in. square filters	2	10	0
Shako	2242	Chance-Watson light-filter, in circles of 1½ in. dia., to fit substage ring	0	2	6
Shall	2243	Ditto optically worked	0	4	6
Shaft	2244	In squares, 2 x 2 in.	0	3	0
Shagi	2245	Ditto, optically worked	0	5	0
Shame	2246	In squares, 4 x 4 in.	0	10	0
Shalt	2247	Ditto, optically worked	0	15	0

ILFORD "MICRO" LIGHT-FILTERS

A set of nine light-filters made by the Ilford Company offers advantages in adaptability. Beside the use of each light-filter singly, seven useful combinations may be made to obtain a wide or narrow band in any desired region of the spectrum. The light-filters are of coloured gelatine sealed between polished plates of glass. These light-filters are numbered 1 to 9. No. 8 is the "Alpha," which is generally useful for the correction of Ilford panchromatic plates.

Ilford light-filters for photomicrography are supplied as 2 x 2 in. squares, or in circular form to fit the swing-out rings of substage condensers.

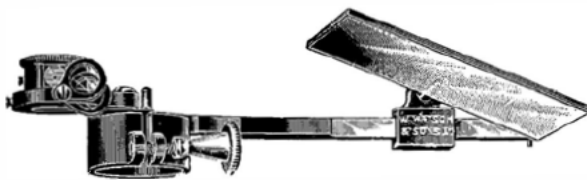
Code Word.	No.	PRICE	£	s.	d.
Beper	2248	Ilford "Micro" light-filters, square, 2 x 2 in.	0	5	6
Bepit	2249	Set of nine	2	4	7
Bepos	22410	Ilford "Micro" light-filters, 1½ in. circles, for condenser-ring	0	3	0
Bepuz	22411	Set of nine	1	4	4
		For the utilisation of one only, the lines in the spectrum of the mercury-vapour lamp :—			
Berba	22412	Square, 2 x 2 in., transmitting only Hg. green line	0	5	6
Beree	22413	Ditto, for Hg. blue	0	5	6
Berek	22414	Ditto, for Hg. violet	0	5	6



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Beale's. No. 2252

Success in using this apparatus depends upon the relative brightness of microscope image and drawing paper. This is best adjusted by subduing the illuminating rays by means of neutral-tinted glasses and not by shades on the camera lucida.

BEALE'S[illegible]

2254

Pavel	2253	This is a combined Eyepiece and Camera Lucida, for use when the Microscope is inclined at an angle of 45°. The drawing paper and pencil point are reflected into the field by the prism attached to the Eye Lens, and tracings can be made with great precision, comfort and rapidity. With tinted glasses to regulate light, complete The Eyepiece with the above Camera Lucida fits the Student's size. If required of larger size, an adapter is supplied at an extra cost of	2 0 0 0 7 0
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DRAWING TABLE					
Pawns	2254	Inclines to any angle, thus obviating distortion of image. Size of table, 19 x 12 inches, as figured, and of best make	1	5	0
Pazuc	2256	Dr. Calman's pattern, of fixed height with inclining top, very rigid	1	0	0

The most accurate method of drawing a microscopic object is to project its image upon paper and to trace its outlines direct. This is done by placing the microscope with its axis horizontal and attaching the Watson Projecting Drawing Prism over the eyepiece. The image is reflected downwards to a sheet of paper on the bench. A fairly intense illuminant is advantageous and the image should be shielded from other lights. This method can also be used for projection over short distances in teaching.

[illegible]

313 HIGH HOLBORN, W.C.

LIFE CELLS, ETC.

REVERSIBLE COMPRESSOR



Code Word, No.
Pivot 2261

PRICE

£ s. d.

The two parallel plates are separated mechanically by means of a screw pushing in a block, thus accommodating the pressure for any thickness of object. The plates on each side are cover glasses, easily replaced when broken. With this form the specimen may be examined from either side. Made of aluminium throughout. With covers 2 2 0

ROUSSELET'S COMPRESSOR



B 3536

Plaid 2262

The compression is by means of a screw in the drum, and the cover glass having a square top, media may be introduced during examination of specimens. The objective may be used at any point where compression takes place. The arm carrying the cover glass can be turned completely aside for cleaning or replacing covers, and is held centrally by a spring catch. We have introduced a special improvement with two screws, instead of cement to hold the cover glass

0 17 6

The central glass tablet is sufficiently thin to allow its use in combination with any substage condenser having a working distance of 1 mm.

ROUSSELET'S LIVE BOX

2263



Plano 2263

Rousselet's Live Box for use with Oil immersion dark ground Condenser, Paraboloid, etc.

0 17 6

The advantages of this are: It can be used with the Substage Condenser, Spot Lens, etc. 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. For the examination of living ciliated organisms by dark ground or transmitted light illumination this apparatus will be found superior to anything else obtainable, while the sleeve carrying the cover glass has sufficient margin between the edge of the lower tablet and the rim of the cell to use a $\frac{1}{2}$ " Objective to the edge.

Satob 2264

Extra covers for Live Boxes, sold in dozens only, per doz.

0 2 6

W. WATSON & SONS, LTD.



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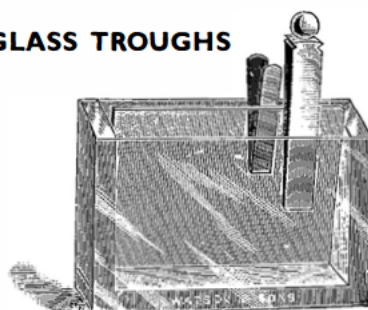
LIVE BOXES AND TROUGHS

LIVE BOXES



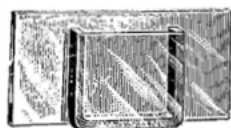
2271

GLASS TROUGHS

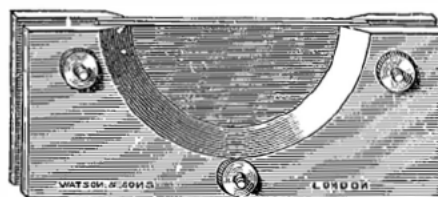


Code	Ward.	No.	PRICES	2274	£	s.	d.
Plate	2271	Live Box, large size, best quality	...	...	1	0	0
Pligo	2272	Ditto small size	...	...	0	6	6
Plode	2273	Troughs for Animalcules; various widths mounted upon slides, 3 x 1, 1/6 and 3 x 1 1/2	...	...	0	2	6
Pluce	2274	Zoophyte Trough, with plate, wedge and spring	...	...	0	6	6
Plumo	2275	Watch Glasses, flat bottom, per dozen	...	...	0	4	6

BOTTERILL'S TROUGH



2273



2276

Plyat	2276	This has two plates of vulcanite, held together by three screws, between which are placed two slips of glass separated by an ordinary indiarubber ring. The glass can be readily taken apart and cleaned, and in the event of being broken can at once be replaced	0	5	0
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SIMPLE TYPE MOIST CHAMBERS



Shave	2277	Glass Slip 3 x 1 in., with glass plate cemented on, aperture 10-18 mm., as specified	0	4	6
Shawl	2278	Glass Slip 3 x 1 in., with cemented glass ring 20 mm. diameter, and having 2 glass tubes to conduct gases or liquids to the object	...	...	0	10	0

EISENBERG CAVITY SLIDE

For tissue culture, living bacteria observations, etc., see page 31

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

GLASS TROUGHS

"Vitrified" Type

Acid Proof Cement

FOR COLOUR FILTER MEDIA, COOLING TROUGHS, SPECTROSCOPIC PURPOSES,
CHEMICAL REAGENTS, POND LIFE, ETC.

Workers constantly experience difficulty owing to the fact that, with the exception of the Kingsford type of trough, few cemented troughs remain water tight for long, and none remain water-tight under all conditions. These new vitrified troughs remain water-tight and whether subjected to the action of heat, powerful acids or any other dissolving agent, these troughs remain intact. This is effected by employing a fusible glass cement and the sides are cemented in the furnace. The plates of glass forming the sides are optically polished, thus the troughs can be used for storing and examining animalculæ, pond life, etc. As light filters they are unequalled as the sides are parallel, so there is no inequality in the quantity of light filtering medium, and owing to the polished sides no seeds or other impurities interfere with the beam from the light source.

The method of manufacture causes these troughs to be more expensive than the ordinary cemented type, but if the length of their life is considered they are very cheap.

Three sizes are kept permanently in stock, and can be supplied in quantities.

Code Word.	No.							£	s.	d.
Shank	2281	Outside measurements, 4	× 4 × 1 inch	...	...	...	...	1	7	6
Shape	2282	"	" 3 $\frac{1}{4}$ × 3 × 1	"	...	...	...	0	17	6
Shard	2283	"	" 2 $\frac{1}{2}$ × 2 × $\frac{1}{2}$	"	...	...	...	0	12	6

All sizes and types can be made and supplied to order. Send particulars of requirements and a quotation will be forwarded.

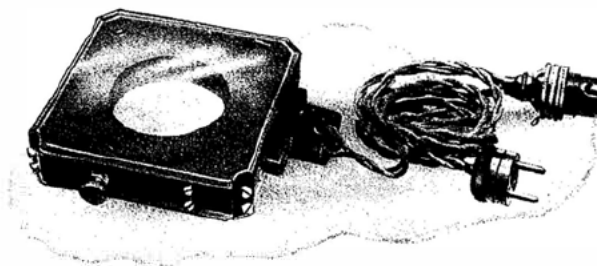
HEATING STAGES. Self-regulating Type

Designed by Dr. MACLAREN, Anatomy Department, Glasgow University.

This heating stage is the most effective of all designs and can be used directly from mains current without the interposition of a resistance. A filament lamp is mounted in circuit, this serves as an indicator of where the current is switched on, no fluid is needed.

Designed for temperatures up to 50° C. It is electrically controlled and automatically maintains the temperature constant to within 0.1 degree.

It is simple and clean to handle, and can be used directly with voltages of 110 v. or 220 v.



Code Word.	No.								£	s.	d.
Share	2284	Price ...	...	...	...	...	...	...	6	10	0

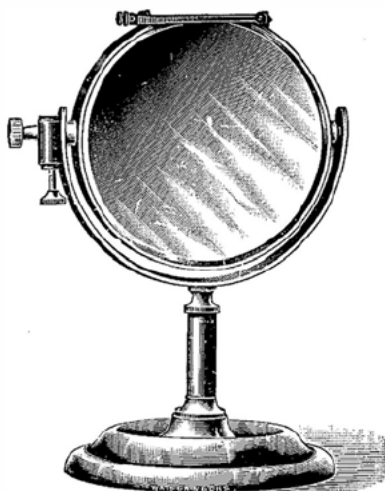
Full instructions for use accompany each stage.

W. WATSON & SONS, LTD.

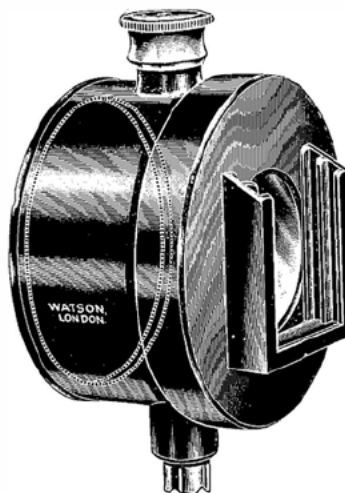


313 HIGH HOLBORN, W.C.

GLASS TROUGHS



2291



2294

This trough is designed especially for watching the development of Pond Life, and for use as a small Aquarium. It is exceptionally advantageous for light filter media. The construction is very simple, consisting essentially of an outer circle of brass, drawn together at the top by means of a screw or screws. The brass circle is lined with indiarubber, and with blocks of indiarubber so placed as to keep the glass faces, which are circular, in position. These glass discs are gripped by the indiarubber when the tension on the outer metal band is increased by the tightening of the screws. It is absolutely water-tight.

The distinct advantages over all other troughs are that :—

By merely releasing the screws, all parts can be taken to pieces and cleaned.

Any broken part can be at once replaced.

Code Word.	No.		£	s.	d.
Poems	2292	Large Table Trough, as figured, with 6 in. solid metal base. Internal diameter of Trough, 7 $\frac{3}{8}$ in. mounted in gymbals, with clamp to fix at any desired angle, complete	3	3	0

PHOTOMICROGRAPHY AND PROJECTION

Poets	2293	This trough has been designed for mounting upon any saddle of existing photomicrographic or projection apparatus. Made solidly, no risk of breakage arises, the aperture facing the condenser (microscope) is of smaller diameter than the face and no deposit need be feared. In addition a carrier for two filters 2" x 2" is incorporated. The whole is exceedingly compact and efficient. Size 3 $\frac{3}{4}$ " dia. State diameter of saddle sleeve when ordering.			
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		Price for trough with colourfilter holder	3	10	0
Beema	2294	Extra for solid table stand	0	15	0
Beelo	2295	„ saddle 45° type	...	...	...	1	5	0

PHOTOMICROGRAPHS

Photomicrographs of macro and microscopic specimens are taken by a photomicrographer of exceptional skill for illustrations, demonstrations, lantern slides, etc.

Code Word.	No.		£	s.	d.
Stave	2296	Magnifications under 500 diameters with one negative and one print	0	10	6
Stead	2297	Ditto. over ditto	0	15	0

W. WATSON & SONS, LTD.

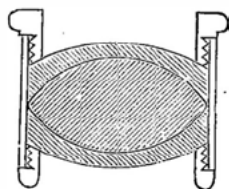


313 HIGH HOLBORN, W.C.

MAGNIFIERS—APLANATIC

(also known as Platyscopic Lenses.)

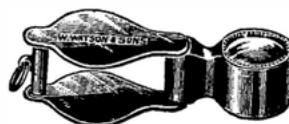
Flat field, bright and
exquisitely
crisp image.



2301



2301-4



2305-8

Optically these magnifiers consist of three lenses cemented together, as shown in Fig. 2300. They give a large and very flat field, exquisite definition, and good working distance. They all have large apertures, and yield very brilliant images. They are unexcelled both for dissecting purposes and as pocket lenses, and are strongly recommended.

The dissecting magnifier mounts are all standard size and can be used on any dissecting microscope by other makers.

Magnifying Power	No. 2301 × 6	No. 2302 × 10	No. 2303 × 15	No. 2304 × 20
Diameter of Visual Field	1.4 in.	.8 in.	.4 in.	.25 in.
Focal distance from lower surface of Lens to Object	1.5 in.	.9 in.	.6 in.	.45 in.

Three patterns of mounting are supplied for these Magnifiers :

1. Similar to 2301-4, to fit any of the Dissecting Microscopes and Lens Stands quoted on pages 201 to 203
2. Similar to 2305, in nickelled metal or shell mounting for the pocket.
3. A Combination pocket mount, similar to 2305, to receive either of the Dissecting Mounts, pattern 2301-4, so that the same magnifier may be used either for dissecting or the pocket.

Code Word.	No.	Magnifying Power.	In Dissecting Mounts. £ s. d.	No.	In Nickelled Metal Pocket Mount. £ s. d.	No.	In Combination Mount as described above. £ s. d.
Poize	2301	6 diameters	0 15 0	2305	1 0 0	2309	1 5 0
Point	2302	10 "	0 15 0	2306	1 0 0	23010	1 5 0
Poise	2303	15 "	0 15 0	2307	1 0 0	23011	1 5 0
Poila	2304	20 "	0 15 0	2308	1 0 0	23012	1 5 0

We are frequently asked to supply pocket mountings with 2 or 3 magnifications.

Any combination of 2 magnifications permanently mounted, ... £1 12 6

Chromium plated or nickelled mounts at choice.

SPECIAL DOUBLET MAGNIFIER

This Magnifier is composed of two Lenses only, but gives very good results. As a useful and cheap Dissecting or Pocket Lens it is much appreciated. Magnification, 8 diameters.

Code Word.	No.	In Dissecting Mount, as figured ...	£ s. d.
Pokel	23013	...	0 8 0

The Magnifier fits the Dissecting Microscopes and the Dissecting Lens Stands, pages 201 to 203,



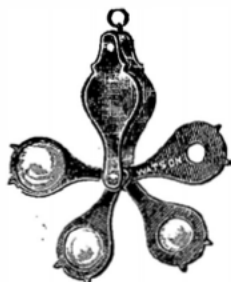
23013

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

POCKET MAGNIFIERS



2311



2317



2318

Code Word.	No.		£	s.	d.
Polar	2311	Pocket Magnifier, in folding tortoise-shell mount, of very best quality, three lenses with diaphragm, as figured	0	12	6
Polem	2312	Ditto, ditto, 2 lenses, 10/0 Ditto 1 lens	0	7	6
Polka	2313	Ditto, ditto, in horn or vulcanite, 1 lens	0	1	6
Pooli	*2314	Ditto, ditto, " " 2 lenses	0	2	3
Popae	*2315	Ditto, ditto, " " 3 " "	0	3	6
Posty	2316	Stand to hold either of the preceding, for dissecting	0	5	0
Potch	2317	Watchmakers' Eye-Glass, as figured	0	1	9
Pouri	2318	Pocket Magnifiers, with Horn Cases, in 3 sizes, as figured			

27 mm. 2/-, 36 mm. 3/3 40 mm. 0 5 0

* Nos. 2314 and 2315 are adopted by many Technical Schools, Botanical Classes, etc., and are eminently suitable for the purpose. They are mounted as 2311.

WATSON'S INDUSTRIAL MAGNIFIER

Obviates the strain associated with the use of Watchmakers' Eyeglasses, permits the use of both eyes. Ideal for watch, electric meter, telephone assembly, etc.

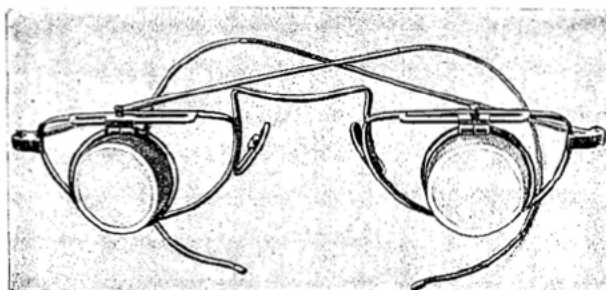
Consists of two rectangular magnifier lenses 6" x 4". Larger sizes available. Prices on application.

Code Word.	No.		£	s.	d.
Marbe	2319	Pair of lenses only	3	0	0

Usually supplied in plain wooden frame, can be mounted to suit any desired purpose. Cost of mounting quoted on application. **Special quotations for quantities.**

WATSON'S "SPEERA" BINOCULAR MAGNIFIER

MOUNTED IN ADJUSTABLE SPECTACLE FRAMES.



"Speera" Binocular Magnifiers, mounted as spectacles, have been found exceptionally valuable in numerous and unexpected ways, because when in use, both hands are free to manipulate the object. The range of usefulness is wide, embracing all work that is of a minute or delicate character, such as the examination and dissection of natural history subjects, operations on structures such as the eye, fine machine work, watch repairing, etching, engraving, cinema film examinations, etc.

They are more convenient and comfortable than other magnifiers because :—

1. The lenses are achromatic, and give a sharp flat field.
2. They give a stereoscopic effect.
3. They can be fitted to the face with accuracy and facility.
4. The skeleton nature of the frame enables the wearer to locate ordinary objects without removing the magnifiers.
5. No fatigue in use as prisms to aid convergence are incorporated.

"Speera" Binocular Magnifiers are made in three powers, the focal lengths being 5 in., 7 in., and 10 in., giving magnifications of 3.5, 2.5, and 1.75 diameters, respectively.

Code Word.	No.		£	s.	d.
Speea	23110	Price complete in case, with instructions for use	2	0	0

W. WATSON & SONS, LTD.



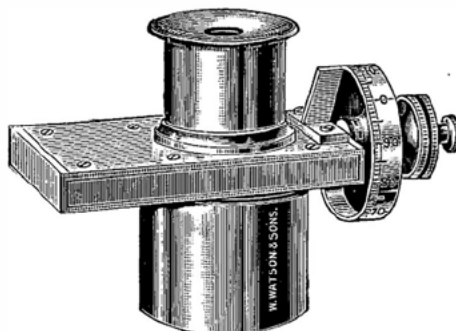
313 HIGH HOLBORN, W.C.

SCREW-MICROMETER EYEPIECE

Code Word. No.

Pounc 2321 This is constructed almost entirely of aluminium, and is very light in weight. The teeth are cut to 1 mm., and the drum indicates the 1/100 part of each tooth. The reading can therefore be taken to 1/100 part of a millimetre. The fixed web is set a little to the side of the field, as recommended by Dr. Dallinger. Of best and most accurate construction. With Huygenian Eyepiece ... £7 15 0

Powdy 2322 Screw-Micrometer Eyepiece, similar design to above, but in brass. The eyelens has sliding focussing adjustments and it is of the utmost precision throughout. It is made for Eyepiece fittings of the Universal size ... £5 10 0



Screw-Micrometer Eyepiece,
2321

STUDENTS' MICROMETER EYEPIECE



Code Word. No.
Power 2323

Micrometer Eyepiece, for use with Micrometer No. 2324 or 2325, Eyelens mounted on telescopic sliding tubes for focussing micrometer.

Without micrometer ... 0 15 0

£ s. d.



Eyepiece Micrometer,
2324

EYEPIECE MICROMETERS

Code Word. No.

Prace 2324 Ruled with scale, as figured, 1 cm. in 100 parts ... 0 10 0

Pragm 2325 Ditto, ditto, in Squares, 1 cm. in 100 parts ... 0 10 0

Prais 2326 Ditto, ditto, the same as No. 2324 or 2325 but mounted to fit large-sized capped Eyepiece (Eyepiece not included) ... 0 12 6

Shear 2327 "Step" Eyepiece Micrometer, the simplest and most accurate form of eyepiece micrometer, as illustrated, to fit any eyepiece ... 0 15 0

Sheax 2328 Cross line disc suitable for Petrology, in place of spider lines diamond ruled on glass, to fit Eyepiece ... 0 7 6

NOTE.—The values of the lines of the Eyepiece Micrometer are ascertained by means of the Stage Micrometer and vary with every objective and tube-length. It is not therefore important what the divisions represent, so long as they are equi-distant.



Eyepiece Micrometer
in squares, 2325



Step Micrometer
2327

STAGE MICROMETERS

Code Word. No.

Prank 2329 On 3 x 1 slips, Ruled to 1/10 and 1/100 mm. ... 0 12 6

Prate 23210 On Ditto, ditto, 1/100 and 1/1000 inch ... 0 12 6

Shelf 23211 Maltwood Finder. The simplest method of recording special positions on specimens retained for further reference ... 0 6 0

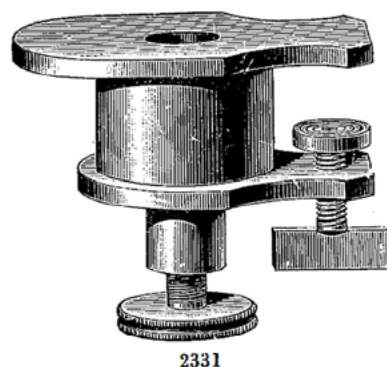
Shelo 23212 Cross lines ruled at centre of 3 x 1 slide for centering rotating or mechanical stages, etc. ... 0 5 0

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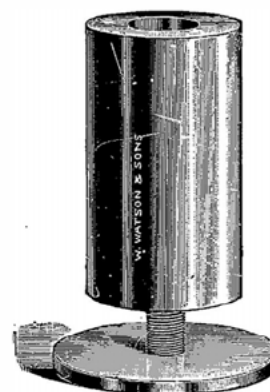
MICROTOMES



2331



2334



2335

PRICES

Code Word.	No.		£	s.	d.
Prawn	2331	Mr. Cole's Pattern Section Cutter, as figured. This is a most useful and efficient Section-Cutter, being very solid and rigid in use. The screw for raising the sections is very fine, and the milled head extra large, enabling very thin sections to be cut	2	12	6
Preac	2332	Set of Punches, complete in case, for cutting out embedding substances, extra	0	10	0
Pream	2333	Mr. Cole's Pattern Section Knife, in case	0	8	6
Prebo	2334	Hand Section Cutter, for Botanical work	0	9	6
Preca	2335	Darlaston's Hand Section Cutter, as Fig. 2335. Of simple construction, but of especially solid make, enabling considerable accuracy to be obtained. It is of solid brass, 1½ inch diameter, and has a well ⅝ inch diameter. The raising screw—which is purposely fitted loosely to facilitate exact adjustment has 35 threads to the inch	0	14	6

MICROTOME ACCESSORIES

Sunny	2336	Metal Moulds, L shaped for casting, Paraffin blocks	per pair	0	4	0
Super	2337	Elder Pith, for Embedding	per bundle	0	0	9
Suppo	2338	Paraffin Wax, Hard or Soft	per lb.	0	1	8
Suppl	2339	Strong Razor of good quality		0	2	9
Suppi	23310	Cole's Pattern Section Knife, with fixed steel handle		0	8	6
Surna	23311	Plane Iron with handle for Cathcart Microtome		0	8	6
		Embedding Baths, Hot plates, etc. for electric, gas or oil supplied at makers list prices.				
Predn	23312	Celloidin Solution, thick	25 grms.	0	3	0
Pregy	23313	" " thin	25 grms.	0	2	0

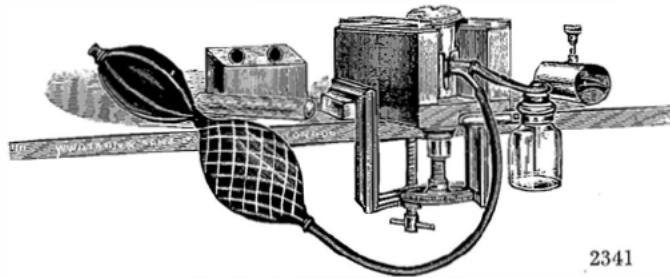
W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

MICROTOMES—Continued

THE CATHCART



2341

Specially Recommended for Schools

THE CATHCART MICROTOME

This popular form of microtome is fitted for Ether Freezing or Embedding. For freezing tissues it is arranged as shown above; to embed tissues the tubes, bottle and the freezing tube are drawn out, the latter being replaced by another tube, with clamp. The substance to be cut (embedded in paraffin or other medium) is then inserted, and the clamp screwed up. This instrument is thoroughly well finished, and the adjusting screw milled head is made specially large to permit a fine movement.

Code Word.	No.	PRICES	£	s.	d.
Prayl	2341	Microtome as above, with double clamp to fasten it to table, spray bellows and freezing apparatus, tubes for making paraffin blocks, etc., complete	2	0	0
Prels	2342	The above Instrument, arranged for Ether Freezing only	1	11	6
Prema	2343	Ditto, ditto, for Embedding only	1	10	0
Prepo	2344	Plane Iron Section Knife, in handle	0	8	6
Prest	2345	Ether Points, extra sets	0	4	6
Pride	2346	Rubber Spray Bellows	0	5	0

W. WATSON & SONS' KNIFE CARRIAGE PATTERN

CATHCART MICROTOME

This is a similar instrument to No. 2341, but the razor carrier runs on brass, and not glass, guides. This latter has an adjustment allowing the razor edge angle to be adapted to the work in hand. The milled head for raising the materials is also furnished with an indicator by which the thickness of section can be accurately gauged.



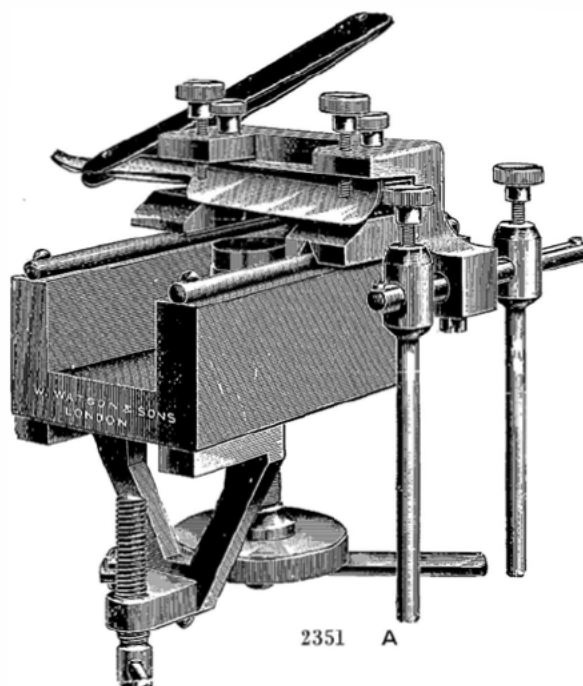
2347

Code Word.	No.	PRICES	£	s.	d.
Prim	2347	For Freezing and Embedding with one razor	3	5	0
Prism	2348	For Freezing only	2	15	0
Priva	2349	For Embedding only	2	17	6

W. WATSON & SONS, LTD.

313 HIGH HOLBORN, W.C.

MICROTOMES—Continued



THE CATHCART-DARLASTON (Registered)

Realising the demand for a low-priced microtome, which, while preserving the simplicity and excellence of the Cathcart pattern, would yet enable the worker to cut sections of a definite thickness, we carried out a suggestion made by Mr. Darlaston, and produced an elaboration of the ordinary Cathcart microtome which will, we believe, be much appreciated by careful workers. The illustration shows the general principle, which is briefly as follows: The forks A are attached to the knife carriage, and in drawing the latter back one of the forks engages with a lever attached to the milled head, and thus raises the material a distance of from $1/250$ to $1/5000$ of an inch, according to the position in which the forks are placed; thumb screws permit the distance between the two being varied at will. The forward traverse of the carriage causes the second fork to engage, which replaces the lever in its original position ready for the return thrust. The entire system is automatic, and work as accurate as that of a complicated and expensive instrument is possible. The automatic motion may be dispensed with at pleasure, and the milled head rotated by the hand as usual.

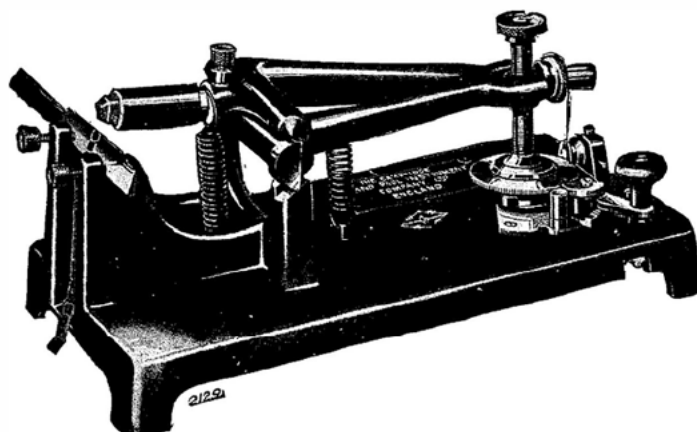
Code Word.	No.		PRICES						£	s.	d.
Priby	2351	Complete, for Freezing and Embedding	...	...	...	...	...	...	4	7	6
Prize	2352	For Embedding only	3	17	6
Probe	2353	For Freezing only	4	2	6
Proct	2354	Razor for above	0	2	9

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THE CAMBRIDGE ROCKING MICROTOME



The Cambridge Rocking Microtome is most popular of all on account of its striking simplicity of construction and efficiency in action. Its accuracy and reliability in working are due to the geometrical design, which avoids the use of slides and bearings which might wear or become loose.

The action of the Cambridge Rocking Microtome may be described as follows : The material to be sectioned is carried downwards across the knife, which is held with its edge upwards, by means of a rocking movement. The rocking arm to which the material is clamped turns on knife-edge bearings, thus ensuring an exact and smooth movement. The advance of the material towards the knife is effected by the movement of another rocking arm carrying the bearings already mentioned.

The handle which actuates the rapid movement of the material also acts by means of ratchet and pawl on a screw movement controlling the slow advance towards the knife. The actual advance of the specimen for each section is controlled by a stop which can be set for any desired section-thickness by means of a scale having 12 divisions, each division being equivalent to a thickness of 2μ .

The object holder will carry either the usual paraffin block or the wood block. An orientating object holder is also supplied, to enable the object to be cut in any desired direction.

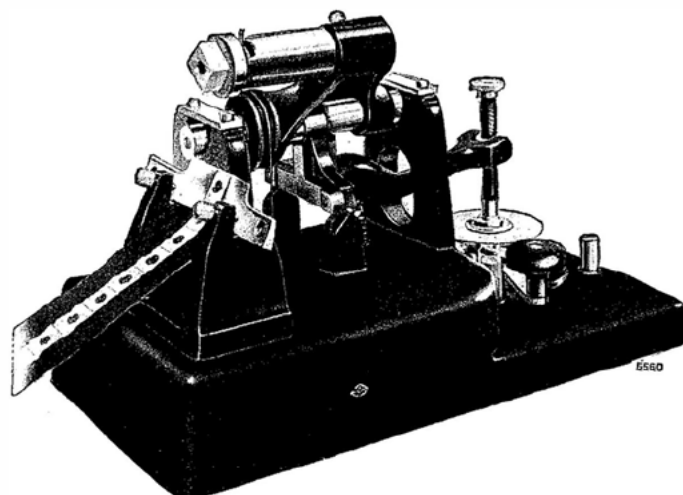
Code Word.	No.		£	s.	d.
Soabe	2361	Cambridge Rocking Microtome , complete with simple object holder, orientating object holder, simple pattern, and knife ...	6	18	0
Soach	2362	Simple object holder... ..	0	2	6
Soadl	2363	Object holder for wood blocks	0	15	0
Soafn	2364	Hard wood blocks, 22 mm. square... .. per doz.	0	2	0
Soagu	2365	Ditto, 16 x 22 mm.	0	2	0
Soaki	2366	Orientating object holder, simple pattern... ..	0	7	0
Somas	2367	Knife	0	3	6

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

CAMBRIDGE FLAT CUTTING MICROTOME



The instrument illustrated has been designed for cutting perfectly flat sections from specimens embedded in paraffin wax or when the dry celloidin method of mounting is employed. It is capable of cutting sections 3 cm. square, and the thickness of the cut can be varied from 0 to 20 microns. The instrument can be used for ribboning with certainty and ease. Any possible wear of the essential mechanism is automatically compensated and the instrument will, therefore, remain in perfect adjustment over long periods. Extreme rigidity characterises the entire design.

The mechanism is similar to that of the well-known rocker microtome in which the embedded object is fed forward automatically by rotation of a micrometer screw which is effected by the action of a pawl upon a milled disc rigidly fixed to the base of the screw. The pawl is operated by a reciprocating handle. In this new microtome rotation of the micrometer screw raises one end of a horizontal arm pivoted on knife edges, which in turn feeds the specimen forward by an amount proportional to the rotation of the screw, and may be varied by adjusting the amount during which the pawl is in contact with the milled disc by moving an index pointer over a scale divided in microns. The entire system is free from back-lash and the knife holder is of very rigid design. Two types of knife are made, one being hollow ground and the other having almost straight sides. Both are supplied with removable backs for sharpening, giving a cutting angle of 17 degrees for one knife and 21 degrees for the other knife. Special backs can be supplied with which to increase this angle to 24 degrees for the cutting of very hard specimens.

A simple object holder is supplied with the instrument but three types of holder can be supplied as follows :

- (1) A plain holder on which paraffin wax blocks are directly cemented.
- (2) A vice holder for a wood block to which the embedded specimen is fixed.
- (3) An orientating holder of very rigid construction.

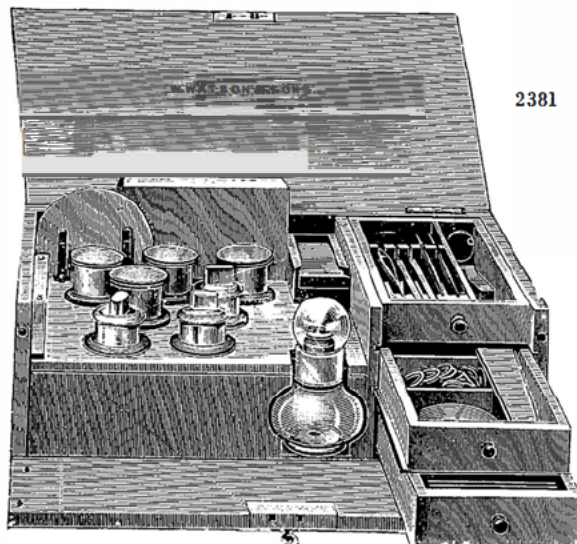
Code Word.	No.		£	s.	d.
Soaps	2371	Flat cutting Microtome with simple knife holder, one 17° knife and handle, and one simple object holder	25	0	0
Soars	2372	Vice holder for wood blocks	2	0	0
Soaxs	2373	Simple Orientating object holder	4	0	0
Soaws	2374	22° Knife	2	0	0
Soayd	2375	17° Knife (Spare)	2	0	0

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313 HIGH HOLBORN, W.C.

MOUNTING MATERIALS



2381

COMPLETE CABINETS FOR MOUNTING

Containing Asphalt varnish, 3 Bottles for Solutions, Brass Table, Canada Balsam, Cells, Cover Glasses, 2 Dissecting Knives, Dissecting Needles, Forceps and Scissors, Glass Slips, Gold Size, Labels, Marine Glue, Spirit Lamp, Spring Clips, Turntable, etc.

Code Word. No.
Sherb 2381

In mahogany case.
£6 10 0

Code Word. No.
Sheri 2382

In polished pine case.
£5 15 0

Code Word.	No.		£	s.	d.
Shell	2383	Brushes for Ringing	...	...	...
Shent	2384	Buff Blocks for cleaning Cover Glasses	...	...	...
Sheph	2385	Clips, Spring Wire, for mounting	...	...	...
Shepo	2386	Mica in sheets 2" x 3" for mounting	...	...	...

COVER GLASSES (Best quality only)

In three thicknesses—No. 1, very thin, approx. .15 mm. No. 2, medium, approx. .21 mm. and No. 3, approx. .3 mm.

Circles, $\frac{5}{8}$ in., $\frac{3}{4}$ in., $\frac{7}{8}$ in. diameter.

Squares, $\frac{5}{8}$ in., $\frac{3}{4}$ in., $\frac{7}{8}$ in. square.

Code Word.	No.	1 oz.	£	s.	d.	Code Word.	No.	1 oz.	£	s.	d.
Sherr	2387	No. 1	...	...	...	Shift	23810	No. 1	...	...	...
Shewd	2388	No. 2	...	...	...	Shine	23811	No. 2	...	...	...
Sibbo	2389	No. 3	...	...	...	Shipp	23812	No. 3	...	...	...

These prices are for not less than 1 oz. of any size or thickness. Only the above sizes regularly kept in stock.

Special quotations for quantities. If in smaller quantities than 1 oz. of any size add 1d. per $\frac{1}{4}$ oz.

Code Word.	No.	
Shore	23813	Smaller, intermediate or larger sizes for not less than $\frac{1}{4}$ oz., can be cut to order at 1/0 per oz. ex.
Shorn	23814	Special Thin No. 1 Covers. Circles, $\frac{3}{4}$ in. diameter only. These are excessively thin—005 inch—for high-power work. Not less than $\frac{1}{4}$ oz. supplied, 17/6 oz.

GLASS SLIDES OR SLIPS

3 x 1 inches, ground edges.

	doz.	$\frac{1}{2}$ gross.	1 gross.
	£ s. d.	£ s. d.	£ s. d.
Shing	23815	"The Student's," greenish tint, thin	...
Shive	23816	Extra thin, white	...
Shoal	23817	Glass Slips, 3 x 1 ins., with round or oval excavation in centre, suitable for pond life, or objects to be mounted without pressure	...
Shook	23818	Blue Slips, 3 x 1 $\frac{1}{2}$ ins., for use with lamp chimneys	...
Shoon	23819	Pot Green, 3 x 1 $\frac{1}{2}$ ins. for use with lamp chimneys	...
Shoot	23820	Adhesive Slide Labels, square, 3 lines, per 100	...
Shopb	23821	Ditto, oval, for 3 x 1 inch slips, per 500	...
		Ditto, square, with printed name or other matter to order, per 1000	...

CELL RINGS

Shosi	23822	Aluminium, thickness $\frac{1}{16}$, $\frac{3}{16}$ or $\frac{1}{2}$ in., diameters $\frac{5}{8}$, $\frac{3}{4}$ or $\frac{7}{8}$ in., per doz. 8d. p. gross	0 7 6
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313 HIGH HOLBORN, W.C.

STAINS AND REAGENTS FOR BIOLOGICAL PURPOSES

These dyes are prepared under standardised conditions and provide a product on which biologists and histologists may rely absolutely as regards purity and consistency to formula.

	5 gms.	10 gms.	25 gms.		5 gms.	10 gms.	25 gms.
Azocarmine	1/-	1/10	3/6	Methylene Blue, Pure Medi-	1/3	2/3	4/6
Azure I, 1 gm. 2/-	9/-	17/9	35/6	cinal	1/6	2/9	5/6
Azure II, 1 gm. 1/6	6/-	11/9	23/6	Methylene Blue Polychrome	1/6	2/9	5/6
Azure A, MacNeal, 1 gm. 2/-	9/-	17/9	35/6	Methylene Violet Berthsen	22/-	—	—
Azure B, MacNeal, 1 gm. 4/6	22/-	—	—	1 gm. 4/6	22/-	—	—
Biebrich Scarlet	1/-	1/10	3/6	Neutral Red	2/6	4/9	9/6
Bismarck Brown	1/-	1/10	3/6	Nigrosin	1/-	1/10	3/6
Bordeaux	1/-	1/10	3/6	Nile Blue	1/3	2/3	4/6
Brilliant Green	1/-	1/10	3/6	Naphthol Green	1/-	1/10	3/6
Congo Red	1/-	1/10	3/6	Orange C.	1/-	1/10	3/6
Crystal Violet	1/3	2/3	4/6	Orange II	1/-	1/10	3/6
Dahlia	1/-	1/10	3/6	Orcein, 1 gm.	3/-	14/-	26/-
Eosin Bluish	2/-	3/9	7/6	Phloxine	1/3	2/3	4/6
Eosin Ethyl	2/6	4/9	9/6	Picric Acid	1/-	—	2/3
Eosin Yellowish	2/-	3/9	7/6	Ponceaus S.	1/6	2/9	5/6
Erythrosine	2/6	4/9	9/6	Pyronine	1/9	3/3	6/6
Fluoresceine	1/-	1/10	3/6	Rose Bengal	2/-	3/9	7/6
Fuchsin Basic	1/-	1/10	3/6	Safranin G.	1/-	1/10	3/6
Fuchsin Acid	1/-	1/10	3/6	Safranin O.	1/-	1/10	3/6
Gentian Violet 50% Dextrin	1/6	2/9	5/6	Soluble Blue with Dextrin	1/-	1/10	3/6
Gentian Violet, extra	1/6	2/9	5/6	Soluble Blue Extra	1/9	3/3	6/6
Indigo Carmine	1/6	2/9	5/6	Spirit Blue	1/6	2/9	5/6
Jenners Stain	3/9	—	—	Sudan II	1/6	2/9	5/6
Light Green	1/3	2/3	4/6	Sudan III	1/6	2/9	5/6
Malachite Green	1/-	1/10	3/6	Sudan IV	1/6	2/9	5/6
Martius Yellow	1/3	2/3	4/6	Thionine	3/6	6/9	13/6
Methyl Blue	1/6	2/9	5/6	Thionine Blue	2/-	3/9	7/6
Methyl Green	2/-	3/9	7/6	Toluidine Blue	2/3	4/3	8/6
Methyl Violet	1/-	1/10	3/6	Vital Red, 1 gm. 2/3	10/-	19/9	—

NATURAL DYESTUFFS AND COMPOUND STAINS

	5 gms.	10 gms.	25 gms.		5 gms.	10 gms.	25 gms.
Aniline Blue, Orange G. Mallory	1/6	2/9	5/6	Gram's Iodine	1/-	1/10	3/6
Azure II, Eosin 1 gm. 2/-	9/-	17/9	35/6	Haemalum	1/-	1/10	3/6
Brazilin, 1 gm.	1/9	7/6	14/9	Haematin, 1 gm. 1/6	6/-	11/9	23/6
Carbol Fuchsin	1/-	1/10	3/6	Haematoxylin	3/-	5/-	12/-
Carbol Gentian Violet	1/-	1/10	3/6	Leishman's Stain	3/9	7/3	14/6
Carmalum	1/6	2/9	5/6	Methyl-Green-Pyronin (Papp-	2/3	4/3	8/6
Carmine, Alum Soluble	1/9	3/3	6/6	enheim)	2/3	4/3	8/6
Carmine, Borax Soluble	1/9	3/3	6/6	Orcein, 1 gm. 3/-	14/-	26/-	—
Carmine, Picro-magnesia	3/-	5/9	11/6	Phlorogucinol Pure	3/6	6/9	13/6
Carmine Acid, 1 gm. 2/-	9/-	17/9	35/6	Pianese 11-lb. Stain	1/-	1/10	3/6
Ehrlich's Acidophilous Mix-	2/-	3/9	7/6	Picro-Indigo Carmine	1/-	1/10	3/6
ture	2/-	3/9	7/6	Romanowsky	3/9	7/3	14/6
Ehrlich-Biondi-Heidenhain-	1/6	2/9	5/6	Tetrachrome MacNeal 1 gm. 1/3	5/-	9/9	19/6
Triple Stain	1/6	2/9	5/6	Van Gieson	1/-	1/10	3/6
Ehrlich's Triacid Stain	1/6	2/9	5/6	Weigert's Elastic Stain Soluble	4/-	7/6	15/-
Giemsa, 1 gm. 2/-	9/-	17/9	35/6	Wrights	3/6	6/9	13/6

PRICE LIST OF STAIN SOLUTIONS

	25 c.c.	100 c.c.		25 c.c.	100 c.c.
Albert's Diphtheria Stain No. 1	1/3	2/9	Carmine :		
Albert's Diphtheria Stain No. 2	1/-	1/-	Alum Acetic	1/3	2/6
Aniline Blue-Orange G. Mallory	1/3	2/6	Alum, Anderson	1/3	3/-
Biebrich Scarlet, Scott	1/3	2/6	Alum, Grenacher	1/3	2/6
Bismarck Brown in 40% Glycerol	1/3	3/-	Alum, Nayer	1/3	2/6
Bordeaux	1/3	2/6	Ammonia, Ranvier	1/3	2/6
Carbol Fuchsin, Ziehl	1/3	2/6	Bests	1/6	2/6
Carbol Gentian Violet, Nicolle	1/3	2/6	Borax Alcoholic, Grenacher	1/6	4/-
Carbol Methylene Blue	1/3	2/6	Magnesia Stock, Mayer	1/3	3/-
Carbol Thionine, King	1/3	3/-	Paracarmine	2/6	7/6
Carbol Thionine, Nicolle	1/3	3/-	Picro, Ranvier	1/3	3/-
Carmalum	1/3	2/-	Picro-magnesia	1/3	3/-
			Cochineal Alcoholic, Mayer's old	2/-	6/6
			Formula	2/-	6/6

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

PRICE LIST OF STAIN SOLUTIONS—Continued

	25 c.c.	100 c.c.		25 c.c.	100 c.c.
Cochineal Alcoholic, <i>Mayer's New Formula</i> ...	2/-	6/6	Methyl Violet ...	1/3	2/6
Congo Red ...	1/3	2/6	Methylene Blue :—		
Ehrlich's Acidophilous Mixture ...	2/-	6/6	Alcoholic Conc. ...	3/6	10/6
Ehrlich-Biondi-Heidenhain Triple Stain ...	1/3	3/-	Aqueous ...	1/3	2/6
Ehrlich's Triacid Mixture ...	1/6	3/6	Carbol, <i>see Carbol Methylene Blue</i> .		
Elastic Tissue Stain, <i>Weigert's</i> ...	3/6	10/6	Eosin, <i>see Leishman's & Wright's stains</i> .		
Eosin Methylene Blue, <i>see Leishman's & Wright's Stains</i> .			Loeffler ...	1/3	3/-
Eosin Yellowish, 1% aqueous ...	1/3	3/-	Nissl ...	1/6	5/6
Gentian Violet, Alcoholic Conc. ...	3/6	10/6	Polychrome ...	1/6	4/3
" " Alcoholic ...	1/3	2/6	Terry ...	1/6	6/-
" " Aqueous ...	1/3	2/6	Unna ...	1/3	3/-
" " Aniline Water, <i>Ehrlich</i> ...	1/3	3/-	Nigrosine W.S. ...	1/3	2/6
" " Carbol, <i>see Carbol Gentian Violet</i> .			Nile Blue for fat, acid ...	1/6	4/-
Giemsa's Stain ...	2/6	7/6	Nile Blue for fat, neutralized ...	1/6	5/-
Glychaemalum ...	1/3	2/6	Orange G. ...	1/3	2/6
Goodpasture's Stain ...	2/-	6/-	Paracarmine, <i>see Carmine</i> .		
Gram's Iodine ...	1/-	2/6	Pasini's Stain ...	2/-	6/6
Haemalum ...	1/3	2/6	Pianese III b Stain ...	1/3	3/-
Haemalum Acid ...	1/3	2/6	Picro-Indigo-carmine ...	1/3	2/6
<i>Haematoxylin</i> :—			Romanowsky's Stain, <i>see Leishman's & Wright's Stains</i> .		
Acid, <i>Ehrlich</i> ...	1/9	5/6	Safranin Alcoholic, <i>Babes</i> ...	2/6	7/6
Delafield's ...	1/3	2/6	" " Aniline Water, <i>Babes</i> ...	1/3	3/-
Phospho-Molybdic acid, <i>Mallory</i> ...	1/3	3/-	" " Aqueous ...	1/3	2/6
Phospho-Tungstic acid, <i>Mallory</i> ...	1/3	3/-	Scharlach R, <i>see Sudan IV</i> .	2/-	6/6
Unna's ...	1/3	3/-	Sudan II Pyridine, <i>Proescher</i> ...	2/-	6/6
Heidenhain No. 1, <i>Iron</i> ...	1/3	2/-	Sudan III Alcoholic ...	2/-	6/6
" " No. 2 ...	1/3	2/6	Sudan III Alkaline Alcohol, <i>Herxheimer</i> ...	2/6	7/6
Held's Molybdic acid ...	1/3	3/-	Sudan III Acetone-Alcohol, <i>Herxheimer</i> ...	2/6	7/6
Weigert No. 1 ...	2/-	6/-	Sudan IV Alcoholic ...	2/-	6/6
" " No. 2, <i>Iron</i> ...	1/3	2/-	Sudan IV Alkaline-Alcohol, <i>Herxheimer</i> ...	2/6	7/6
Indulin-Aurantia-Eosin, <i>see Ehrlich's Acidophilous Mixture</i> .			Sudan IV Acetone-Alcohol, <i>Herxheimer</i> ...	2/6	7/6
Leishman's Stain ...	3/6	10/6	Tetrachrome Stain, <i>MacNeal</i> ...	2/6	7/6
Magenta Acid Aniline Water, <i>Altman</i> ...	1/3	3/-	Thionine Acetic, <i>Frost</i> ...	1/3	3/-
Magenta Acid Aqueous ...	1/3	2/6	Thionine Carbolic <i>see Carbol Thionine</i> .		
Magenta Basic Cone, Alcoholic ...	3/6	10/6	Van Gieson's Stain ...	1/3	2/6
Magenta Basic Collodion ...	1/6	4/3	Vesuvium, <i>see Bismarck Brown</i> .		
Methyl Blue-Eosine, <i>Mann</i> ...	1/3	2/6	Water-Blue-Orcein Unna ...	2/6	7/6
Methyl Green ...	1/3	2/6	Weigert's Elastic Stain ...	3/6	10/6
Methyl Green-Pyronine, <i>Pappenheim</i> ...	1/6	5/-	Wright's Stain ...	3/6	10/-
Methyl Green-Pyronine, <i>Unna</i> ...	2/3	7/-			

BURROUGHS WELCOME & CO.'S

"SOLOID" BRAND MICROSCOPIC STAINS

(TRADE MARK)

"Solid" Microscopic Stains will be found exceedingly useful for the rapid preparation of small quantities of Solution. Each tube contains 6 "Soloid" products.

A descriptive list, in each packet, gives full directions for making up and staining.

Price 1/1½ per packet, excepting those marked otherwise.

The following "Soloid" stains are obtainable :—

	s.	d.		s.	d.
Bismarck Brown, pure ...	0.1	gm.	Gram's Iodine Solution ...	15	c.c.
Borax Methylene Blue ...			Haemalum ...		
Ehrlich Triple Stain ...			Haematoxylin, pure ...	0.1	gm.
Eosin, pure ...	0.1	gm.	Methyl Violet, pure ...	0.1	gm.
Eosin-Azur (for Giemsa Staining) ...	0.038	gm.	Methylene Blue ...	0.1	gm.
Eosin-Methylene Blue (Louis Jenner's Stain) ...	0.05	gm.	Neutral Red ...	0.1	gm.
Fuchsin (Basic), pure ...	0.1	gm.	Romanowsky Stain (Leishman's Powder) ...	0.015	gm.
Gentian Violet, pure ...	0.1	gm.	Thionin Blue, pure ...	0.1	gm.
			Toison Blood Fluid ...		
			Toluidine, Blue ...	0.1	gm.

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

MOUNTING MEDIA, STAINS

241

Code Word. No.		MOUNTING MEDIA, Etc.				s. d.	
Shoul	2411	Asphalt or Black Cement	...	...	...	Per Bottle	1 6
Shout	2412	Bell's Cement	...	...	...	...	4 6
Shove	2413	Canada Balsam, Natural	...	...	...	...	2 0
Shown	2414	" " in Benzole	...	...	...	...	2 0
Shred	2415	" " in Xylol	...	...	...	...	2 0
Shrex	2416	" " Bottle, with neck turned in so that rod can be scraped against edge, with glass rod, capacity about 2 ozs.	...	...	...	...	1 9
Siate	2417	Cedar Oil, for clearing	...	...	...	...	1 0
Shrew	2418	Cedar Oil, thick, for Immersion	...	...	...	...	1 0
Sibec	2419	Deane's Medium	...	...	...	...	1 6
Sieca	24110	Farrants' Medium	...	...	...	...	1 0
Sider	24111	Glycerine Jelly	...	...	...	...	1 0
Shrie	24112	Gold Size	...	...	...	...	1 6
Sifu	24113	Hyrax, a synthetic resin, N. 1-72, in Xylol; ½ oz. bottle 4/6, 1 oz. bottle	...	...	...	...	6 6
Sikan	24114	Styrax, Oriental	...	...	...	...	2 0
Silva	24115	Styrax, American	...	...	...	...	5 0
Shril	24116	Marine Glue	...	...	...	...	1 6
Shrif	24117	Zinc White Cement	...	...	...	...	2 0
Shrof	24118	Clove Oil	...	...	...	...	2 0
						25 grms.	100 grms.
Shrog	24119	Celloidin	...	...	...	8/-	44/-
Shroh	24120	Celloidin Solution, Thick	...	...	...	3/-	11/-
Shroj	24121	Celloidin Solution, Thin	...	...	...	2/-	7/-
Shrok	24122	Dammar Mastie	...	...	...	1/-	2/6
						Pale.	Vert.
Shrol	24123	Euparal, 1 oz.	...	...	...	2/6	3/-
Shrom	24124	Euparal Essence, 1 oz.	...	...	...	...	1/6
Shron	24125	Flemming's Solution, Strong	...	...	...	3/6	12/6
Shrop	24126	Flemming's Solution, Weak	...	...	...	2/6	9/3
Shror	24127	Gum syrup for Freezing Microtome	...	...	...	...	2/6
Shros	24128	Iodine, resublimed	...	...	...	2/-	7/3
Shrot	24129	Oil of Cloves	...	...	...	1/3	4/6
Shrov	24130	Osmic Acid 2%	...	...	...	12/6	42/6
Shrow	24131	Osmic Acid, 1% solution	...	...	...	7/-	25/-
						Paraffin Wax—	
Shrox	24132	Melting point about 120°F. (49°C.) in 1 lb. blocks	...	...	...	—	1/6
Shroy	24133	" " 125°F. (52°C.)	...	...	...	—	1/8
Shroz	24134	" " 130°F. (54°C.)	...	...	...	—	1/8
Shulm	24135	" " 140°F. (60°C.)	...	...	...	—	2/-
Shuvt	24136	Schulze Solution	...	...	...	1/3	3/-

SOLID MEDIA (to order only)

Agar—acid lactose (pH 5.6)	...	...	...	...	...	4/6	24/-	4/6
" —ascitic, 5 c.c. in phials	...	...	...	...	...	6/-	33/-	—
" —Fildes' for B. influenzae, in phials	...	...	...	...	...	4/-	22/-	4/6
" —glycerin, 6 c.c. in tubes	...	...	...	...	...	5/-	28/-	—
" 10 c.c. for plating, in phials	...	...	...	...	...	4/4	24/-	—
" —maltose (Sabouraud's), in phials only	...	...	...	...	...	4/4	24/-	—
" —MacConkey's, in phials (10 c.c.)	...	...	...	...	...	4/4	24/-	4/6
" and bottle	...	...	...	...	...	4/-	22/-	4/6
" —nutrient, 6 c.c. in tubes	...	...	...	...	...	7/-	39/-	—
" nutrient with human blood (mixed or smeared), in phials	...	...	...	...	...	6/-	33/-	—
" Sabouraud's—vide supra, agar—maltose—serum, in phials	...	...	...	...	...	5/-	28/-	—
" —tellurite, for B. diphtheriae, in phials	...	...	...	...	...	—	—	6/-
" —whey (pH 6.8), in bottle	...	...	...	...	...	4/-	22/-	—
Blood serum, Loeffler's, 5 c.c. in tubes	...	...	...	...	...	4/4	24/-	—
" in phials	...	...	...	...	...	12/-	—	—
Bordet's medium for B. pertussis (in plates on loan)	...	...	...	...	...	4/-	22/-	4/6
Celatin (nutrient), in tubes 6 c.c.	...	...	...	...	...	4/4	24/-	—
" in phials	...	...	...	...	...	—	—	—

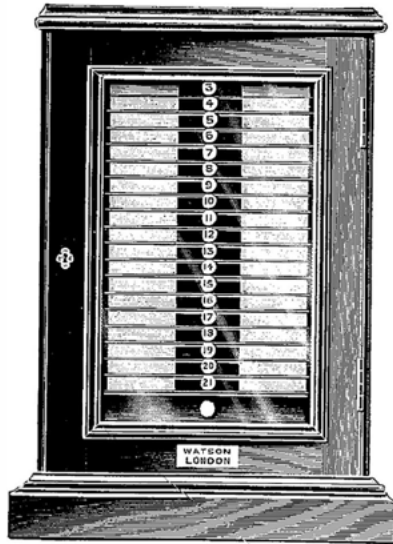
LIQUID MEDIA (to order only)

Broth—acid lactose (pH 5.6), in phial and bottle	...	...	...	...	...	3/4	18/-	3/-
" —MacConkey's glucose, in phial (10 c.c.) and bottle	...	...	...	...	...	3/4	18/-	3/-
" —MacConkey's lactose, in phial (10 c.c.) and bottle	...	...	...	...	...	3/4	18/-	3/-
" nutrient, in phial and bottle	...	...	...	...	...	3/4	18/-	4/-
" —Whey (pH 6.8), in bottle	...	...	...	...	...	3/6	18/6	—
Brilliant—green-bile enrichment medium, in phial 12 c.c.	...	...	...	...	...	3/6	—	—
Bile (ox) in sealed tubes of about 10 c.c.	...	...	...	...	...	4/4	24/-	—
Meat medium for B. acne and other anaerobes, in phial (15 c.c.)	...	...	...	...	...	4/4	24/-	—
" (Ministry of Health's formula) in phial (15 c.c.)	...	...	...	...	...	3/10	21/-	3/6
Milk (phenol red indicator) in phial and bottle	...	...	...	...	...	4/-	22/-	—
Peptone water with fermentation tube and acid fuchsin indicator, containing glucose, lactose, mannite, maltose or saccharose, in phials	...	...	...	...	...	5/-	27/6	—
" do. containing dulcitol, in phials	...	...	...	...	...	—	—	—
All the above can be supplied to order. Unless otherwise stated all are standardised to pH 7.6.								
Other media will be made to order or special formula (in quantities of not less than 2 dozen tubes or in bulk in ½ litre bottles) from								
Sterilized plugged tubes	1/2	6/-	—
Sterilized phials	1/6	8/-	—

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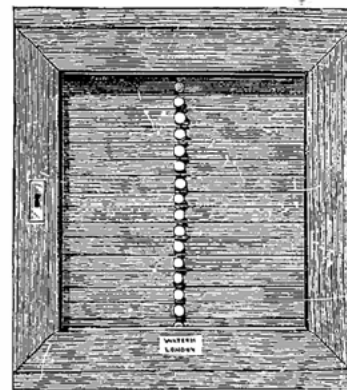
2425

MICROSCOPIC OBJECT CABINETS AND BOXES

★ ★ ★

Estimates submitted for any size or style of cabinet, in any suitable wood, for any climate, with plain or metal bottom trays on receipt of enquiry or specification.

★ ★ ★



2421

Code Word.	No.		£	s.	d.
Punie	2421	Neatly-made Cabinet of polished pine, with glass door, lock and key to hold 200 objects, as figured ...	2	10	0
Punch	2422	Ditto, ditto, 500 objects ...	4	10	0
Punti	2423	Ditto, ditto, 1000 objects ...	7	15	0
Pudef	2424	Mahogany Cabinet of superior workmanship with mouldings top and bottom, to hold 280 objects, each drawer numbered, with an extra deep drawer for materials etc.	10	0	0
Pupil	2425	Large handsome Mahogany Cabinet to hold 500 objects, each drawer numbered and furnished with porcelain plates, as figured ...	15	0	0
Puppy	2426	Ditto, ditto, to hold 1,000 ...	21	0	0

MICROSCOPE SLIDE BOXES

Cloth-covered Cardboard Boxes, with drop fronts, white cardboard trays with linen-jointed flaps.

No.		s.	d.
2427	With 6 trays to hold 54 slides flat	3	0
2428	" 12 " " 108 "	5	6
2429	" 16 " " 144 "	6	9

Polished Wood Object Boxes, with partitioned trays.

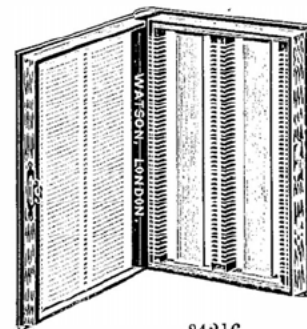
24210	To hold 1 dozen slides in 2 trays	3	0
24211	" 2 " " 4 " "	4	0
24212	" 3 " " 6 " "	6	0
24213	" 4 " " 8 " "	8	0
24214	" 6 " " 12 " "	11	0
24215	" 12 " " 12 double trays	15	0

Rack Boxes. The most convenient form for storing quantities of specimens for teaching or for those with restricted space.

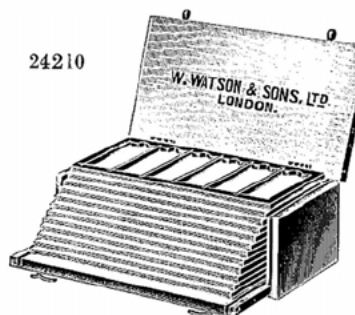
24216	Cloth covered, book form, with index, for 100 slides	6	3
24217	Black cardboard, with index for 100 slides	4	0
24218	Wooden boxes, semi-polished, folding, with index, to hold 100 slides	4	0

Folding Pocket Cases, flat.

24219	To hold 12 slides	2	9
24220	To hold 6 slides	2	0



24216



24210

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PREPARED OBJECTS FOR THE MICROSCOPE

So typical as to be almost diagrammatic, perfect examples also of microtomy, staining and mounting.

For more than fifty years we have maintained the premier position in the scientific world for the supply of highest class Microscopic Objects, and they are in universal use for Biological, Medical and Industrial study, book illustrations and other purposes, including the varied interests of the amateur.

No worker who values his Microscope as an aid to Natural Science should fail to provide himself with our Illustrated Classified List of Microscopic Objects (Part 3), which forms a separate publication. The stock of slides numbers over 40,000. The slides are prepared by experts, each of mature experience in his speciality. The objects are, therefore, fitted to be used in the most critical manner. As standard specimens for demonstrations and students they are unsurpassed.

The Microscope is constantly extending its field of usefulness and new branches of research have consequently to be provided for; especially is this the case in numerous manufacturing processes; new specimens are therefore continually being added to our cabinets to assist workers, and correspondence is always invited.

The following subjects are fully dealt with:—Botany, Comparative Anatomy, Diatomaceæ and Foraminifera, Entomology, Geology, Palæontology, Histology, Pathology, Parasitology, Bacteriology, Marine and Fresh Water Life, Polariscope Specimens, Public Health Series, Textiles, Tropical Diseases, Zoology, etc.

Amateurs are strongly recommended to investigate the particular sections which appeal to them. It is always possible to obtain for selection a large number of striking preparations.

It is our endeavour to maintain our stock in such a condition of completeness that we may be in a position to despatch any specimen that is quoted in our catalogue immediately; but it sometimes happens that a temporary cessation in the supply of material occurs, or the time of the year may not be suitable for obtaining gatherings and, in consequence, delays may be experienced. We suggest, therefore, that when an order is given, extra alternative specimens may be named, to replace any that might be temporarily out of stock.

Special attention is drawn to the staining methods, by means of which all the tissues are differentiated, thereby aiding demonstrators very considerably.

Our exceptional facilities enables us to prepare objects for the Microscope from customers' materials to the greatest advantage. This service is proving of daily help to industrial firms. Special care is displayed in such work.

Every slide is examined before being placed in stock, and special care is taken in selecting specimens when forwarding; satisfaction to customers is assured by this means. We claim for our Objects a quality superior to the usual commercial level and it will always be our aim to maintain this.

We beg that you will take the opportunity of proving the excellence of our specimens by entrusting us with your orders and kind recommendations.

On the next page are several standard sets, which are typical of the subjects in the general collection.

W. WATSON & SONS, LTD.



313 HIGH HOLBORN, W.C.

CABINETS OF MICROSCOPIC OBJECTS

COMPLETE FOR PRESENTATION, Etc.

Code Word.	No.	PRICES	£	s.	d.
Prope	2441	Handsome Mahogany Cabinet of finest workmanship and finish, containing 1000 objects of varied interest. Each specimen is a carefully selected example of the subject it typifies. Many novel and interesting preparations are included, Anatomical, Entomological, Zoological, etc., also many rare Diatomacæ, Foraminifera and Radiolaria, forming a collection of the highest order, eminently suited for presentation. Each drawer has a tablet of its contents	97	10	0
Prose	2442	Handsome Mahogany Cabinet, equal to the above in every respect, but containing 500 objects	50	0	0
Pushe	2443	Mahogany Cabinet, as above, containing 280 objects, all carefully selected, including many novel and attractive slides for exhibition purposes, as well as a large number of rare specimens of Zoological interest, etc.	29	5	0
Prote	2444	The Student's Cabinet , of polished pine with glass door, lock, and key, containing 200 preparations, illustrating Anatomy, Bacteriology, Pathology, Physiology, Urinary Deposits, etc.	22	10	0
Proud	2445	The Amateur's Cabinet , containing 200 specimens of general interest—Botanical Sections, Crystals for polariscope, Diatomacæ, Entomological Objects, Foraminifera, Hydrozoa for Dark Ground Illumination, Soundings, all of the highest quality	18	10	0
Prove	2446	Pine Case, containing 72 objects of General Interest, all carefully prepared and selected	6	5	0

Other Microscopic Object Cabinets made to any size or style and furnished with slides typical of any required subject.

EDUCATIONAL SERIES FOR STUDENTS

BOTANY

Prows	2447	Two sets of Typical Structures, the first being 24 Elementary Tissues, and the second illustrating the Comparative Anatomy of Plants. These have been adopted by the London County Council for use in their Technical Classes, Series 33 in case	£	s.	d.
			2	2	0
Prune	2448	35	2	3	6

EMBRYOLOGY

Pryor	2449	Six slides, illustrating the development of a Chick, mounted in Canada Balsam, showing with great distinctness the nervous and circulatory system, etc., in case	1	5	0
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EXHIBITION SLIDES

Pruce	24410	An attractive selection of 36 interesting objects, many of which are quite novel in character, including slides for Polariscope and Dark Ground Illumination	3	10	0
Pufti	24411	Forensic Medicine. —Set of twenty-four slides of hairs, blood corpuscles, starches, etc., as suggested by R. Henslowe Wellington, Esq., M.R.C.S., L.R.C.P., Barrister-at-Law, etc.	2	2	0

GEOLOGY

Pukeo	24412	Twenty-four Typical Rock Sections, sedimentary, metamorphic and igneous. The series will be found very useful for Petrological candidates for the B.Sc. degree	2	15	0
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PHYSIOLOGY

Pulls	24413	Four complete sets (Nos. 67-73) each set containing 24 Typical Tissues, each a selected example of its kind. The complete series illustrates the Standard Text-books of Histology. Per set of 24, in case	2	2	0
		Ditto, complete set of 96 slides	8	8	0

PUBLIC HEALTH

Pulse	24414	Seventy-two specimens, suitable for candidates for the Diploma, as approved by Dr. F. J. Allan and mentioned in his "Aids to Sanitary Science"	6	15	0
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ZOOLOGY

Pumps	24415	Twenty-four selected specimens, Cœlenterata, Infusoria, Polyzoa, Protozoa, Vermes, etc. Many of these, apart from their Biological interest, will be found of great value as exhibition objects. In case	3	0	0
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POLARISERS AND ANALYSERS



2452



2459



2454

Complete Sets, suitable for all Standard Microscopes.

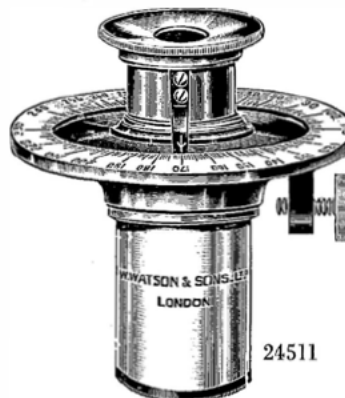
The Polarizer slides into a standard substage or understage fitting and is provided with rotary movement. The analyser can be screwed into a nosepiece, body-tube or draw-tube, receiving at its lower end any objective having the standard screw.

Code Word.	No.	PRICES	£	s.	d.
Purre	2451	Polariser and analyser, small size...	1	10	0
Purge	2452	Medium size polarizer and analyser	2	5	0
Purga	2453	Medium size polarizer only	1	10	0
Purqb	2454	Medium size analyser only	0	15	0
Purlo	2456	Large size polarizer and analyser	3	2	6
Purla	2457	Large size polarizer only	1	17	6
Purlb	2458	Large size analyser only	1	5	0
Purse	2459	Extra for rotary movement to either of these Analysers	0	7	6

A disc of Selenite is supplied with sets
2451, 2452, 2456.



24510



24511

Pyred	24510	Polarizer , with large prism, rotated by milled graduated flange, with fixed pointer and spring detent at quarter circles	3	10	0
Polpe	24511	Analyser Eyepiece with Divided Circle , consisting of a Huyghenian eyepiece with cross webs, circle graduated in degrees, with large field square-ended prism mounted to rotate over the Eyepiece, rotation being read by means of a pointer.	4	5	0
Poley	24512	Universal size	5	0	0
Polkx	24513	Large size	0	15	0
		Extra for slotting eyepiece to receive Calcspars plate, Bertrand quartered quartz plate, etc.			

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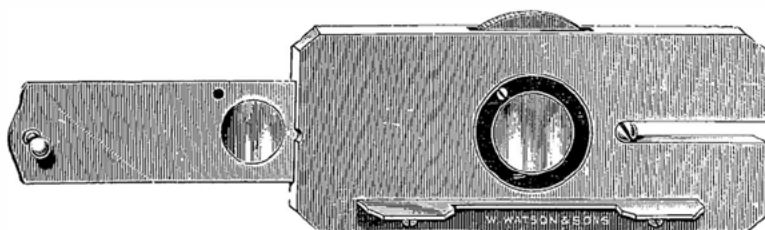
POLARISCOPE-SELENITES



2461

PRICES

Code Word.	No.		£	s	d.
Prose	2461	SELENITE STAGE , as figured, with pinion to rotate the central well carrying the Selenites. With a set of 3 Darker's Best Selenites, having P/A marked on each, complete	3	15	0



Mica-Selenite Stage. 2462.

MICA-SELENITE STAGE

Promi	2462	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. Thus a variety of colours is obtainable, giving very fine effects. It can be used on any Microscope.	2	12	6
Prone	2463	Selenites mounted on 3 by 1 slips, 3 varieties	0	2	6
Proni	2464	Mica Films, according to size, mounted in circles or on 3" x 1" slips	0	2	6

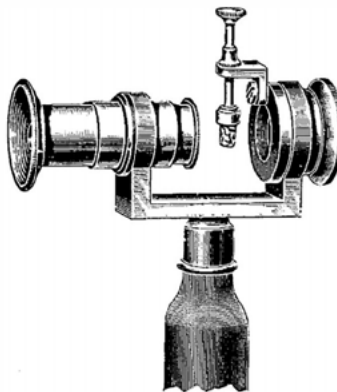
Bi-axial Crystals, Etc. See Catalogue, Part 3.

IMPROVED DICHROSCOPE

Code Word. No.

Preer 2465 This improved model is provided with a revolving stage fitted with a small cup filled with wax for holding the mineral. This cup can be raised or lowered and rotated in two azimuths. It can be thrown right out of the field to allow of the careful adjustment of the object on the wax. The ocular and prism slide through a tube for focussing

£3 15 0



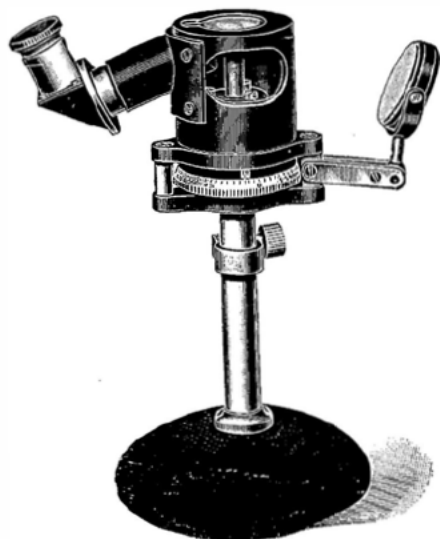
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REFRACTOMETERS

GEM REFRACTOMETER

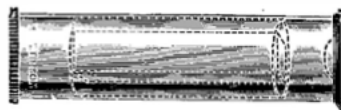


Although primarily designed to meet the requirements of jewellers and dealers in precious stones, this instrument does practically all that is necessary for the mineralogist, physicist and chemist. The refractive index of the substance under examination is read off direct on a scale in the telescope and is accurate to two or three units in the third place of decimals; the range extends from 1.40 to 1.79. To facilitate the measurement of double refracting substances the dense flint hemisphere is made to rotate on a circle divided to every 5°. The hemisphere is surrounded with a light-tight casing provided with a shutter which allows of illumination by either reflected light or light at glancing incidence at will. The large aperture at the side of the casing is for cleaning the hemisphere, which operation should be performed with the greatest care. The stand is adjustable for height.

Code Word.	No.									£	s.	d.
Prefr	2471	As described, in cabinet	...	...	...	...	...	...	...	20	0	0
Preto	2472	Nicol prism to fit ocular of above	...	...	...	...	...	...	...	2	10	0

DICHROSCOPE

Predi 2473 This instrument is for the accurate comparison of the different colours of Dichroic minerals. It is extremely useful for distinguishing gems from coloured glass imitations ... £1 17 6



GONIOMETER EYEPIECE



An important part of the study of crystallography consists in the measuring of the interfacial angles on the crystals of all minerals. For this purpose a goniometer eyepiece has been devised, and this takes the form of an eyepiece of universal size (.9173 ins.), fitted with a circle divided to $\frac{1}{2}$ degrees with vernier reading to one minute. One spider web is fixed 0° 180°, while the other moves round with the circle.

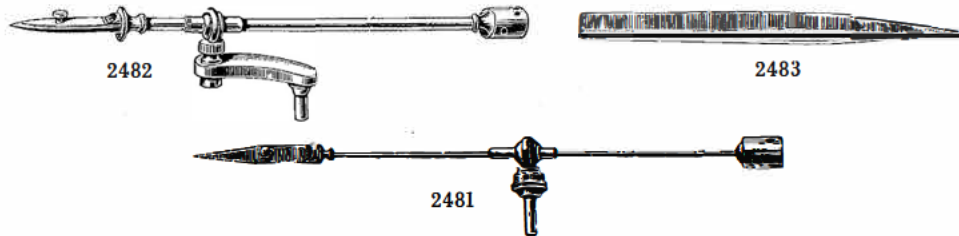
Code Word.	No.									£	s.	d.
Preli	2474									5	0	0

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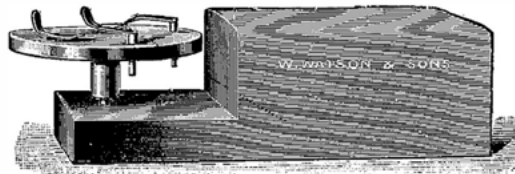
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STAGE FORCEPS



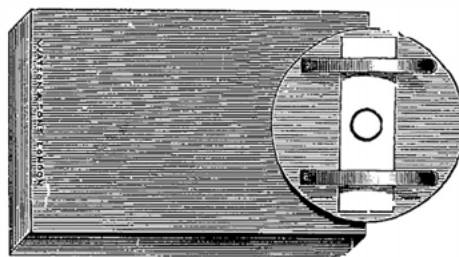
Code Word.	No.	PRICES	£	s.	d.
Procu	2481	Forceps, to fit into stage or limb of Instrument to hold objects during examination	0	12	6
Prodi	2482	Ditto, ditto, best quality	1	1	0
Produ	2483	Brass Hand Forceps, straight	0	1	6

TURNTABLES



2484

Prode	2484	The "Facile" Ball bearing Turntable. An improvement on all existing patterns. In this form the table is balanced in the ordinary way on a hardened steel pin and rotates on a dead hard steel ball, thus reducing friction to a minimum, and ensuring a smooth and steady revolution. The hand support is placed high, enabling a controlled application of the brush. The brass table is engraved with a circle which exactly encloses a 3 x 1 slip, thus giving instant centring	1	2	6
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2485

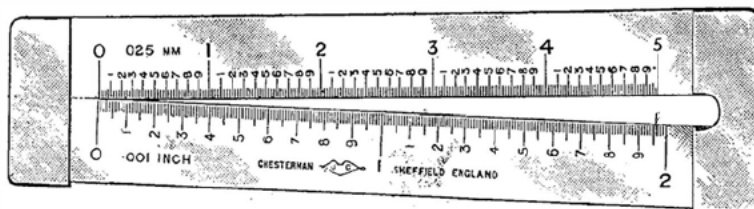
Promo	2485	Turntable, ordinary pattern, as figured ; very efficient	0	10	6
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MICROMETER RULE



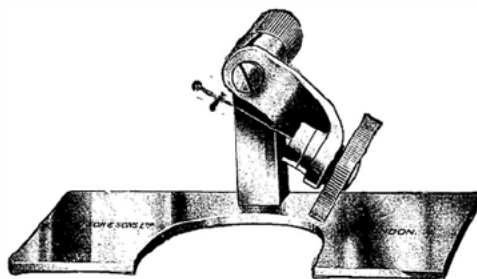
Mr. E. M. Nelson's Micrometer Rule measures objects not larger than $\frac{2}{10}$ inch to $\frac{1}{1000}$ inch or 25 micra. It therefore will be found useful not only to physicists, engineers, manufacturers, etc., but also to microscopists. The thicknesses of slips, cover glasses, etc., can be read off at sight, without having to turn a screw or use a lever or slide. As the scale is so simple in construction it is necessarily cheaper than the various instruments now employed for the purpose. At the back of the Micrometer scale is an Imperial Standard Wire Gauge, extending from 5 to 33; also scales of inches in $\frac{1}{8}$, $\frac{1}{10}$, and smaller divisions are ruled on the edges. It measures $5\frac{1}{4} \times 1\frac{1}{8}$, and so is quite portable.

Code Word. No.
Shibb 2491

PRICES

£ s. d.
0 15 0

INSECT HOLDER



By means of this piece of apparatus, which is constructed to give rotary movements in two directions, the whole surface of an imhaled insect may be brought into view. The socket is filled with cork, to receive the pin, and may be set at any angle to objective.

Code Word. No.

Shibt 2492 Insect holder complete

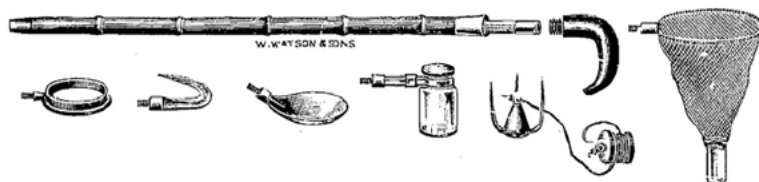
£ s. d.
1 1 0

Shibw 2493 PINHOLE EYEPiece for Centring. This consists of a dummy eyepiece, with a pinhole in a metal disc, in place of the usual eyelens, and constitutes a distinct aid when centring the condenser to the rest of the optical system.

. For universal size tube
For 1.27" size tube

£ s. d.
0 5 0
0 10 0

POND AND ROCK POOL COLLECTING STICK



The Stick is of Bamboo, with an inner extensible rod which is removed by unscrewing the ferrule cap and not as illustrated. Crook handle of Horn.

The outfit consists of the Stick, with two wide-mouth bottles and metal clip for same, metal ring for net, cutting hook, metal spoon, triple drag hook with line and reel.

Code Word. No.

Ponds 2494 Price ...
Ponds 2495 Bolting silk of very fine mesh, sufficient for net, per piece ...
Ponds 2496 Square Net, metal rim fitted with bolting silk and glass tube ...

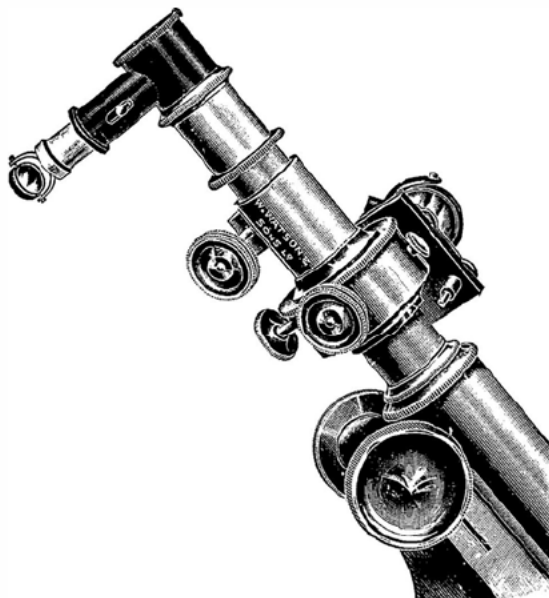
£ s. d.
1 12 6
0 5 0
0 8 6

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SPECTROSCOPE FOR MICROSCOPE



Code Word. No.
Mispe 2501

PRICES

£ s. d.

With the aid of a Micro-spectroscope, the position of the lines of emission and absorption spectra may be read off directly in wave lengths. The spectra of different objects may be viewed side by side by means of a comparison prism, which can be turned aside when not required. This apparatus is valuable in certain forms of advanced research, Pathological and Forensic work. The illustration serves only as a guide, we reserve the right to vary the design. The micro-spectroscope takes the place of the ordinary eyepiece, and is clamped into position by means of a screw to the drawtube top

21 0 0

POCKET SPECTROSCOPES

2503



Crisp	2502	Pocket Spectroscope, with fixed slit, 3 prisms	1 15 0
Bispe	2503	Pocket Spectroscope, with adjustable slit, 5 prisms, achromatic object glass, in case	3 15 0
Trisp	2504	Pocket Spectroscope, with achromatic object glass, 5 prisms, comparison prism, in case	4 7 6
Krisp	2505	Pocket Spectroscope, with adjustable slit, 5 prisms, achromatic object glass, micrometer scale, in case	6 10 6

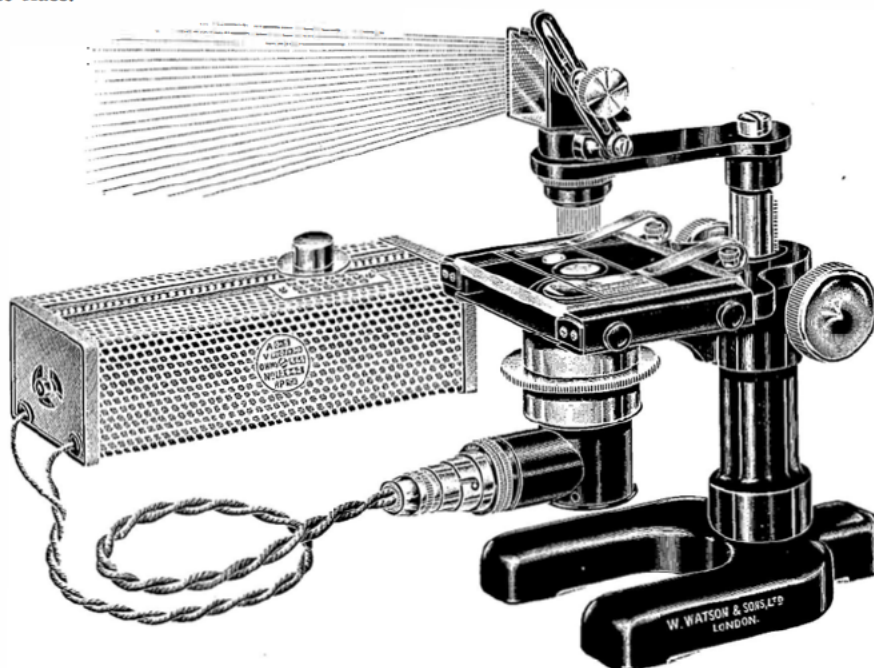
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MICRO-PROJECTION IN THE CLASSROOM

For lecture-demonstrations of microscopic specimens no method is so satisfactory as projection on a screen. Every detail may be pointed to and it is only necessary to do this once for the whole class.



The most practical micro-projector yet devised is shown in the illustration. As will be seen, it is a strongly-built microscope focussing by rack and pinion, with heavy cast-iron foot and large horizontal stage with plate-glass surface. Light is provided by a special substage projection lamp consuming 36 watts and working at 12 volts, the current being obtained from a transformer connected by ordinary lamp flex to any A.C. house supply. A condenser is fitted above the lamp to illuminate a large field evenly and brilliantly. The projection lens is a triple achromatic combination giving a brilliant image magnified 80 diameters on a screen at 15 ft. distance. The beam is reflected in a horizontal direction by a large prism which also corrects the transposition which occurs with simple projection on an opaque screen. The horizontal stage is more convenient for mounted objects than a vertical one, and is, of course, the only possible means of exhibiting unmounted objects or objects in fluid and chemicals in suspension or solution.

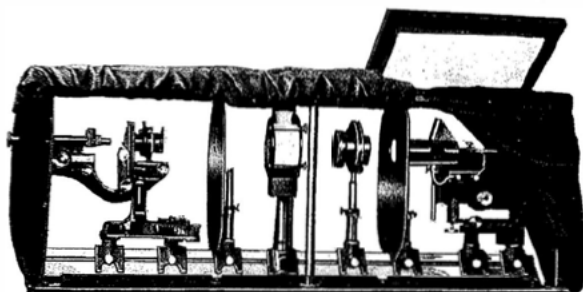
This type of micro-projector has been found very useful for demonstrations in pharmacology, in which the structural characteristics of drugs and their reactions may be seen by a class of students, but it has a much wider application in the teaching of biology and chemistry in schools, and may be recommended as the most easily managed apparatus made for that purpose.

Code Word.	No.	PRICE	£	s.	d.
Polot	2511	School Micro projector, complete as described, with transformer for any specified A.C. supply	10	10	0
		With resistance for any specified D.C. supply, add to above price.			
Poxot	2512	100-125 volts	2	15	0
Pomot	2513	200-250 volts	4	0	0

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APPARATUS CASE

The apparatus consists essentially of a triangular bar mounted upon a mahogany board and carrying an arc lamp with clockwork drive and precise, spring loaded centring adjustments. Mounted beyond the lamp is a light baffle shield with iris diaphragm with iris diaphragm and centring screws and its high order of correction ensures efficient utilisation of the light source with freedom from colour fringes. Water cooling trough of ample dimensions serves to protect delicately stained specimens from damage. Another light baffle shield with iris diaphragm is mounted between the cooling trough and microscope substage condenser. The microscope is the Service model fitted with Service mechanical stage and Research substage. The Research substage with its co-axial condensers permits immediate interchange from low to medium or high power projection. The Service mechanical stage gives steady and responsive movement over the whole specimen allowing the best field to be selected with ease. The 34 mm. draw-tube of the Service microscope allows all light from the objective to proceed to the Eyepiece but with freedom from glare or internal reflections. The whole apparatus is covered with asbestos lined mahogany board and surrounded with light excluding curtains having divisions for the lecturer or assistant to insert the specimen.

In micro projection the steadiness of the source of light is of fundamental importance. The arc lamp supplied with this equipment is manufactured in Watson's High Barret Factory and it is used in combination with a specially designed resistance board. The fluctuations of mains current are known to all users of scientific apparatus. This board is fitted with ammeter and voltmeter, and sliding resistance. Fluctuations in current can be read off immediately and the flow of current maintained at the optimum pressure. By these means the crater is held steady for long periods.

MICRO PROJECTOR, complete with microscope and accessories :

Code Word.	No.		£	s.	d.
Narbo	2521				
"Service" Microscope mounted on plate carrier on two saddles, with: Research pattern Substage with centring screws, and built in iris diaphragm, complete with dovetail slides to receive condenser changers and two Condenser Changer Slides with independent centring			21	15	0
"Service" pattern attachable mechanical Stage, with 3 in. horizontal, 35 mm. vertical motion, fitted with scales and reading by verniers to 0.1 mm.			9	5	0
Abbe Condenser Optical Part to fit to substage slide			1	5	0
Low Power Condenser Lens, to fit to substage slide			0	15	0
Projection Eyepiece x 6			2	10	0
Objectives—Parachromatic series 2 in. 0.15 N.A.			2	0	0
" " 3 in. 0.28 N.A.			1	12	6
" " Apochromatic 4 mm. 0.85 N.A.			9	0	0
" " 2 in. Oil Immersion			5	10	0
Micro Projection Apparatus consisting of: Arc Lamp and Clockwork Drive with special Hood to eliminate the maximum of stray light			8	10	0
Special adjustments both horizontally and vertically for centring on saddle			15	10	0
Adjustable resistance set consisting of: Board having mounted thereon Zenith resistance, voltmeter and independent switch			10	0	0
Special Achromatised Aplanatised Lamp Condenser mounted with adjustment for height, centring screws and clamp to centring, iris diaphragm			10	15	0
Light Shield, adjustable for height provided with 2 in. iris diaphragm			2	5	0
All the above mounted on saddles					
Triangular Bar			2	10	0
Cover Board with side curtains			4	15	0
Cooling Trough, on saddle			4	15	0
Mahogany Base and Mounting			4	10	0

If, however, it is supplied as a complete outfit, a special charge of £4 17 6 is made for the final adjustment, and this charge includes the engraving of the triangular bar to show position of each unit, the supplying of a case to contain objectives, eyepieces, etc., and also the supplying of 25 pairs of carbons.



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PROJECTION APPARATUS

EPIDIASCOPE

No Epidiascope can claim to have fulfilled all the purposes originally claimed by its sponsors, but it does, by obviating the necessity for the perpetual production of lantern slides, afford considerable assistance to the Lecturer, allowing him to emphasise points by projecting text book illustrations, tables, etc.

WATSONS do not manufacture Epidiascopes but in recent years, in response to enquiries from their many clients, they have from time to time supplied such instruments as seemed to be the best available. Owing to the fact they are not manufacturers of these instruments and have no intention of undertaking such work they are able to give unbiassed advice.

In their opinion the ALDIS Epidiascope is at the moment the most efficient of all the medium-priced Epidiascopes and incorporates many features which are unique.

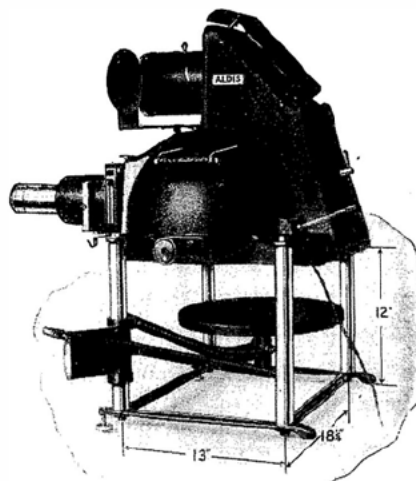
The originality of the designer has completely overcome the need for fans to keep the specimen cool and it was found by comparative test that this Epidiascope is the coolest of all within its price range. Any Lecturer will appreciate the freedom from irritation implied by the absence of a fan. The change from Diascopic to Episcopic projection is effected by a gauged connecting rod and the movement through 90° of the lens cap arm effects immediate change over. The movement is positive, controlled by two rods and cannot get out of order.

The brilliancy of projection is all that can be desired, a system of internal mirrors, mathematically designed and adjusted ensures a shadow-free image, while a 500 w. lamp will be found to give a projected image as brilliant as that attained by many other projectors with a 1000 w. lamp and all its additional heat. By a simple but extremely effective device the illumination between the two forms of projection is reasonably well balanced.

The Object Table is circular and books or diagrams can be orientated by the operator by watching the projected image on the screen; all fumbling and loss of time is eliminated. Simple movements permit accommodation of books of any thickness while the whole table may swing aside to accommodate large specimens such as skulls, museum jars, terrestrial globes, etc.

At the suggestion of Professor Goodrich of the Zoological Department, Oxford University, an attachment for oblique illumination for the projection of fossils, etc., has been introduced.

An ingenious diagram changer is available with accommodation for thirty diagrams sufficient to illustrate a complete lecture. This can be loaded beforehand and each diagram is brought into the field by a single movement.



Code Word.		No.	PRICES				£	s.	d.
Marbu	2531	Epidiascope complete with both projection lenses, curtain, etc.	...	...	...	...	42	0	0
	2532	Diagram Changer for above	...	...	...	...	5	0	0
	2533	Lamp, any voltage	...	...	...	...	1	6	0

Full illustrated leaflet will be sent gratis on request. Demonstrations gladly given by appointment.

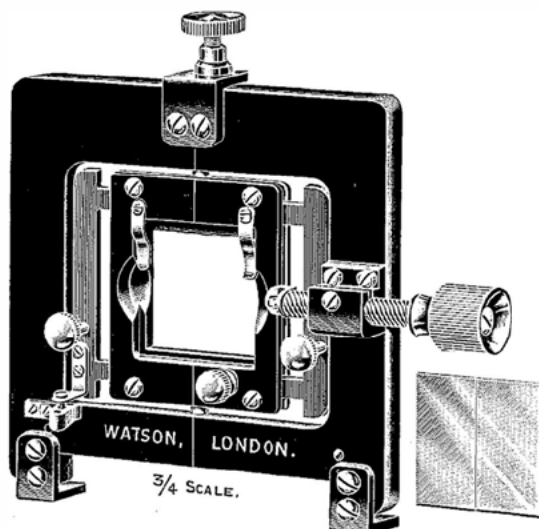
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A TILTING STAGE

FOR TAKING STEREOPHOTOMICROGRAPHS AT ALL MAGNIFICATIONS



designed by

Dr. John R. Baker

*University Lecturer in Zoology
at Oxford*

DESCRIPTION

The Tilting Stage has been primarily designed to be attached to the built-in mechanical stage of Watson's "Edinburgh 'H'," "Research," and "Royal" Microscopes; but the makers will adapt it to suit other built-in stages if possible. It is fastened to the upper plate of the mechanical stage by means of the two lugs at its lower edge and a clamping screw.

The Tilting Stage is designed to take microscope slides one-half millimetre in thickness and 25 × 25 mm. square. This thickness ensures that the object is on the line on which it is rotated. The slide drops into the

rebated opening in the frame, and is held in place by springs. The frame slides upon the tilting frame, being moved along it by the screw, and clamped in position. The tilting frame is held parallel with the stage by a spring detent but may be tilted $7\frac{1}{2}$ degrees to the left or right by depressing the milled projections. The tilting frame turns on its axis. By means of a special slide engraved with a guiding line the axis of rotation must be made to intersect the optical axis of the microscope.

CAPABILITIES

Stereophotomicrographs may be obtained with the aid of the Tilting Stage at any magnification. The appliance may be used as an easy means of securing stereoscopic photographs with the lowest powers, the results being similar to those produced by means of the "Greenough" Binocular Microscope. The apparatus was developed with a view to its use with moderate and high powers, and is recommended specially for those magnifications with which good stereoscopic pictures have hitherto been unobtainable. The claim that oil-immersion objectives may be used with it to advantage is substantiated by results, but it is necessary, of course, that the objective should have sufficient working distance to allow the required amount of tilt in the specimen. Watson's Versalac Oil-Immersion Objective is recommended as being suitable in this respect. Homogeneous oil contact both above and below the slide obviates any possible ill effects of the tilt on the image, and both objective and oil-immersion condenser may be used as for critical work. Good images are also obtained with high-power dry objectives and ordinary condensers.

Owing to the lack of penetration of objectives having large numerical apertures the stereoscopic effect cannot be as pronounced with them as with low powers and to strengthen the effect it may sometimes be considered advisable to use a somewhat smaller cone of illuminating rays than would be used in ordinary observation. With objectives having a focal length of about 12 mm. the stereoscopic effect is very marked and most valuable in its elucidation of structure.

Stereophotomicrographs are more effective in the case of separate objects having structure at different planes.

Code Word.	No.	Price	£	s.	d.
Matcy	2551	Baker-Watson Tilting Stage, as arranged for attachment to the mechanical stages of the "Edinburgh 'H'," "Research," and "Royal" Microscopes, complete with engraved glass setting plate ...	12	10	0
Matcu	2552	Glass Slides, square, 25 × 25 mm., $\frac{1}{2}$ mm. in thickness ... per dozen	0	2	0

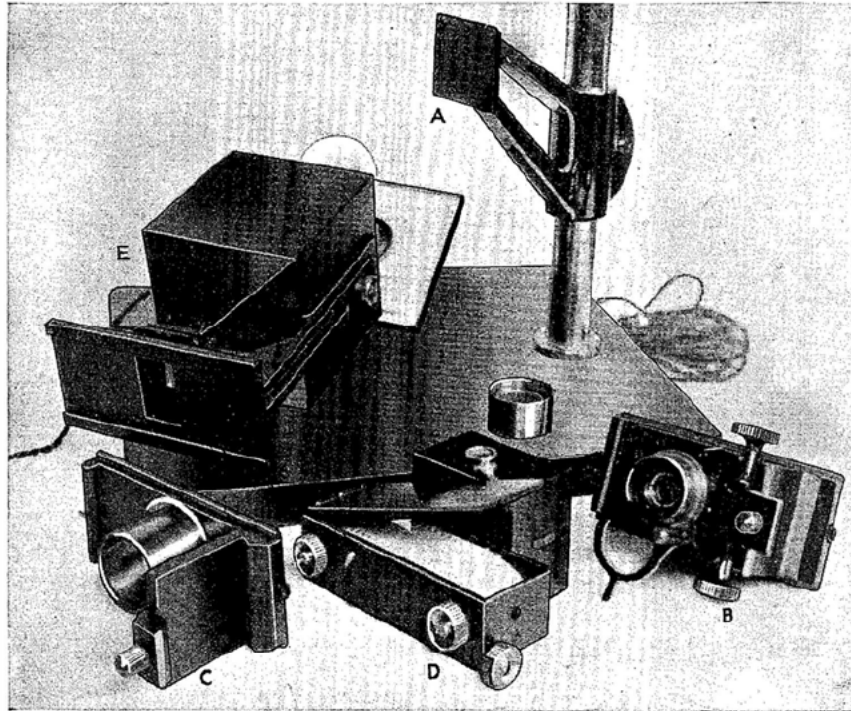
Full explanatory leaflet on request; instructions for use accompany each stage.

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THE SAYCE-WATSON CAMERA



TECHNICAL PHOTOGRAPHY

Photographic work in academic institutions and industrial undertakings, by reason of its varied nature and the complexity of its problems, has hitherto required a diversity of apparatus, an abundance of space and a high degree of personal skill.

These considerations have undoubtedly prevented the full exploitation of photography in directions where it might, if more conveniently available, be of great service, as, for instance, in the production of:

Copies from books, maps, plans, diagrams and other documents.

Photographs of specimens, apparatus and machines.

Photomicrographs of biological, mineral and metal specimens.

Lantern slides and enlargements upon paper from all the foregoing subjects.

The apparatus usually required for dealing with such a variety of output is elaborate and expensive, for each type of work has needed its own specific equipment.

All such equipment may now, however, be replaced by the Sayce-Watson Universal Camera.

Send for Catalogue of Photographic Cameras and Lenses

W. WATSON & SONS, LTD.

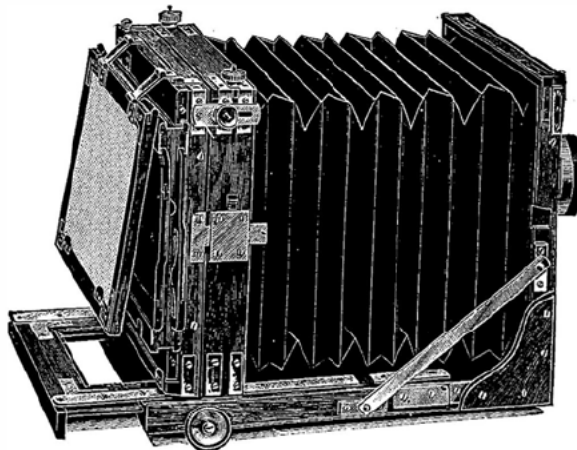


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THE CAMERA FOR SCIENTIFIC RECORDS

Photography is now a normal feature in all scientific and technical research, and there are numberless occasions for the use of a good photographic camera of general utility. Photographs of materials before and after treatment, photographs of apparatus, plant and equipment, copies of plans, diagrams, graphs, tables, charts, book illustrations, these and other records may be made by the use of a single camera of suitable design. The type of camera which is most suitable for general photography and copying is represented most perfectly by Watson's "Premier" Camera. This camera is designed with all the movements which are necessary combined with the most rigid construction. The materials employed are selected with care for durability in all circumstances.

WATSON'S "PREMIER" CAMERA

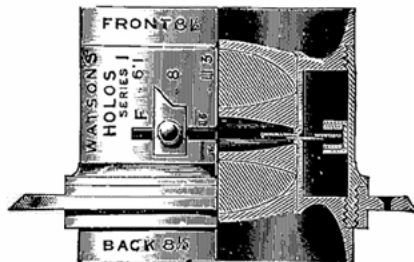


Specification.—The camera is constructed of well-seasoned mahogany and has the highest degree of strength, durability and rigidity. The front is fixed and braced; the back moves for focussing either by slide or rack and pinion motion. The lens panel provides rise, fall and cross movements and the back body has swing motions in vertical and lateral directions. The double dark slides are made in book form with hinged shutters, and can be provided with flat film sheaths.

This camera is made in five sizes as follows:

$6\frac{1}{2} \times 4\frac{3}{4}$ in. (half-plate); $8\frac{1}{2} \times 6\frac{1}{2}$ in. (whole-plate); 10×8 in.; 12×10 in.; and 15×12 in.

WATSON'S HOLOSTIGMAT LENSES



The Finest
Photographic
Lenses
obtainable

Watson's Holostigmat Lenses are double cemented anastigmatic lenses with most perfect corrections for colour, spherical aberration, coma, astigmatism, curvature and distortion. Each half of the system is independently corrected for coma and astigmatism and may be used alone. There are only four glass-to-air surfaces, thus ensuring freedom from false reflections and haze. These lenses have been proved to be more brilliant and consequently more rapid than other lenses of larger aperture.

Watson's Holostigmat Lenses have found permanent favour among expert photographers for copying works of art and for wide-angle views, that is to say, for work in which perfect correction for coma, astigmatism and distortion are most valuable.

Write for Catalogue of Cameras, Lenses and Photographic Apparatus, Department 1. Sent Post-free.

W. WATSON & SONS, LTD.

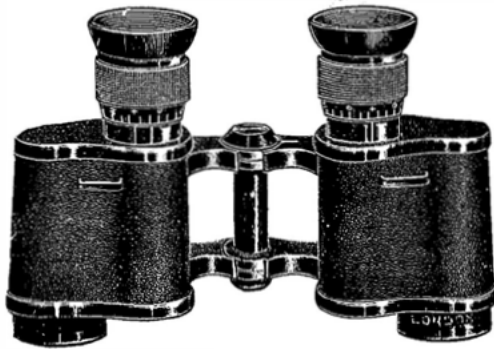


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WATSON'S PRISM BINOCULAR GLASSES

THE FINEST OBTAINABLE.

Watson's manufactured and supplied more than 30,000 of their Prism Binocular Glasses for the Great War, in addition to more than 7,000 large Telescopes for Gun Sighting, Submarine Periscopes, Fire Directors and other instruments.



The "**Lynceus**" $\times 6$ with large Object Glasses.

The "**Sunica**" the universal glass for all purposes.

Damp-proof.

Dust-proof.

Water-proof.

Stable in adjustment.

From £5 0 0

Full particulars of the above Binocular Glasses, and Portable Telescopes of every description, see Catalogue Department 6.

ASTRONOMICAL AND PORTABLE TELESCOPES



In addition to their other activities Watson's manufacture both Astronomical and Portable telescopes, suitable for all purposes. Particulars of these are published in two separate catalogues, which will be sent post free, on request. Prices from £2 5 0

A separate list of second-hand Astronomical and Portable Telescopes together with accessories is published.

W. WATSON & SONS, LTD.



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