JOURNAL

OF THE

ROYAL MICROSCOPICAL SOCIETY;

CONTAINING ITS TRANSACTIONS AND PROCEEDINGS

AND A SUMMARY OF CURRENT RESEARCHES RELATING TO

ZOOLOGY AND BOTANY

(principally Invertebrata and Cryptogamia),

MICROSCOPY, &c.

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actions of an amœba or a maggot has put us in a fair way of appreciating those of a man. If, therefore, better and clearer ideas of animal existence can be fostered in young minds by the aid of any optical appliance whatsoever, that appliance should be welcome as an aid in practical objective instruction. No less effective is this instrument in the illustration of many common facts in physical science. The range of its applicability seems indeed to be limited only by the resources, ingenuity, and ability of the lecturer."

Nelson's Student's Microscope.—Fig. 94 shows a medium-size Microscope, constructed by Messrs. Swift and Son, embodying some suggestions of Mr. E. M. Nelson with special reference to histological research with high powers where only a moderate outlay is allowable.

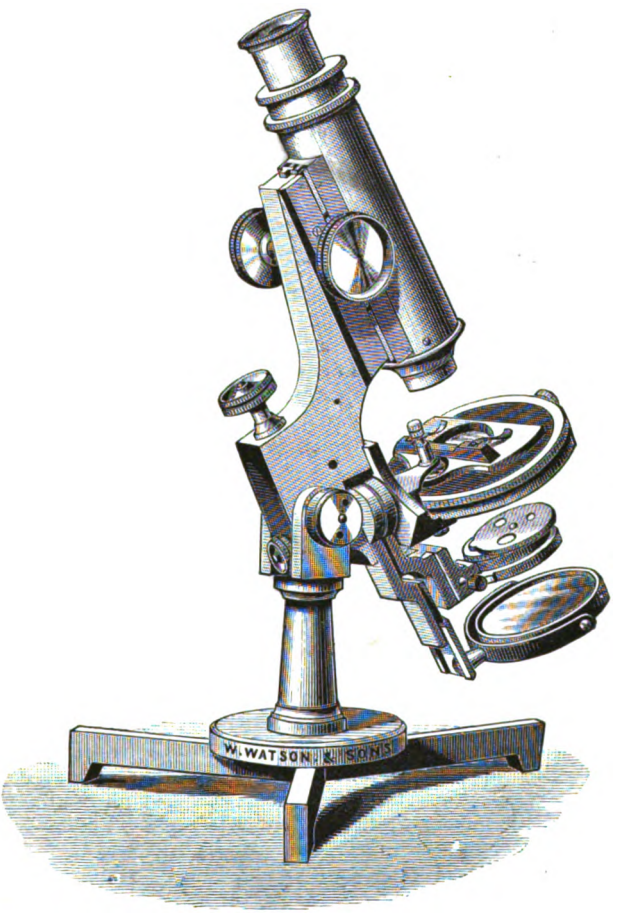
FIG. 94.

The principal point of novelty is that the front of the stage is cut away so that the position of the substage, with the diaphragms, condenser, &c., may be readily seen from above the stage, and the diaphragms rapidly changed; also permitting the finger to be placed on the upper edge of the slide for safety in focussing with high powers. Amongst other additions it may be noted that finders are applied to the stage by which the position of an object may be recorded without the use of mechanical movements, the graduations for the vertical movement being on the stage plate, and those for the lateral movement on the sliding bar carrying the object. The optical body divides in two for portability. The eye-pieces are fitted with different lengths of tubing, so that the 10-inch length is maintained with each from the diaphragm to the nose-piece, as with Powell and Lealand's Microscopes. Mr. Nelson's centering substage with lateral swinging diaphragm-carrier is also applied (for description and fig. see Vol. I., 1881, pp. 125–6).

Watson's Portable Swinging Mirror and Substage Microscope.—We have always considered Bulloch's Biological Microscope (Vol. III., 1880, p. 1078) to be one of the handiest and most practical forms of

stand made, and equally useful for biological examinations and for the more special examinations of test objects. Hitherto the instrument could only be obtained in America, which was necessarily a drawback to its use in England. Messrs. Watson have now, however, undertaken

Fig. 95.



its manufacture (with some modifications), their instrument being shown at fig. 95.

The fig. shows sufficiently the general form of the instrument: its special feature is that the substage bar and mirror bar are fixed to separate collars, so that they swing separately below and above the stage, the movement of each being independent of the

other. The feet on which the instrument stands are made to close together for portability, so that it occupies a space of 12 × 7 × 4¼ in.

The slides of the coarse adjustment fit on knife-edges in V-shape grooves, reducing friction, with perfect steadiness and smoothness, and working without loss of time.

The fine adjustment moves the whole of the body of the instrument (instead of the nose-piece only), so that there is no change of distance between the eye-piece and object-glass, and obviating the necessity of altering the collar-correction as the fine adjustment is used—the correction being found once for any given object, no further alteration is required.

The stage is glass and has universal motions, and by a screw-adjustment the friction can be increased or diminished; it is arranged to take off and be replaced by one with mechanical movements if desired.

Altogether the Microscope is likely to be one of the most useful forms for those who do not desire a stand of large size.

Walmsley's Photomicrographic Apparatus.—This simple and inexpensive form of camera (fig. 96), the design of Mr. W. H. Walmsley,* is intended to produce, by the aid of gelatine dry plates and ordinary lamplight, photomicrographs of a high order of excellence, and of almost all transparent objects requiring microscopical examination. It will answer equally well for photographing opaque bodies, if the latter be illuminated by the light of the sun reflected from a silvered mirror.

Any Microscope, monocular or binocular, having an axial joint whereby the body can be inclined to a horizontal position, may be employed. The Microscope is placed upon a base-board 4 feet in length and 9 inches in width, upon one end of which is constructed a platform for holding the camera, of such a height that the tube of the Microscope when inclined shall be precisely in the centre of the camera, which is firmly secured to the platform by a thumb-screw beneath.

The camera box, which is square to allow a lateral turning of the plates, has a removable cone front, and bellows sliding upon a frame, with an extension of three or four feet, which has been found sufficient for all ordinary work, though it could be increased to any desired extent. A simple form of clamp holds the focussing frame tightly at any point of extension. A second front is provided to replace the one carrying the cone, to which any ordinary photographic lens may be fitted, thus providing an excellent camera for copying or other studio or laboratory purposes. The focussing screen is of glass, with an exceedingly fine ground surface, mounted in a hinged frame, which is turned aside when the plate-holder is inserted. This screen is only used, however, in adjusting and centering the object, the final and delicate focussing being done on a sheet of plate glass, as presently to be described.

* Description kindly supplied by Mr. Walmsley.