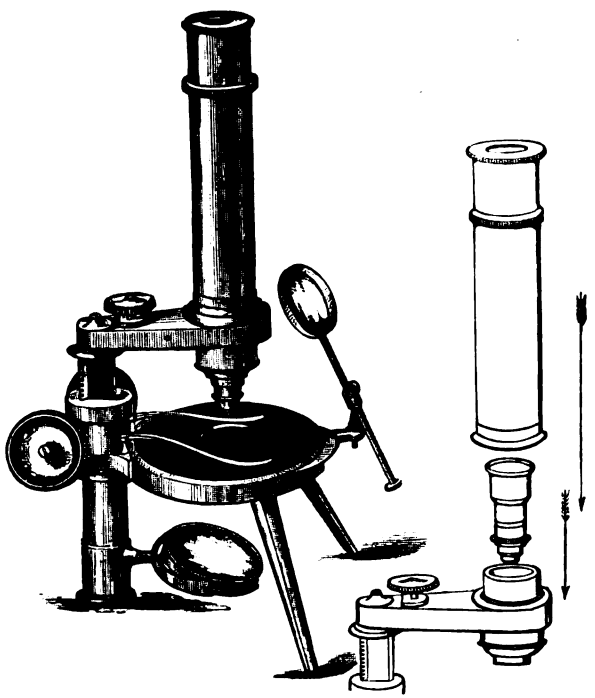
The slow-motion focussing adjustment has been remodelled so that the focussing is extremely sensitive and yet free from all rocking motion, and the bearings of the rack and pinion movements have been increased in size, and a greater smoothness of motion obtained.

The iris diaphragm can be used either attached to the achromatic condenser or placed in the stage itself immediately beneath the object and almost on a level with the upper plane of the stage, so as to give every facility for regulating the amount of light.

Professor Huxley's Dissecting Microscope.—This instrument (Fig. 56), made by Messrs. Parkes and Son, of Birmingham, was arranged by Professor Huxley, and was shown by him during his term of office as President of the Quekett Microscopical Club. It is designed specially for use either as a simple or a compound Microscope, and arranged with regard to portability for travelling.

FIG. 56.



The stage—which is furnished with rotating diaphragm, and arm for carrying a condenser—consists of a circular disk of black plate glass, with a large central aperture, and is mounted on a brass tripod stand strong enough to bear considerable pressure. The arm, carrying the powers and compound body, has a coarse rack movement, and fine screw adjustment, and can be turned aside if required.

On Professor Huxley's suggestion, that the old plan of *screwing* on

the objectives and compound body should be abolished, a new and more expeditious method has been adopted. Instead of screwing the body on to the arm, and then screwing the objective into the body, the objectives are made to slide down smoothly into the arm (as illustrated in the figure), and may thus be used as simple powers, for dissection. When the compound body is required, it may be instantaneously slid over the objective, and is thus ready for use, with a great saving of time and trouble.

Should it be desirable at any time to use objectives having the Society screw, provision is made for so doing, by the lower end of the tube which passes through the arm being cut with such a screw. A loose adapter having the standard screw is also supplied with each instrument, which will receive the objectives belonging to it; by screwing them into the adapter they may be used with another Microscope if necessary.

The following is the (verbal) description which Professor Huxley gave of the instrument:*—

"In a Microscope to be used for delicate dissections, certain qualifications were absolutely essential. In the first place, there must be perfect steadiness, the stand must be firmly and well supported, and be of sufficient strength and weight to bear the pressure put upon it without moving. Next, it must be of convenient height, so that in working the hands may get a steady support; it should fulfil these two conditions, and yet not be so large as to be clumsy. The next point was as to the lenses: they should be of such a form as to give a maximum of power, and yet at the same time afford sufficient distance between them and the object to admit of needles being moved freely to an angle of 60° with the surface of the plate, because the efficiency of the needles obviously depended upon the angle at which they could be used, and if a lens were made with a wide face it would very often interfere with the movements of the needles. Then there was another point of still greater importance: when a careful dissection had been made, it often became desirable to examine it with a much higher power than the one which had served the purpose of preparation, and provision ought to be made to enable as high a power as was desired to be brought to bear without disturbing the object, and this could only be done by placing a compound body above the simple lens.

[The President then exhibited the instrument which he had devised to meet these requirements as described above.]

"In offering the instrument for discussion, the question would arise as to the best form of lens to be employed, and he hoped to receive the opinions of the members upon this and other matters; but at present he used an ordinary low-power achromatic objective, made so as to slip into the arm without screwing; there was great convenience in thus mounting and using a simple lens. . . . Now, supposing they had made their dissection successfully, the point was how to be able to convert the instrument at once into a compound Microscope without disturbing either the lens or the object. One of his aims in life had been to get Microscope-makers to abolish screws, which he regarded altogether as abominable

* 'Journ. Quek. Micr. Club,' v. (1879) p. 144.

inventions; and in this instance the compound body had been made to slip over the outside of the socket in which the objective had been placed. This plan answered fairly well, but he thought it would be better to have it made to fit rather more easily, and to be secured by a bayonet joint, because, supposing that the power employed was not sufficient for the purpose, then inconvenience arose unless the body could be got off again with sufficient ease to ensure the object remaining undisturbed by any jerk or movement. With the improvement of the bayonet joint it would be easy to remove the body, and having taken out the first lens, and dropped in say a $\frac{1}{8}$-inch, the body would go on again without any disturbance. He had the instrument before them made upon that pattern, to see how the thing would work; he had used it for the past six or eight months incessantly, and he could certainly say that for his requirements it was the best thing he had seen, and he believed that with the little addition of a bayonet joint it would be as nearly perfect as any instrument of the kind could well be. He thought that all persons who had been occupied in making minute dissections would see that it had value, and met all the requirements of the most delicate work. He hoped that the members would examine and criticize it, and make any suggestions that occurred to them for its further improvement, for it was becoming of very great importance to examine thin sections and minute portions of dissections without subjecting them to any such disturbance as to cause the slightest alteration, and it was equally important to be able to bring to bear upon them under such conditions the highest powers that might be needed."

Nachet's Chemical Microscope.*—In this Microscope (shown in Fig. 57) the objective is placed beneath the object on a brass box containing a mirror silvered on its upper surface. To this box is screwed the body containing the eye-piece and a sliding tube which is used as a coarse adjustment. The silvered surface of the mirror is entirely protected from the action of the air, as the two openings of the box are furnished with parallel glass plates. The focal adjustment is made by raising the objective and by the micrometric screw V which moves the stage. On the latter is a circular glass cell C, the bottom of which is pierced with a hole of 18 mm., closed by thin cover-glass well luted with Canada balsam or with silicate of potash. The object to be examined is placed on the thin glass. An arm B carries a mirror which reflects light from above upon the object in the cell. The latter is provided with two glass taps R R′, and is covered by a disk of plane glass hermetically sealed by a little glycerine or grease placed around the edge of the cell. Three small brass uprights keep the cell and its cover in place and immovable. The instrument has a new arrangement for seeing the different parts of the preparation. The body, and consequently the objective, is moved by means of two transverse screws O and T. The plate which supports the box is furnished with two transverse divisions in connection with the movement of the screws, so as to have in effect a finder (the divisions are not represented in the figure).

* Translated (with slight alterations) from note furnished by M. Nachet.