XXIII. — *On a Lever Movement to the Stage of the Microscope.*

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THE lever movement to the stage of the microscope having been very recently under the consideration of the Society, I am induced to lay before you a description of the plan I have used during the last three years, and find it much more convenient than the rack and pinion, or the screw.

It does not at all depend upon a particular construction of the guides to the stage, but only to the motion of its upper plate, or the one upon which the object to be viewed is placed; therefore to a stage with three, or to one with two plates, this plan is equally applicable.

It consists of a lever D, E (Plate xx.), to the shorter arm of which the ball B is firmly screwed, and moves in a socket formed by the upper plate of the stage A, and the cap C, which is a brass plate secured by two screws. This lever passes through the perforated ball, F, which moves in a socket formed by the arm G, which is attached to some immoveable part of the microscope, and the cap H, formed and secured as C.

The lever I have used is about 5 inches long, and has its longer arm $E = 3$, and the shorter, $D = 1$, when in the position represented in fig. 1, (Plate xx.). But this proportion, when in use, is not constant, as will be seen by fig. 2; for the longer arm of the lever having been elevated and the shorter one depressed, and the ball B having travelled in a straight line to b , instead of a portion of a circle, it will be found that the shorter arm has increased by a quantity equal to the space between $1f$ and $2f$, and for this reason the ball F is perforated to enable that part of the lever to move easily, though without shake.

As the end of the lever to which the hand is applied moves in all cases in an opposite direction to the ball B; and as the compound microscope inverts the image of the object viewed; it follows that the object will appear to move in the direction of the hand: and as for each position of the ball B, there is but one in which the other end of the lever can be placed, if a certain portion of the object is seen at any time, and it is required to bring the same part into the field again, this will be done by placing the hand in the original position.

I have stated before that this movement is applicable to any construction of stage-guides ; I will now say a few words respecting its application to the stage with dove-tail slides having plates moving vertically and horizontally.

If applied to this kind of stage, it is as well to have the upper plate move vertically, for in that case the longer arm of the lever and its knob have to balance that plate only. But should the middle or second plate move vertically, then the lever must be sufficiently heavy to support the two plates when the stage is in the position represented in fig. 1.

Fig. 3 represents this mode of movement applied to a three-plate stage.

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