## BECK'S IMPROVED LARGE BEST MICROCOPE-STAND.

The Improved Large Best Microscope-stand has a tripod A, fer its base, upon which is placed a revolving fitting (B), graduated to degrees, by which means the microscope can be turned round without its being lifted from the table, and the amount of such rotation registered; upon this fitting two pillars are firmly fixed, and between them the limb (C) can be elevated or depressed to any angle, and tightened in its position by the lever (D). The limb carries at one end the body (E) (binocular or monocular), with eye-pieces and object-glasses; in its centre the compound stage (F), beneath which is the circular-plate, sliding on a dove-tailed fitting, and moved up and down by the lever (Z), and carrying the supplementary body or substage (G); and at the lower end a triangular bar carrying the mirror (H). Each of these parts requires a separate description.

THE BINOCULAR BODY.—The binocular body consists of two tubes, the one fitted in the optical axis of the microsocope, and the other oblique. At their lower end and immediately above the object-glass there is an opening, into which a small brass box or fitting (I) slides; this box holds a prism so constructed that when slid in it intercepts half the rays from the objectglass, diverts them from their direct course, and reflects them into the additional or oblique tube. To the prism-box is attacked a spring-catch, which, when pressed in, permits of the removal of the prism-box; but it is only needed for cleaning, as, when the box is drawn back to the distance allowed by this spring, the prism in no way interferes with the field of view, and all the rays pass up the direct body, and the microscope is converted into a monocular one.

The upper or eye-piece ends of the tubes are fitted with racks and piulon for varying the distances between the two eye-pieces, to suil the differences between the eyes of various persons; and arrangements are made for racking out one tube more than the other, to suit irregularities or inequalities between the eyes of the observer.

This body is moved up and down with a quick movement by means of the milled heads (K), and with a very delicate and fine adjustment by the milled head (L). This milled head works against a lever, which moves a slide independent of the rackmovement, and gives an adjustment at once certain and decided.

THE STAGE.—The compound stage is of an entirely new construction: the object is most frequently merely placed upon it, but, if necessary, it can be clamped by carefully bringing down the spring-piece (M), the ledge will alide up or down, and the object may be pushed sideways; this arrangement forms the coarse adjustment. Finer movements in vertical and horizontal directions are effected by means of two milled heads (N and O), the screws attached to which are kept up to their work by opposing springs, so as to avoid all strain or loss of time. The whole stage revolves in a circular ring by the mailled head (P), or this can be drawn sut, and then it turns rapidly by merely applying the fingers to the two ivory studs (Q, Q), fastened on the top plate, which is divided into degrees to register the amount of revolution. The stage is attached to the limb on a pivot, and can be rotated te any angle, which angle is recorded on the divided plate (R), or can be turned completely over, so that the object can be viewed by light of any obliquity without any interference from the thickness of the stage.

any interference from the thickness of the stage. Beneath and attached to the stage is an iris diaphragm (S), which can be altogether removed, as shown in the illustration, from its dove-tailed fitting, so as not to interfere during the rotation of the stage. The variations in the aperture of this diaphragm are made by a pinion working into a racked arc and adjusted by the milled head (T)

THE APPARATUS BARS.—Beneath the stage are two triangular bars (U, V), the one revolving round and the other rigid in the optical axis of the instrument. On the former the substage (G), carrying all the apparatus required for illumination and polarisation, fits, and is racked up and down by the milled head (W); the mirror also, if desired, slides on the same bar; the revolving motion to this bar is given by the milled head (X), and the amount of angular movement is recorded on the circle (Y), whilst the whole of this part of the stand is raised and lowered concentric with the optical axis of the instrument by the lever (Z), and the amount of such elevation or depression registered on a scale attached to the limb. This bar can be carried round and above the stage, and be thus used for opaque illumination.

The lower triangle bar (V), or a right angle prism, when the illumination is required to be concentric with the optical axis of the instrument, and independent of the movement of other illuminating apparatus.

THE MIRBOR.—The mirror-box contains two mirrors, one flat and the other concave; it swings in a rotating semicircle attached to a lengthening bar, which enables it to be turned from one side to the other, and revolves on a circular fitting for giving greater facilities in regulating the direction of the beam of light reflected, the whole sliding on either of the triangle bars previously referred to, and made to reverse in the socket so as to bring the center of the mirror concentric with the axis of the microsoccope in either case.

THE SUBSTAGE .--- As the mirror alone is insufficient for many kinds of illumination, some provision has to be made for holding various pieces of apparatus between the object and the mirror. For this purpose a supplementary body, or substage is mounted perfectly true with the body, and is moved up and down in its fitting by rack and pinion connected with the milled heads. This substage, to which reference has already been made, is now regarded as one of the most important parts of the Achromatic Microscope; in it all the varied appliances for modifying the character and direction of the light are fitted. But a few years since it was considered sufficient for this part of the stand to be constructed so as to move up and down perfectly coincident with the optical axis of the instrument, and for that purpose it was racked in a grove planed out on the same limb as that on the upper end of which the optical portions were carried. But lately mircroscopists have shown the desirability of affording every facility for lateral angular adjustments; and this has led to the mircroscopists have shown the desirability of affording to the substage being attached to an arc (b) working in the circoular plate (Y), and moved by a rack and pinion (X), whilst the amount of such angular movement is recorded on the upper sur-face of the plate (Y). Having once fixed the the angular direc-tion of the light, the focusing of it depends upon the lever (Z), which moves the circle up and down, and with it the arm carrying the illustration of the light of the intervention of the light of the super surthe illuminating apparatus, in the optical axis of the instrument. So long ago as 1854 Mr. Grubb, of Dublin, called attention to the advantage of mounting the illuminating apparatus on a re-volving arm or arc, which he thus describes in his provisional specification for improvements in microscopes, No. 1,477, 5th July, 1854 :-- "My third improvement consists in the addition of a graduated sectorial object 'in situ,' on which either the aforesaid prism or other suitable illuminator is made to slide, thereby producing every kind of illumination required for microscopic examination, and also the means of registering or anniving any definite angle of illumination at pleasure." With applying any definite angle of illumination at pleasure." Without alight modification, this is the plan adopted in this stand.

A BED-BUG TEAP.—Edison may be a chieftain among inventors, but if he had lived 3,000 years before Christmas he never would have dropped on such a family blessing as our ming friend, Tom Orton, did when he accidentally left his oribbage board in the blankets at the foot of his bunk. Tom didn't have bugs, but his bed did, and had 'em bad. After the crip-board had been in the bed all night his eagle eye made the discovery that most of the holes had been located by enterprising bugs, and he instantly "tumbled" to the idea. False head-boards, footboards, and side-boards, bored innumerable gimlet holes were provided, and every morning the boards were taken out and the locators scalded. The mortality among the bugs had been fearful since the invention, and the boys dewn that way, as they roll into their blankets, and drop peacefully into pleasant dreams, pray for blessings to fall on the inventor of the "Orton Thousand-Holed Crip-Board Bed-Bug Destroyer," which has brought peace, rest and comfort to the sleepers of the North Fork.—Plumvis National.

MANUFACTURE OF LAGER BEER IN SMALL QUANTITIES. —The following recipe is said to make an excellent beer for home use: To make 5 gallons of beer, take somewhat more than that quantity of soft water, suspend in the vessel containing it a bag with about two ounces of hops, and boil for about half an hour; then add about 3 pounds of ground malt, or, if preferred, a quart of thick sugar syrup (or of molasses); allow the whole to boil up several times, then pour the decoction in a tub or vat. As soon as it has become say luke-warm, add to it about a half pint of good brewer's yeast, and allow the whole to remain in a cool place to ferment. At the expiration of six to eight days, it will have become quite clear, and may then be bottled. This beverage may be made stronger or weaker, or more or less bitter, by varying the above proportions; and, when prepared according to this recipe, is said to make a refreshing and pleasant drink, which will keep very well in a good cellar.