III.—*Note on Dr. Barnard's Remarks on "The Examination of Nobert's Nineteenth Band."* By J. J. WOODWARD, Assistant-Surgeon, U. S. Army.

My own paper "On the Use of the Nobert's Plate"* and Dr. Barnard's reply,† state so fully the arguments in favour of a complete count of the band on the one hand (my method), and on the other, of a count of a measured portion of the band only, say twenty to thirty lines (Dr. Barnard's method), that I think the question may now advantageously be left by both of us in the hands of those who are competent to judge of the comparative certainty and accuracy of the two methods.

Nevertheless I think justice to myself requires that I should call attention to the contradictory interpretation which my distinguished friend has been led to give to the same series of observations in consequence of what I must regard as his misplaced confidence in a method which I believe to be deficient in the accuracy required for this purpose.

Dr. Barnard's original observations were related by him in a private letter to Mr. Stodder, dated January 29, 1868, and Mr. Stodder published them in a note to his paper "On Nobert's Test-plate and Modern Microscopes" in the 'American Naturalist,' vol. ii. p. 93.‡ Mr. Stodder tells us that Dr. Barnard resolved the nineteenth band with a Spencer's $\frac{1}{12}$ th and a Tolles's $\frac{1}{4}$ th, *both dry lenses*. With the former objective he made a series of counts of a measured fraction of the band, which gave by reduction a series of estimates of the number of lines to the English inch, 106,226 lines being the smallest, and 115,474 lines being the largest estimate.

At the time Dr. Barnard made these observations the subject of the spurious lines so readily developed on the plate had not received due consideration. I had myself about the same time supposed that I had resolved the nineteenth band with a dry Wales's $\frac{1}{4}$ th, but subsequently convinced myself that I had been deceived by the spurious lines.

The observations of Dr. Barnard recounted by Mr. Stodder as well as some made by Mr. Stodder himself with a Tolles's immersion $\frac{1}{4}$ th, reported in the same paper, became therefore the subject of a private correspondence, and several conversations between Dr. Barnard and myself, and that gentleman became so thoroughly convinced that he also had been misled by spurious lines, that in a public lecture delivered before the American Institute in New York city, November 25, 1868, he announced his conviction that the

* This Journal, July, 1871, p. 26.

† Ibid., October, 1871, p. 194.

‡ Reprinted in the 'Quarterly Journal of Microscopical Science,' July, 1868.

finest lines of the nineteenth band plate "have never been as yet fairly resolved." *

In the following spring, however, having received an immersion $\frac{1}{10}$ th from Messrs. Powell and Lealand, I was so fortunate as to effect undoubted resolution of the refractory bands, and to furnish a count of the number of lines; and now Dr. Barnard, as his recent paper shows, *reconsiders* his own judgment of his own work, and claims to have effected true resolution with the *dry* Spencer's $\frac{1}{12}$ th, though he writes me he still admits the lines shown by the dry $\frac{1}{8}$ th to have been spurious. I confess I am not convinced by his present reasoning that the judgment deliberately announced in his public lecture of November 25, 1868, was erroneous, and must continue to believe that a method which has permitted so careful and conscientious an observer to contradict his own conclusions in this manner, ought not to be preferred to the more accurate and absolute criterion of resolution which I have proposed for the higher bands of the plate.

IV.—*A New Erecting Arrangement, especially designed for Use with Binocular Microscopes.* By R. H. WARD, M.A., M.D.,
Professor of Botany and Microscopy in Rensselaer Polytechnic Institute.

For dissecting and other manipulations under magnifying powers, the simple microscope is awkward and unsatisfactory, and has been made to serve as a binocular only with very low powers; but the superb field of the compound microscope has been comparatively little used for these purposes, because few persons can work to advantage under an inverting arrangement; the erectors usually furnished are not good, and the use, otherwise satisfactory, of a good objective as an erector has not as yet afforded the advantage of binocular vision. The simple expedient now proposed is designed to increase the usefulness of the stereoscopic binoculars in ordinary use by rendering them easily available for purposes which require an erect image.

Last summer, the writer proposed, at the Indianapolis Meeting of the American Association, to place, for certain purposes, an erecting objective below instead of above the regular objective of the microscope. Then, of course, the regular objective becomes the erector, and the accessory one below acts as the objective. This simple expedient, applied to Wenham's and other non-erecting binoculars, leaves little to be desired for the purposes of a dissecting microscope. The lenses of a $1\frac{1}{2}$ or 2 inch objective (preferably a solid or single-combination one) may be packed or screwed into

* 'Annual Report of the American Institute of the City of New York for the year 1868,' No. IX., page 43.