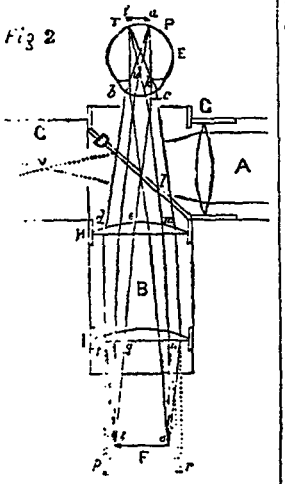
lens G, at the points N R they are refracted and emerge from the lens convergingly towards a focus V in the tube C, but at O and S they are intercepted by the plate glass D, a portion of the rays are reflected by its polished surface in the direction E, and rays not reflected or absorbed are transmitted and pass to form a focus at V, the principal focal distance of the lens G, and again diverge in the direction W. X.

The rays reflected from the surface of the plate glass form a focus at U (which is also the focal centre of the eye E) at the same distance in front of the plate glass D, as V is behind it, these rays at U again diverge and illuminate a portion of the fundus at T. P.

Reflection. — Let E (fig. 2) represent the same eye illuminated as just described, D the plate glass, and H I the lenses in the camera tube. Rays from any portion of the illuminated fundus as *a*, are reflected from the fundus and emerge from the cornea at *b c*, the width of the dilated pupil, and proceed to the plate glass D (parallel rays of light emerging from an eye having its accommodation paralyzed are parallel or very nearly so) where some of its rays will be reflected through the lens G in the direction of the source of illumination, but other rays proceed to *d*, *e*, where they are incident on the lens H by which they are refracted, and they would proceed to a focus at the principal focal distance of the lens H, viz.: at 5 inches, but they are again intercepted at *f*, *g*, by the lens I, which refracts them to an earlier focus at *h*. In the same way rays from *i*, on E's retina, proceed from the cornea parallel to the axis *i*, *k*, *m*, and are also refracted by the lens H and I, and are brought to a focus at *o*. In like manner all points intermediate between *i* and *a*, on E's retina, are reflected from the fundus and refracted by the lenses forming an inverted image of *i*, *a*, at *o*, *h* which is received upon the ground glass placed at F.

Fig 2



Application—Advantages.

The advantages I claim for this intrument are:—

1*st*. The simplicity of its construction, taking into consideration its twofold purpose, viz.; as an ophthalmoscope, and as a photographing instrument. My friend Dr. Noyes, of the N. Y. Eye Infirmary, constructed an instrument for photographing the fundus oculi, and which was I believe to a considerable extent successful, but its construction was too complicated and the instrument too expensive to be generally adopted. Dr. Noyes' instrument is constructed somewhat upon the principle of the binocular microscope. Any good optician can construct this instrument. The one I exhibited to the Institute was made by Charles Potter, of King street, Toronto.

2*nd*. The limited experience necessary in order to use it successfully; the ordinary ophthalmoscope requiring months of practice before it can be used satisfactorily.

3*rd*. Being able to see the aerial image free from reflections from the object lens, which reflections are serious obstacles to beginners.

4*th*. Being able to receive the image, either of a healthy or diseased fundus, upon a screen of ground glass which can be seen by a number of persons at the same time, and could be taken advantage of by gentlemen lecturing upon the physiology of the eye, or upon the pathology of its deep structures.

5*th*. With it, artists will be enabled to make coloured representations of the fundus, which, with the instruments now in use, has never yet been effected; thus, Mr. Hulke in his Treatise on the Ophthalmoscope, and Jabez Hogg in the preface to his "Manuel of Ophthalmoscopic Surgery" (June 1863,) apologizing for defects in their coloured representations, state that it is impossible to procure the services of artists having the requisite knowledge of the use of the ophthalmoscope.

6*th*. Rendering it comparatively easy to photograph the reflection from the posterior internal surface of the eye.

I cannot conclude without expressing the hope that this instrument will contribute something towards awakening more of an interest in opthalmoscopic science, as the opthalmoscope is undoubtedly as essential in investigating diseases of the eye, as the stethescope in diagnosing affections of the heart and lungs: and I trust its use will aid in banishing from ophthalmic nomenclature the indefinite term of amaurosis, where, as Walther observed, "the patient and physician are equally blind."

PURPURA HÆMORRHAGICA.

We notice in a late number of the London Medical Times, an article from the pen of Dr. Grant of Ottawa, on the prevalence of an aggravated form of purpura among the lumbermen in his part of the country, styled by them "black leg." He attributes it in a great measure to the excessive use of nitrate of potash in the preservation of the meat on which they subsist. And says that the same effect was produced some twenty-five or thirty years since from the same cause, and that it ceased on a more moderate employment of this salt; and that a long series of years has correctly established the truth of this observation. We quote the following description of it from his article:—

In one shanty twenty-five men out of thirty-six were attacked with this same disease, and, from ascertained facts, the great proportion of the cases were developed as follows:—

Slight pains in the extremities, particularly about the ankle-joints and posterior parts of the legs. After a few days in severe cases, the pain is liable to extend to the arms and shoulder-joints. The integument of the legs is first observed to change colour, passing from a somewhat yellow to a deep venous hue, in large patches, almost approaching to a black (hence the term). The legs and the arms are liable to swell, particularly the former. Frequently, two or three weeks before any constant pain is complained of, or change of colour takes place, the limbs move sluggishly in response to the will, and considerable soreness is experienced upon pressure. Abrasion of the integument is followed by a sero-sanguinolent discharge; and, if