To secure a sharp image of the rays crossing at the wider angle, the focusing screen must be placed exactly at the crossing point, while on those at the much smaller angle it may be moved for a certain distance to and fro without visibly affecting the sharpness. In other words, objects both in front and behind that which had been specially focused appear sufficiently sharp, and thus "depth of focus" is obtained.

Although the securing of depth of focus be the main object of the stop in a compound lens, it also tends to flatten the field. Except in the case of the new "Anastigmat," it has been hitherto impossible to altogether eliminate spherical aberration from even the best type of compound lens, and although the residue is too small to affect portraiture or landscape work, it is inimical to the successful copying of maps and plans, and although the depth of focus is not needed there, the small stop is absolutely essential to secure perfect marginal definition.

Of course, it goes without saying, that the smaller the stop the less will be the light that is transmitted to the plate, and consequently the longer will be the exposure, but the amateur, and the professional also, as he is not unfrequently in blissful ignorance of the nature and properties of his lens, should remember that the size of the stop *per se* has no meaning, and only becomes intelligible when its relation to the focal length of the lens is known.

Stops, therefore, should always be thought of and spoken of in that relation, viz., as *f*/x, x being the proportion the aperture bears to the focus of the lens. Until a few years ago, each maker made the apertures of his stops according to his own fancy, although there was a kind of general understanding that each smaller stop required twice the exposure of its next larger neighbor, but modern opticians generally adopt what is known as the U. S., or universal system.

The largest working aperture of the average portrait lens is one-fourth of its focal length, and the stop, consequently, is marked *f*/4. The U. S. takes that as the unit, and also marks it No. 1. A little calculation shows that if the aperture be reduced to 1½-fifths of the focal length, it will admit just half of the light admitted by the one-fourth, and it is marked *f*/5-6, with the U. S. No. 2, and so on through as many stops as can possibly be required. Thus: *f*/8, No. 4; *f*/11-3, No. 8; *f*/16, No. 16; *f*/22-6, No. 32; *f*/32, No. 64; *f*/45-2, No. 128.

In this way, not only is the relation which each stop bears to the focal length of the lens shown, but also, the exposure required with any one stop on any particular plate being known, the time with any of the others is seen at a glance. For example, if it is known that *f*/22 needs two seconds, *f*/32 will need four, and *f*/16 only one; or if *f*/4 requires one second, then the U. S. numbers behind each stop give the respective number of seconds needed.

Amateurs whose lenses are not so marked could hardly take the trouble to alter the openings of their stops, but they should certainly ascertain the *f* value of each of them, so as to be able to communicate intelligibly with their brethren. The first step is, of course, to ascertain the equivalent focus of the lens. If a single one, all that is required is to focus carefully some distant object, and measure the distance between the back of the lens and the focusing screen. With a compound lens the operation is more complicated. There are various methods by which