THE OPTICAL DEVECTS OF THE EYE.

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re sometimes called

d, depends upon a splained further on. lens at a distance of out 20 feet from an the lens, upon the , and trees or buildheld at a greater or of the lens, the ine distance therefore the sharpest pic-

in, say 5 feet of the incipal focal distance a change in the indings, trees, &c. but f, however, we move is, two inches farther ash but scarcely any ent is an illustration he front of a conven thus, when an object 10 inch convex lens d the lens ; when 30 le the length of the he focus behind the behind the lens will oaches the principal more rapidly; thus when at 11, the image ever we bring the ob t its principal focu s the rays after pas

form all these experyou become familis experiments can b object the flame of From the above we can easily understand the principle, ' ', that the less divergent the rays of a pencil (that is, the nearer they approach parallel rays,) incident or falling upon a convex lens, the nearer will the focus of the convergent pencil be to the principal focus of the lens. 2nd. The more divergent the incident pencil, the less convergent (the more nearly parallel) will be the refracted pencil, and the more distant will its focus be from the principal focus of the lens.

Questions of the following nature very often arise in optics, viz., the length of the principal focus of a convex lens being given, and the distance a certain object is in front of it; —to ind how far behind the lens will be the inverted image of the object. Or to express it more technically, the length of the principal focus of a convex lens being given and the length of the divergent incident pencil, to find the length of the focus of convergent refracted pencil. Thus: Suppose you had the following question: A 10 inch lens is 60 inches from an object; how far behind the lens will be the inverted image ?

This could be solved immediately, by actual trial, and measurement, but this is not always practical.

The rule given in some text books on optics is as follows: multiply the length of the divergent incident vencil, that is, the distance the object is from the lens, by the focal length of the lens, and divide by the difference; thus: $60 \times 10 = 500$, 60 - 10 = 50, 600 divided by 50 = 12; or $\frac{60 \times 10}{60 - 10} = \frac{600}{50} = 12 =$ the distance behind the lens.

There is another property of convex lenses which I must not omit to mention; namely, what is called it magnifying power.

When a convex lens 1_{12} placed between the eye and an object, the object being at a less distance from the lens than its principle focus, the object will appear enlarged or magnified. The shorter the focus of the lens, the greater is its magnifying power. Thus, a 4 inch lens has a greater magnifying power than an 8 inch lens; a 2 inch lens greater than a 4, and a 1 inch greater than a 2 inch lens. The 1 inch lens has, in fact, double the magnifying power of a 2 inch lens; a 2, double that of 4 inch; a 4 inch, double that of an 8 inch, &c.

"he "power" of a lens is therefore inversely proportional to its focal length. For this reason a different form is used in expressing the "power" or strength of a lens. A 1 inch lens is taken as unity,

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