

ABNORMAL REFRACTION AND EYE-STRAIN.

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The emmetropic, that is, the normal eye, produces a distinct image of external objects on the retina, particularly that portion of it situated at the posterior extremity of the visual axis, *i.e.*, the yellow spot region.

The formation of the image is accomplished by the cornea, crystalline lens, aqueous and vitreous humors. The cornea is the principal lens when the eye is at rest, as it separates two media with the greatest difference in density, and therefore has a higher refractory power than the crystalline lens. But the crystalline lens possesses the important function of accommodation, and approaches during the maximum of this function to the refractive power of the cornea. In order to form a distinct retinal image it is necessary that the curvature of the meridians should be symmetrical. Any departure from this produces variations in their refractive power.

The emmetropic eye has a range of vision from infinity to its near point. No glass improves distant vision, and spectacles are not required for reading until the age of forty-five or fifty years is reached.

Emmetropia, in the strict sense of the term, is the condition midway between hyperopia and myopia; and its title of normal refraction is denied, as it is not common to find people absolutely emmetropic.

One of the most important points in the treatment of eye diseases is to restore the eye to a condition of emmetropia by suitable glasses.

Errors of refraction lie at the root of 50 per cent. or more of all diseases of the eye.

Ametropia is any departure from emmetropia or perfect focussing. The principal focus is not a point, nor does it lie in the retina.

Ametropia is of three kinds. In the first class the eye is too weak or the axis is too short, so that the principal focus of the eye falls beyond, *i.e.*, behind the retina. This is termed hyperopia or far-sightedness.

In the second class, the refractive power of the eye is too strong or the axis of the eye is too long, causing the principal focus to fall in front of the retina. This is termed myopia, or near-sightedness.