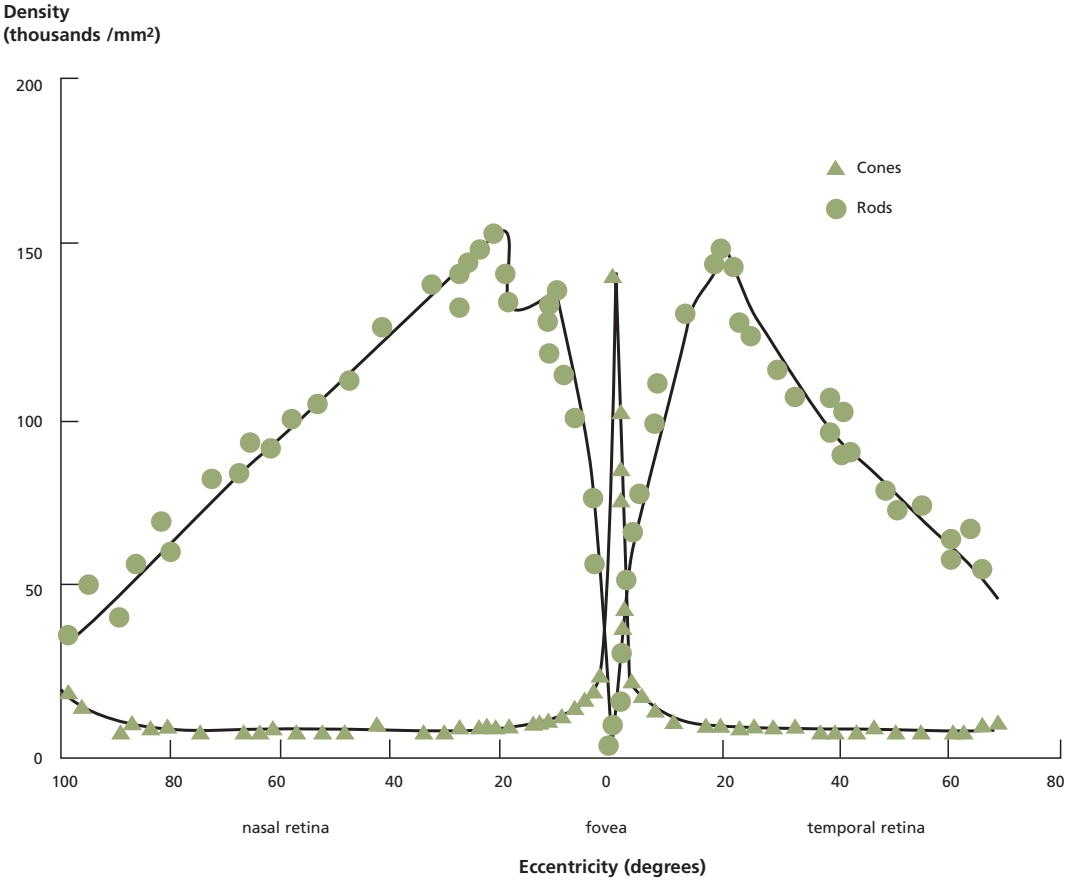

Figure 2.7 The distribution of rod and cone photoreceptors across the retina. The 0 degree indicates the position of the fovea.

The three cone types are also not distributed equally across the retina. The L- and M-cones are concentrated in the fovea, their density declining gradually with increasing eccentricity. The S-cones are largely absent from the fovea; reach a maximum concentration just outside the fovea and then decline gradually in density with increasing eccentricity.

Over the whole retina there are approximately 120 million rods and 8 million cones. The fact that there are many more rod than cone photoreceptors should not be taken to indicate that human vision is dominated by the rods. It is the fovea that allows resolution of detail and other fine discriminations and the fovea is entirely inhabited by cones. There are three other anatomical features that emphasise the importance of the fovea. The first is the absence of blood vessels. The second is that the collector and ganglion layers of the retina are pulled away over the fovea. The third is the fact that the outer limb of the cone photoreceptor can act as a waveguide, making cones most sensitive to light rays passing through the centre of the lens. This last characteristic, known as the Stiles-Crawford effect, compensates to some extent for the poor quality of the eye's optics by making the fovea less sensitive to light passing through the edge of the lens or scattered in the optic media. The fovea is populated only with cones. Rod photoreceptors, which dominate the population of the rest of the retina, do not show a Stiles-Crawford effect.