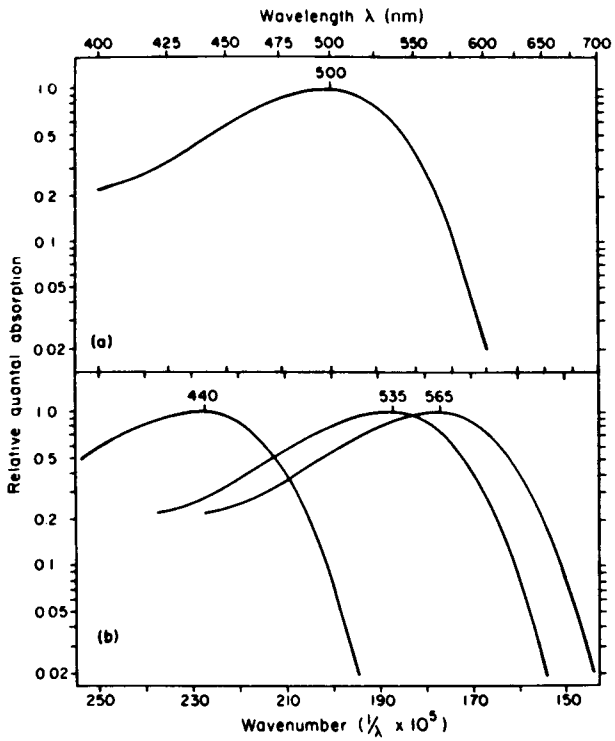

Figure 3.17 A representative set of absorption spectra for rhodopsin, the rod photopigment (*a*), and the cone photopigments (*b*). [*From I. Abramov and J. Gordon, "Vision," in E. C. Carterette and M. P. Friedman (eds.), "Handbook of Perception: Biology of Perceptual Systems," vol. 3, Academic, New York, 1974, pp. 327–406.*]

In one particular location of the retina there is some additional spectral processing. Observe in Figure 3.2 that a region of about 6° to 10° centered on the fovea has been labeled "macula lutea." This is a yellow screening pigment, which has only been found in primates and which tends to filter out light in the blue-violet portion of the spectrum. This filtering effect, in addition to the filtering action at short wavelengths of the lens in the optical system (see Figure 3.11) and the absence in the central ($\frac{1}{2}^\circ$) region of the fovea of cones with pigments sensitive to blue, significantly attenuates the contribution to human vision at these high frequencies.

Summarizing this section, we may say that the rod and cone photoreceptors in the retina are the transducing elements of the human visual system. They transform the focused image on the retina into an electrical energy signal according to the principles to be described in Section 3.4.

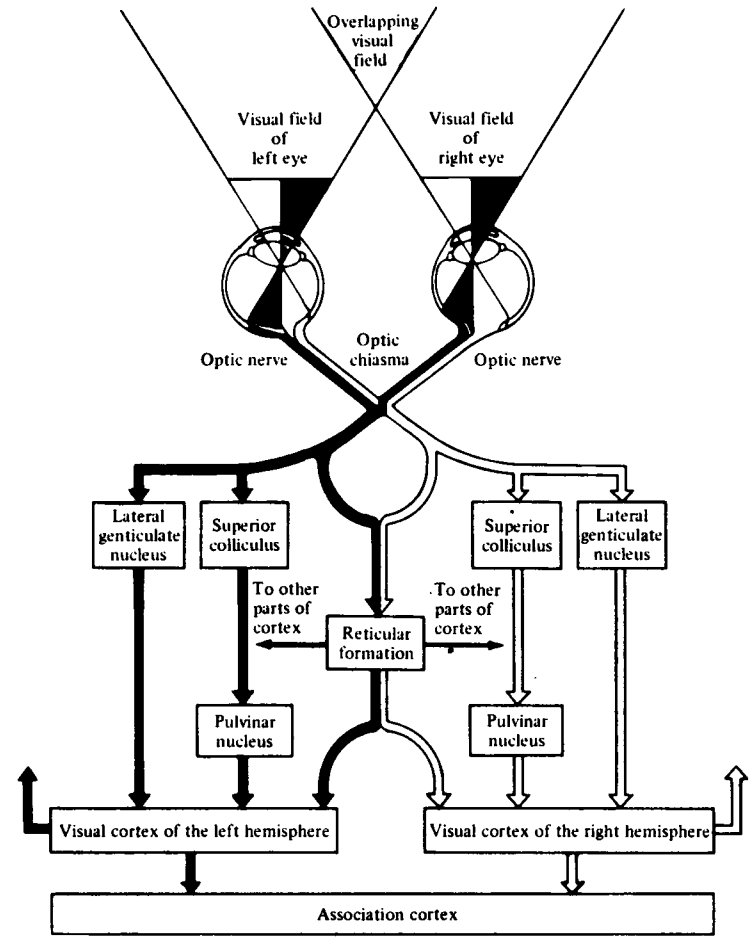

Figure 3.18 Block diagram showing the major known interconnections in the visual pathway.

3.4 THE VISUAL PATHWAY

In Section 3.3 we referred to a stack of five layers of cells in the retina: the photoreceptors responsible for image transduction and the bipolar, horizontal, amacrine, and ganglion cells, which are already involved in some low-level processing. This section will attempt to delineate the major visual pathways involving these cells, as well as their connections. In doing so it will become clear that visual processing in living organisms is constituted as a hierarchy of analyses. It goes without saying that this will be a necessarily incomplete