3.3: Spectacle Lenses

The less time I spend thinking about eyes the better. However, for a number of different reasons it may happen that, when parallel light enters the relaxed eye, it may be brought to a focus *before* the retina. In effect the lens, or the cornea, of the eye is too strong, or perhaps the eyeball is too deep. It is easy to see objects that are close up, but light from more distant objects is brought to a focus too soon. The eye is said to be myopic or *shortsighted* or *near-sighted*. All that is needed is a weak diverging lens in front of the eye.

Perhaps when parallel light enters the eye, it is brought to a focus *behind* the retina. Maybe the lens or the cornea is too weak, or the eyeball isn't deep enough. By contracting the ciliary muscles you can bring parallel light to a focus, and may even be able to focus on distant objects. But you just cannot focus on nearby objects. Your near point is much more distant than the standard 25 cm. In that case the eye is *hypermetropic*, or *long-sighted* or *far-sighted*. It is easily corrected with a weak converging lens in front of the eye. It is normal for the near point to recede with age, and weak convex glasses are required. Such glasses to not "magnify"; they merely enable you to focus on objects that are closer than your near point – just as a so-called "magnifying glass" does. If you are hypermetropic, looking at large print won't help! Large print won't come to a focus any more than small print will.

Other eye defects, such as astigmatism, aren't so easily corrected with a simple lens, and require specially shaped (and expensive!) lenses.