REGULATING DEFECTIVE SIGHT BY EDUCATING THE EYE

NO less than 12,374 of 106,392 recent applicants for enlistment in the United States Navy and Marine Corps were refused for defective eyesight. Trouble with vision, in fact, has become a world-wide plague, and until recently it has been the despair of the medical profession. Errors of refraction can be compensated and relieved, of course, by the use of glasses; but glasses do not cure them. Spectacles are poor substitutes for natural sight, and the conditions that they are designed to alleviate are ominous of evil. The near-sighted, far-sighted, or astigmatic eye is disposed to all sorts of ocular disease. So we are assured by Mary Dudderidge, who writes in *The Scientific American* on "New Light Upon Our Eyes." The "new light" is that shed by a New York oculist, who has devised methods of treatment intended to relieve errors of vision without the use of corrective lenses. It is not a little surprizing, writes Miss Dudderidge, to find an eye specialist who has been treating errors of refraction without glasses for thirty years, and whose experiments, it is claimed, invalidate most of the theories on which the present practise of ophthalmology is based. We read in substance:

Dr. William H. Bates, of New York, is already well known as the discoverer of the properties of adrenalin, an extract from the suprarenal gland of the sheep, which is now used all over the world as an astringent and hemostatic; but his remarkable experiments on the eyes of animals and the startling conclusions that he has drawn from them have, as yet, attracted comparatively little attention.

Defects of vision have been found to be associated with deviations from the normal in the shape of the eyeball, which ought to be a perfect sphere; and such deformations are always supposed to be permanent. In near-sight the sphere is elongated so that it can be focused accurately only on near objects. In far-sight the eyeball is too short, and the light rays are focused behind the retina. In astigmatism the eyeball becomes lopsided, the deviation from the normal curvature not having been uniform.

By the manipulation of the exterior muscles of the eyeball, the function of which has long been a matter of dispute, he was able to make the eyes of fishes, rabbits, and other animals near-sighted, far-sighted, or astigmatic at will. He therefore concluded that it was by the abnormal action of these muscles, rather than through the agency of the crystalline lens—as generally believed—that similar conditions were produced in the human eye, a view which was confirmed by observations on the human eye itself.

In a series of experiments not yet concluded, Dr. Bates is attacking the problem from a new angle. Since light reflected from a curved surface must change its focus if there is any change in the curvature of that surface, he is photographing the filament of an electric light reflected from various surfaces of the eyeball. As no photographer could be found to do this work, he had to learn photography himself for the purpose, and it was two years before he was able to get any satisfactory pictures. The testimony of these photographs is that the whole eyeball changes its shape during accommodation, and that the crystalline lens does not.

These accumulated observations have left no doubt in Dr. Bates's mind that the deformations of the eyeball upon which errors of refraction depend are due to an abnormal strain upon the extrinsic muscles of the orb of vision, and that, far from being permanent, they last only so long as the strain continues. The problem of curing errors of refraction, therefore, is to induce the eyes to take it easy, and look at things without effort.

This is accomplished, we are told, by a simple system of eye-education whose fundamental principle is what Dr. Bates calls central fixation. When the eye attempts to see every point in its field of vision it is subjected to a severe strain, which Dr. Bates believes to be at the bottom of most eye troubles. To quote further:

Central fixation is attained by practise and rest, the latter coming first. To rest the eyes, the patient is told to look at something black and then cover his eyes in such a way as to exclude the light and avoid pressure on the eyeballs. If he remembers the black perfectly he will see black. Otherwise he may see all the colors of the rainbow, but usually sees gray. When one does succeed in seeing black the effect is very surprizing. The vision is noticeably improved, tho it may be only for a moment, and letters on the test-card that one was unable to see before stand out clearly. The explanation offered for this phenomenon is that the eyes and brain are relaxed by seeing black, thus enabling the former to function normally.

The familiar Snellen eye-chart, used by all oculists to test the eyes of their patients, is used as a basis for the practise of central fixation, the patient being directed to try to see one part of a letter better than another. The relief which this simple expedient gives to tired eyes is astonishing, and the smaller the letter selected for the purpose the greater it is.

By means of this simple system of eye-education Dr. Bates maintains that the organs of vision can be kept always in a normal condition. The savage presumably got this education from his daily life. He was obliged, as a condition of continued existence, to focus his eyes for accurate vision at all distances. If he didn't he was eliminated. We who are protected from all the dangers from which our savage forebears could protect themselves only by their good eyesight, and whose eyes are limited for a great part of the time to a narrow range of vision, quite naturally lose this power. Under similar conditions wild animals lose it also, becoming myopic in captivity, altho they neither read nor write nor sew nor set type. The remedy is not to close our schools and stop our printing-presses and return to a primitive condition in which there was no astigmatism or short-sight, but to practise the art of seeing perfectly for a few minutes every day.