

XIV. *An Appendix to Mr. Ware's Paper on Vision.* By Sir Charles Blagden, F. R. S.

Read February 4, 1813.

MR. WARE states in his Paper, that near sightedness comes on most frequently at an early age; that it is more common in the higher than in the lower ranks of life; and that particularly at the universities, and various colleges, a large proportion of the students make use of concave glasses. All this is exactly true, and to be accounted for by one single circumstance; namely, the habit of looking at *near* objects. Children born with eyes which are capable of adjusting themselves to the most distant objects, gradually lose that power soon after they begin to read and write; those who are most addicted to study become near sighted more rapidly; and, if no means are used to counteract the habit, their eyes at length lose irrecoverably the faculty of being brought to the adjustment for parallel rays. Of this I am myself an example, and as I recollect distinctly the progress, it may not be useless to record it here.

When I first learned to read, at the usual age of four or five years, I could see most distinctly, across a wide church, the contents of a table on which the Lord's Prayer, and the Belief, were painted in suitably large letters. In a few years, that is, about the ninth or tenth of my age, being much addicted to books, I could no longer read what was painted on this table; but

the degree of near sightedness was then so small, that I found a watch-glass, though as a meniscus it made the rays diverge very little, sufficient to enable me to read the table as before. In a year or two more, the watch-glass would no longer serve my purpose; but being dissuaded from the use of a common concave glass, as likely to injure my sight, I suffered the inconvenience of a small degree of myopy, till I was more than thirty years of age. That inconvenience, however, gradually though slowly increasing all the time, at length became so grievous, that at two or three and thirty, I determined to try a concave glass; and then found, that the numbers 2 and 3 were to me in the relation so well described by Mr. WARE; that is, I could see distant objects tolerably well with the former number, but still more accurately with the latter. After contenting myself a little time with N^o. 2, I laid it wholly aside for N^o. 3; and, in the course of a few more years, came to N^o. 5, at which point my eye has now been stationary between fifteen and twenty years. An earlier use of concave glasses would probably have made me more near sighted, or would have brought on my present degree of myopy at an earlier period of life. If my friends had persuaded me to read and write with the book or paper always as far from my eye as I could see; or if I had occasionally intermitted study, and taken to field sports, or any employment which would have obliged me to look much at distant objects, it is very probable that I might not have been near sighted at all. Possibly the persons who become near sighted by having constantly to adjust their eyes to near objects, may not usually change to be long sighted by age.

On the subject of vision, I may be allowed to take this

opportunity of relating an experiment made many years ago, to decide how far the *similarity* of the images seen by each eye contributed to make them impress the mind as *one*. In the house where I then lived was a marble chimney-piece, the upper horizontal block of which was fluted vertically; and the ridge between each concavity of the fluting was about as wide as the concavity itself. When I looked at this range of fluting at the distance of about nine inches, and directed the optic axes to it, I saw of course every ridge and concavity distinctly, and judged rightly of the distance. Adjusting the optic axes as to an object a little further off, I discerned the fluting confusedly and all double, the ridges interfering with the concavities; which was accompanied with the uneasy sensation of squinting. But on widening the direction of the optic axes still more, as to an object about eighteen inches distant; (namely, just so far that the duplication of the images should correspond successively; that is, so that the first ridge and concavity of the fluting, as seen by one eye, should fall in with the second ridge and concavity, as seen by the other;) the fluting appeared as distinct and as single as at first; but it seemed to be about double the distance from the eye that it really was, and to be magnified in proportion; nor had I, in this case, any sensation of squinting. As the parts of the fluting, though in general much alike, were not exactly so every where in colour and minute circumstances, there appeared in some places a slight confusion from this dissimilarity of the images; but that trifling confusion had no manner of effect on the mind's judgment of the images, which looked as perfectly single, as when the fluting was viewed with the optic axes so directed, that the ridges and concavities seen by

one eye corresponded with the same ridges and concavities as perceived by the other. No idea was suggested, but that of a range of fluting larger and more distant than it was in fact. This experiment I frequently repeated, and always with the same effects.