

upon the cornea, it was evident that the whole phenomenon, gas light included, was in my eye so far as sight was concerned. In short, since, when a movement of the lower lid lengthens or shortens the 'rays' which appear to shoot upward toward the ceiling, and a movement of the upper lid *vice versa*, one can see that the image in his eye is inverted, because the sides of this cone and the background of the room are reversed.

If one will work this experiment to the point of perceiving that the picture of the outside world is entirely in his eye, he may come, as I did, to the fearful demonstration that even in 'full light' outside of his eye all is in a certain sense total darkness. It is a dreadful momentary concept, more dejecting than the fear which attends the coming on of blindness from destroyed vision. J. B. WOODWORTH.

CAMBRIDGE, MASS., October 12, 1895.

It follows from Mr. Woodworth's observation that the image on the retina is inverted. The 'rays of light' are not, of course, objective, but are due to imperfect accommodation. The light from a gas jet passing through the lower half of the pupil is in part refracted downward, affects the lower half of the retina, and is projected as rays extending upward. The same inference can be drawn from an examination of *Purkinje's figures* (the blood vessels of the retina), subjectively and objectively; or, indeed, by pushing the eyeball upward, in which case objects seem to move downward.

It is commonly believed that the external world sends up through the nerves little images of itself which are examined by the mind. This seems to the present writer a 'dejecting concept.' *Per contra*, the fact that the world in which we live is a mental construction assigns to mind its due place in the universe.

J. McK. C.

'CRYING WITH TWO EARS.'

IN SCIENCE for October 11th (page 487), Professor J. McK. C. corrects an inaccuracy in Professor Brooks' statement concerning the inverted image. He closes his criticism with the paragraph: "A similar paradox is the fact that with two images on the retinas we see things singly. This may also be treated without undue

seriousness by the question: 'If we hear a baby crying with two ears, why do we not think it is twins?'" What terrible sort of baby is it that cries with two ears? I protest against such a little monster. Is it not sufficient that a baby cry with one throat, and that we hear it with two ears? And are there not times when we think it is triplets? W. H. FISHBURN.

SECOND PRESBYTERIAN CHURCH,
COLUMBUS, O., October 12th, 1895.

INACCURATE ZOÖLOGY.

THE EDITOR OF SCIENCE—*Sir*: It appears to me that zoölogists should endeavor, whether for their own good or that of the science they cultivate, to see that popular zoölogical works are prepared by zoölogists, instead of being compiled by persons comparatively ignorant of the subject. Perhaps the most effectual means to this end consists in pointing out the inaccuracies of works which have not been written with sufficient knowledge, so that the public may be more careful about what it accepts. No one appreciates more than the present writer the great difficulty of ensuring perfect accuracy, and it is not suggested that those who might be criticised have not done the best in their power; the point is, rather, that the services of specialists should in every case have been secured.

Even so, curious errors will sometimes appear; perhaps usually due to the writer trying to cover too much ground. Thus in the *Standard Natural History* there is a figure of a *Pulvinaria*, called '*Coccus adonidum*;' this latter name belonging really neither to a *Coccus* (as now understood) nor a *Pulvinaria*, but a *Dactylopius*!

A few days ago the new *Standard Dictionary of the English Language* (Funk & Wagnalls Co., 1895) was received, and on looking over it I at once stumbled on the following curious items:

- (1.) The cotton scale-insect is 'a bark-louse (*Pulvinaria innumerabilis*). There is no recognized cotton scale-insect in this country, though there are scale-insects which affect cotton. *Pulvinaria innumerabilis* is not a cotton species, but affects maples in the North. *Cottony* scale is doubtless what was intended.