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.

(2.) Coccidæ have scale-like *larvæ* and live *in* plants.

(3.) A picture of a snail shows a sinistral shell, so also does the figure of *Limnæa stagnalis*. The snail is labelled *Helix pomatia*, but the figure appears to represent *Helix aspersa*.

And so on in other cases, although the bulk of the zoölogical information seems correct.

This morning was brought to me a little book which the New Mexico Territorial Board of Education have under their consideration for adoption in the High Schools. It is called *Zoology for High Schools and Academies*. (American Book Company, 1895, pp. 216.) The authoress is Margaretta Burnet. I could not very well recommend its use, after reading in it such things as the following:

(1.) p. 90. Scale insects belong to Aphididæ.

(2.) p. 132. Daddy longlegs is an example of the Scorpions.

(3.) p. 59. Figures of three 'Fresh water snail-shells.' The middle figure is a *Succinea*. On p. 56 a *Succinea* is correctly figured as a land snail.

Yours truly,

THEO. D. A. COCKERELL.

MESSILLA PARK, NEW MEXICO.

SCIENTIFIC LITERATURE.

Allgemeine Physiologie. Ein Grundriss der Lehre vom Leben. Von MAX VERWORN. Mit 270 Abbildungen. Jena, Gustav Fischer. 8vo. Pp. xi., 584.

This work is a very acceptable addition to the series of biological text-books issued by Fischer of Jena, and takes its place worthily. In size and general appearance it conforms to the model adopted by the same publisher for Hertwig's Embryology, Wiedersheim's Comparative Anatomy, Ziegler's Pathology, and other familiar authoritative and important manuals.

Verworn attempts to present a summary of principles of physiology applicable to both plants and animals generally. He covers, therefore, somewhat the same ground as Claude Bernard in his classic work of 'Les Phenomènes de la Vie communes aux Plantes et aux Animaux.' But whereas the French physiologist included much original research in his work, his German successor gives rather a collation of the results hitherto attained. It is certainly unfortunate that 'General Physiology' has been treated as a stepchild of Biology and left pretty much to shift for herself. Verworn renders, therefore, a substantial service in his book by directing attention rightly, and at the same time presenting many aspects of the subject in so comprehensive a manner as greatly to facilitate the further pursuit of this neglected branch of biological science. Such an attempt, when first made, must necessarily be partially successful at the best, because the material to be brought together is scattered in a great variety of memoirs, and occurs often as an incidental part of researches upon some problem of special physiology, vegetable or animal.

We must judge such a work by what it contains, not by what it omits. The first chapter, which occupies nearly sixty pages, seems to me inappropriate, and not to add to the scientific usefulness of the whole. It deals with 'the ways and means of physiological investigation,' according to the title chosen for it by the author. But ways and means do not signify to him practical methods, but rather a series of philosophical and metaphysical concepts, which appear to me neither very profound nor original, and which certainly lack any obvious bearing on the rest of the work. The chapter, however, includes a brief historical review of the progress of physiology. This review is well done.

The remaining chapters are properly physiological; their titles will indicate their chapters:

Chapter II. On the living substance.

Chapter III. On the elementary phenomena of life.

Chapter IV. On the general conditions of life.

Chapter V. On stimuli and their action.

Chapter VI. On the mechanism of life.

In each chapter will be found many facts collated, such as one cannot readily find elsewhere brought into mutual relations. For example, in Chapter IV. there are considered the present conditions of life in the world, the origin of life on the earth and the history of death, and in Chapter V. the general nature of stimuli, and