

then the observation-room, a red and green may still appear saturated and of equal brightness by direct vision; but to indirect vision the green will appear brighter, because the different admixtures of white in the two colors will become more perceptible. 6. The Purkinje phenomenon is essentially unchanged, when homogeneous spectral light is used, in place of colored glasses or papers. 7. König has made extended measurements, in which, having made two different spectral colors of the same apparent brightness, he repeated the operation for different degrees of light-intensity of one of the lights. He found that intensities of the second light were necessary, in order to make it appear equally bright, which showed a constantly different relation to the intensity of the first light, varying with the degree of intensity of the latter. These measurements are unreliable, because the apparent intensity of the lights he used depended not only on their 'absolute intensity,' but also to a large extent on the momentary and changing adaptation of the eye; and he took no account of the latter factor.

BROWN UNIVERSITY.

E. B. DELABARRE.

Die Spontane Umwandlung der Nachbilder der Sonne in reguläre Sechsecke oder Achtecke. G. WAGNER. *Zeitsch f. Psy.* Band IX, Heft I. Pp. 17-22.

Subjective Visual Sensations. W. R. GOWERS. The Bowman Lecture, delivered before the Ophthalmological Society on June 14, 1895. The *Lancet*, June 22 and 29. *Nature*, July 4 (condensed).

Dr. Wagner has observed that the circular after-image of the sun may in his case spontaneously change to a hexagon or an octagon. The change usually occurs in the negative phase of the image, but after it has taken place it lasts until the image disappears. He sees the phenomenon best when he gets by accident an image of the setting sun and on the periphery of the retina. He says the beginner must practice regularly for fourteen days before he can expect to see the images, but does not make it clear whether or not his observation has been confirmed by others. The 'beginner' should, however, be very careful in undertaking to observe after-images of the sun, or he will suffer the experience so graphically described by Newton. The hexagons observed by Dr. Wagner seem related to that seen by Purkinje (*Physiologie der Sinne*) on revolving wheels—which he could only see with one of his eyes and which does not seem to have been subsequently confirmed—and the hexagonal subdivision of the field of vision described by Dr. König (*Gräfe's Archiv*, XXX). The hexagons would seem to be due to some structural

peculiarity of the retina, but no anatomical basis has been observed, and it may be necessary to seek for it in the brain rather than in the retina.

Dr. Gowers in an interesting lecture describes the subjective visual sensations preceding epileptic fits and migraine or 'sick-headache.' In the case of epilepsy the images may be 'stars,' flashes or luminous spheres, or they may be hallucinations. The image often crosses the field of vision and is followed by movements of the head and eyes. A curious fact is that bright reds and greens may appear in the periphery of the retina beyond the field usually assigned to color-vision—a fact the present writer has observed in the case of after-images. Dr. Gowers exhibited and deposited with the society sets of drawings showing images which occurred as precursory symptoms of sick headaches. These are zig-zag lines resembling the outlines used in fortifications. The angled and zig-zag lines seem related to the hexagons noticed above. Dr. Gowers thinks the phenomena are due to discharge in cerebral centers, and the present writer believes that this is correct and that it is not reasonable to attribute the complex phenomena of vision chiefly to the retina.

J. McK. C.

ETHICAL.

The Rise and Development of the Moral Feelings. A. A. TOKARSKIY.
Voprosi filosofi, VI, 1, Jan., 1895.

We receive from the external world feelings and groups of feelings (or perceptions) which function in memory as ideas and concepts. Each feeling and perception is accompanied by a felt tone, which is either pleasurable or painful. These qualities of pleasure or pain awaken corresponding ideas and concepts, only weaker in degree; but unlike the original feelings, which proceed by reaction of the organism upon external stimulation, the corresponding ideas and concepts are dependent exclusively upon the nature and social position of the percipient. Consequently as from the ideas one cannot always infer the corresponding feeling, just so the same feeling hardly ever accompanies the same idea. This general psychological observation may apply to those feelings called moral.

Moreover since every feeling has in consciousness a corresponding idea we find at the same time growing up through a process of abstraction a few universal principles to which each class of feelings is invariably referred. That is, as we know the percepts and ideas with which moral feelings are united in us, just so we are able to