It seems to the reviewer that the second test might have been modified very simply by giving all of the heat-tests without objective warming of the coil. This variation in method should be tried before it is finally concluded that the suggestibility of an observer varies from test to test, without being affected by any general mental disposition such as most writers have in mind when they speak of an individual's suggestibility.

A more serious criticism may be directed against the flight of color test. Suggestibility is assumed to be demonstrated, as we have noted, by departure from the "normal sequence," blue, green, red, blue,—a sequence apparently taken from Helmholtz. Now the flight of colors after exposure to white light has by no means a normal sequence. In the second, or negative stage, the sequence red, blue, green, is, to be sure, very constant and obtained by most observers under somewhat varied conditions; but the first or positive stage is essentially variable; what is seen depends (*a*) upon individual differences in the functioning of the retina, (*b*) upon the amount of practice the observer has had, (*c*) upon the degree of adaptation secured before the exposure, (*d*) upon the extent, intensity and duration of stimulus. Scott gives us no exact statement of the degree of adaptation, and it is fair to assume that the intensity of the stimulus varied with the condition of the sky. If adaptation lasted five minutes, the positive image would often show patches of red or of green within the first 10 seconds, and if the illumination were much diminished, the first image would be reddish white. It follows that the report of red within 20 sec. is not, as Scott assumes, a clear demonstration of suggestibility. If this criticism be correct, the whole argument against the existence of general suggestibility, so far as Scott's work goes, falls to the ground.

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BORIS SIDIS. *An Experimental Study of Sleep*. Boston: Richard G. Badger, 1909. Pp. 106.

Dr. Sidis has made a significant contribution to the study of sleep through a series of laboratory experiments on frogs, guinea pigs, cats, dogs, and infants. He finds that the condition of sleep is similar to the condition produced by suggestion, both normal and abnormal. In these experiments he followed somewhat the same method as in experiments upon suggestion—monotony of stimulation and limitation and restriction of voluntary movements—and produced similar results. Before

passing into the sleep state the subjects experimented upon passed through the hypnoidal or subwaking state. The same was noticed upon passing out of the sleep state. This intermediate state is brief and very unstable and oscillates between the waking state and sleep or hypnosis.

In part II the author formulates his theory of sleep in terms of cell energy and stimulus exhaustion. Living tissue responds to an external stimulus with some discharge of energy. The ability to respond has a certain limit. If the intensity of the stimulus remains the same, the result of stimulation becomes constantly less, and the stimulus finally fails to incite a response: the monotony of stimulation raises the threshold. What has been said of the cell applies also to the organism in general: the organism is asleep to a certain environment, when it fails to respond to it. Yet the same organism may be awake to stimuli which have as yet not exhausted themselves. This condition throws considerable light upon dream-life instinctive. It has developed out of the hypnoidal state. "Sleep is an and subconscious activities in general. He concludes that sleep is inactively induced passive state in relation to the external environment.

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T. H. MORGAN: *Chance or Purpose in the Origin and Evolution of Adaptation*. Science, 33: 789, Feb. 11, 1910. Pp. 201-210.

Professor Morgan is dissatisfied with the theory that adaptation is to be explained on the assumption that variations "chance" to find an environment suited to them. He feels that there must be some closer bond that "insures the continuance in a given direction of variations once begun," and he believes that the true explanation is to be sought in the assumed tendency of the germinal material, once it shows itself susceptible of change in an environment, to vary further in the same direction in that environment. In other words, the first accidental adaptation "loads the dice" for further favorable variations. "Each step that the organism has taken guarantees further responses in the same direction * * * The mechanism of survival * * * is such that it insures success where it is most called for."

W. C. B.