Book Reviews

Electro-Sleep. V. A. Giliarovskii, N. M. Liventsev, Yu. E. Segal, Z. A. Kirillova. State Publishing House of Medical Literature, Moscow, U.S.S.R., 1953. 126 pp. Illus. (In Russian)

I. P. Pavlov postulated that sleep represents an irradiation of inhibition. This spread of inhibition is a protective mechanism that is designed to shield the cerebral cortex from excessive stimulation. This inhibitory state or sleep permits the cells of the higher nerve centers to recuperate.

Pavlov, therefore, conceived the idea of the extensive utilization of sleep as a therapeutic measure, particularly in patients with mental disease. In fact, Pavlov considered schizophrenia, with its attendant fixation, confusion, negativism, and so forth, as a form of protective inhibition of the cerebral cortex in the face of excessive traumatizing bombardment with stimuli. The task of the physician, according to Pavlov, is to deepen further this protective inhibition by placing the patients in a calm, restful environment and by utilizing sedative or hypnotic doses of central nervous system depressants—for example, bromides.

Soviet physicians have utilized with apparent success a wide variety of pharmacologic hypnotic agents, including barbiturates, as a means of inducing protective sleep in patients with mental diseases as well as in patients who are suffering from diseases with important psychosomatic components—for example, hypertention and peptic ulcer. Sleep was induced for rather long periods of time: 3 to 4 weeks. The patients were kept asleep for a large portion of each 24-hour period. Naturally, the administration of hypnotics for such long periods produced many undesirable toxic side effects. The result was a search for other means of inducing sleep.

The authors began to investigate the possibilities of using electric currents to produce sleep. Their first experiments dealt with attempts to utilize the methods of electronarcosis that were originally described by S. Leduc [Compt. Rend. Akad. Sci., Paris (1902)]. Electronarcosis is achieved by the application of strong currents that produce a condition which, according to Leduc, resembles either natural sleep or anesthesia.

After extensive experiments on animals and on themselves, the authors of this book came to the conclusion that electronarcosis does not possess the characteristics of either sleep or anesthesia, but that it is a condition closely resembling, if not identical with, the phenomenon of parabiosis that was described by N. E. Vvedenskii [*Survey of Psychiatry*, No. 2, 3 (1902) (in Russian); *Excitation, Inhibition and Narcosis*. Collected Papers, Vol. IV (Leningrad State University, Leningrad, 1935) (in Russian)].

Vvedenskii described parabiosis as a form of nerve block resulting from unusual or strong stimulation. Briefly, Vvedenskii conceived parabiosis as fitting in with the following scheme:

$$\text{Rest} \rightleftarrows \text{activity} \rightleftarrows \text{parabiosis} \rightarrow \text{death.}$$

Parabiosis is thus the last reversible condition resulting from the application of unusual or excessive stimuli. Originally, Vvedenskii observed this phenomenon in nerve-muscle preparations. Later, he applied this concept to the central nervous system.

The authors consider electronarcosis to be a form of parabiosis. The effects on animals and human subjects are more comparable to those induced by electroshock than they are to those induced by anesthesia or natural sleep. They consider electronarcosis to be unsuitable for clinical use for at least two reasons: (i) the occurrence in many cases of "hyperkinetic" reactions, and (ii) unpleasant sensations by the patient lasting for about a day following the application of the current. Moreover, the "narcotic" state lasts only as long as the current is applied, which can be done for only short periods (several minutes).

For these reasons, the authors developed an apparatus that can induce a condition referred to as electrosleep. This is based on I. P. Pavlov's observation that sleep could be induced in dogs by the application of rhythmic electric stimuli of low intensity to the skin of the animals. The authors applied electric stimuli of low intensity and constant polarity at a low frequency (½ second). The duration of each stimulus was 0.2 to 0.3 milliseconds, a period corresponding to the chronaxie of the brain cells. The electrodes were placed in the temporal-frontal position. Application of these stimuli usually produced drowsiness during the passage of the current and was often followed by a deeper sleep after the stimuli were removed. In some cases, sleep developed after the electric stimuli were discontinued. During this therapy, many of the patients also showed improvement and regularization of sleep during the nights.

The authors cite a number of case histories to indicate the encouraging results obtained with electrosleep in patients with mental diseases (including schizophrenia), neuroses, and asthenic conditions. Successful therapy was also reported in cases with encephalitis and in early stages of toxemias of pregnancy. Investigations are being conducted in applying this form of therapy to patients with hypertension and peptic ulcer.

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Clays and Clay Minerals. Proceedings of the second national conference on Clays and Clay Minerals. University of Missouri, 15–17 Oct. 1953. Ada Swineford and Norman Plummer, Eds. National Academy of Sciences–National Research Council, Washington, 1954. 498 pp. Illus. $4.

The proceedings of the second national conference on Clays and Clay Minerals contain 36 papers by 64 contributors. These include mineralogists, crystallographers, petrographers, and other geologists as well as physicists, chemists, ceramists, soil scientists, and petroleum and civil engineers, all of whom are actively engaged in research in their respective fields. The book begins with an annotated mileage guide to the diaspore and flint clays and to the Putnam soil of Missouri that were visited on a field trip during the conference, which was held at the University of Missouri in October 1953. Papers are presented on the genesis, occurrence, and diagenesis of clays, methods of identification, fundamental crystallographic and chemical studies, and a variety of subjects including thermodynamics, ion exchange, and the mechanism of the deformation of clay.

The origins of Missouri fire clays, some Pennsylvanian shales of Indiana and Illinois, clays in the northern Gulf of Mexico, and some formations that outcrop on the Gulf Coast are discussed. Several papers are devoted to the clay mineral composition of Recent sediments and