have been cultivated for some time they may still produce further dissociants, even when single cell isolations are used and it is, therefore, simpler to refer to them as "cultures" or "growths" rather than as "strains."

Likewise, when a culture from, *e.g.*, the pharynx is plated so as to obtain discrete colonies, it is difficult to determine by simple methods whether or not the different colonies in each group of bacteria are genetically similar. Therefore, the appellation "culture" for such individual colonies is again preferable to "strain" which should be reserved for those offspring of a single "pure" culture or better still, of a single cell. Conversely, microorganisms that differ in certain biochemical properties may not necessarily be different "strains," and they should only be considered as such when it is known that they are genetically unrelated.

GEORGE H. CHAPMAN

CLINICAL RESEARCH LABORATORY,
NEW YORK 20, N. Y.

SLEEP-ELECTRO-SHOCK THERAPY

IN the course of treatment of depressed patients with electro-shock therapy, two complications have occasionally arisen which have proved quite disturbing. One is the reaction of fear gradually built up in some patients as treatments are repeated. Such patients frequently refuse to continue with the treatment and are thus unable to benefit from a course of therapy which by now is recognized as being definitely helpful in such cases.[1] The other complication appears in the form of psychomotor excitability as manifested by excitement, agitation, restlessness, shouting and combativeness in patients following the orthodox electro-shock treatment. The importance of quieting such patients arises from the fact that unless forced restraint is applied these patients can damage either themselves or those in their immediate environment.

It has recently been found that both of these complications may be forestalled by the utilization of a sleep-electro-shock therapy.

This consists in the preliminary administration of an intravenous injection of an aqueous solution of pentothal-sodium in a dosage sufficient to produce sleep. The type of administration will vary with the patient. If, for example, one wishes to elicit psychogenic material during the process by the method of narco-analysis[2] a 2.5 per cent. solution is injected at a rate of 1 cc per minute. As the patient becomes drowsy, questioning can be carried on and responses noted. In other patients the injection may be made more rapidly—when 5–7 cc of a 5 per cent. solution induces prompt sleep.

While asleep, the electrodes may be applied to the patient and one of two indicators may be used as the propitious moment for applying the current. In a deeper stage of sleep the patient remains motionless. The corneal reflex is tested. When its response is noted the application of current which by the orthodox method was found to be a convulsive dose will result in a minor (non-convulsive) reaction. If, on the other hand, the current is not applied until the patient shows his first spontaneous movement then this same dosage-results in a major (convulsive) reaction.

In either case the patient awakens in a calm manner and remains quite docile and friendly.

By means of this sleep-electro-shock therapy patients who would otherwise have remained untreated have continued to take treatment.[2, 3] It is hoped that others beset with the same difficulties will also find this method helpful.

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H. S. RUBINSTEIN

ALFRED ULLMAN LABORATORY
FOR NEUROPSYCHIATRIC RESEARCH,
SINAI HOSPITAL, BALTIMORE, MD.

EARLY CENOZOIC FACIES IN THE ROCKY MOUNTAIN REGION

STUDIES of early Cenozoic deposits in the Rocky Mountain region reveal evidence of distinctive faunal and sedimentary facies.

Paleocene and Early Eocene assemblages of fossil mammals include members of two different faunal facies. Almost all the collections from drab Paleocene formations and a few from gray layers in red-banded Paleocene and Early Eocene deposits have been found concentrated in small "pockets" or "quarries." These faunas are composed chiefly of diminutive multituberculates, marsupials, insectivores, primates and rodents that were members of an arboreal forest community. Most of the fossils from the red-banded sediments, on the contrary, have been found scattered throughout the matrix, and these are the remains of larger terrestrial forms—"subungulates," condylarths, creodonts, artiodactyls and perissodactyls —mammals that probably lived in a savannah environment.

The consistent association of a forest fauna with drab deposits and of savannah dwellers with red-

[1] N. D. C. Lewis, H. C. Solomon and H. E. Bennett, *Amer. Jour. Psychiat.*, 101: 267, 1944.

[2] H. S. Rubinstein, "The Fear-Allaying Effect of Pentothal-Sodium in Electro-Shock Therapy." Ready for publication.

[3] H. S. Rubinstein, "The Use of Pentothal-Sodium as a Psychomotor Depressant in Electro-Shock Therapy." Ready for publication.

banded sediments suggests that the gray layers accumulated in forest swamps and the red to buff bands may have been deposited on flood plains in open country.

If these data have been interpreted correctly, it is significant that most Paleocene sediments in the Rocky Mountain region are drab whereas most Early Eocene formations are red-banded, for the situation suggests that forests were widespread in the Paleocene epoch but during the Early Eocene savannahs and forests fluctuated to produce extensive variegated deposits.

Both Paleocene and Early Eocene floral assemblages consist of warm-temperate to subtropical types, indicating humid, lowland conditions in the basins. Moreover, the presence of the same species of Early Eocene mammals in more than one basin reveals that there were no continuous topographic barriers impeding migration of lowland animals. Nevertheless, Rocky Mountain structures were being actively deformed during this interval. Hence the continuanee of a humid, lowland environment suggests either that erosion kept pace with orogenic uplift and maintained a mature stage of topography, or that deformation took place without important upward movement.

In the Big Horn, Bridger, Washakie, Uinta and Piceance Creek basins the extensive red-banded fluviatile facies is conformably overlain by lacustrine deposits of Middle Eocene age. (In some areas the lake sediments began to accumulate before the end of Early Eocene time). In marked contrast to the irregular, lenticular layers of red and gray shale in the variegated deposits, the lacustrine facies is characterized by alternating units of evenly bedded shale rich in organic matter and fine-grained sandstone. A synthesis of stratigraphic sections of the Green River formation in southern Wyoming reveals that finely laminated oil shale accumulated at the center of the lake, while shoreward, the rich oil shale grades into a thinner, coarser shore facies composed of fine-grained sandstone in which freshwater gastropods and pelecypods abound, humic shale and lignite layers, and ostracode-bearing marlstone and low-grade oil shale. This facies in turn interfingers with fluviatile "Wasatch" and Bridger deposits at the margin of the basin. The Tatman formation in the Big Horn Basin is very similar to the shore facies of the Green River Formation, and probably was deposited in the open waters of a shallow lake and in forest swamps that displaced the lake from time to time.

The persistence of a lowland, warm-temperate to subtropical flora in the basins through the Middle Eocene demonstrates that Laramide deformation effected no pronounced change in the topography or the climate of the Rocky Mountain region in early Cenozoic time.

FRANKLYN B. VAN HOUTEN

SCIENTIFIC BOOKS

THE HOPI WAY

The Hopi Way. By LAURA THOMPSON and ALICE JOSEPH. Lawrence, Kans.: Haskell Institute. Chicago: University of Chicago Press. 151 pp. Illustrated. 1944. $3.00.

THIS volume is the first published result of a series of studies of American Indian tribes, conducted and sponsored jointly over a three-year period by the U. S. Office of Indian Affairs and the Committee on Human Development of the University of Chicago. As the Honorable John Collier, until recently commissioner of Indian Affairs, explains in the foreword, the project has for its aim the shedding of light on many of the administrative problems confronting the members of the Indian Service.

To a considerable degree the light generated by the authors of "The Hopi Way" comes from a merging of two techniques. Dr. Laura Thompson, an anthropologist, provides a summary of Hopi culture based on standard ethnological works; and Dr. Alice Joseph, a physician and neuro-psychiatrist, presents an analysis of Hopi personality as revealed by a number of psychological and psychiatric tests. The subjects tested were children, aged six to eighteen, from the pueblos situated at First and Third Mesas in Arizona. A total of 190 boys and girls were investigated in the field, representing about 12 per cent. of all Hopi children in the age group under consideration.

The book begins with a comprehensive but concisely written account of Hopi life and custom, placed against a background of the tribe's history and geographical environment. There then follow a group of portraits of Hopi children and a series of psychological analyses, and the work concludes with an interesting retrospect in which Dr. Thompson skilfully combines the ethnological and psychological data into an integrated picture of Hopi culture and personality.

Throughout the volume the authors are careful not to overstate their claims, emphasizing the fact that the present study "has been designed to serve as a basis for further research on the problem of Hopi administration," and humbly offering the work as a contribution "toward the development of a scientific method of cooperative social analysis. . . . " (pp. 13, 14). In view of such restraint it would ill become a reviewer to harp on the authors' mistakes; but since