botanical section of the British Association on the geographic distribution of past floras, Wieland's novel but not new view as to the polar origin of life, and Schulz's papers on the geological development of the flora of the Saale and the Suabian Alps.

In closing, a word may be said as to the present status of Briquet's polytopic theory, a theory commonly discarded as untenable, but which the mutation theory and the growing belief in polyphylesis make more probable. The idea that a species may originate in more than one place, simultaneously or not, did not originate with Briquet, but he resuscitated it and christened it the polytopic theory. Though discarded by Jerosch and most writers, as unlikely if not unthinkable, Willis believes that the same step might be taken by species that are far apart, especially in similar conditions; indeed he thinks that this has actually happened within the Podostemaceæ. Arber has favored the idea of homeomorphy or parallelism of descent. Engler has admitted that varieties may originate more than once. It will be recalled that in DeVries's experiments the same species recurred many times, and that too from different parents. Blackman has found that about twenty per cent. of the arctic and antarctic algæ are identical as to species, but not found elsewhere. It will be conceded that in such a case the difficulties in the way of migration during the present or past ages are very great, while the polytopic theory seems to afford an easy explanation. Perhaps it is too easy; in any event it seems adapted for use as a last resort rather than as a general panacea. However, the researches of the past few years have placed the theory of polytopic origins in a position to demand the thoughtful consideration of all students of evolution.

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SCIENTIFIC BOOKS.

Desert Botanical Laboratory of the Carnegie Institution. By FREDERICK V. COVILLE and DANIEL TREMBLY MACDOUGAL. Published by the Carnegie Institution. Washington, November, 1903. Pp. 58, with 29 plates and 4 charts.

This attractive account of a botanical reconnoissance of the desert areas of the southwest will, without doubt, awaken great interest in desert vegetation, and stimulate the thorough investigation of the adaptations of xerophytes. The debt which ecology owes to Drs. Coville and MacDougal for fostering the idea of a desert laboratory, and for carrying it to a successful conclusion must become more and more apparent as the work progresses. The report deals in a very interesting though necessarily general fashion with the vegetation of the areas visited in connection with the location of the laboratory. These were: (1) The arid region of western Texas; (2) the sand dunes of Chihuahua; (3) the White Sands of the Tularosa Desert; (4) the vicinity of Tucson; (5) the gulf region about Torres and Guaymas; (6) the Colorado Desert; (7) the Mohave Desert; (8) the Grand Canyon of the Colorado.

In many ways the most interesting region to the ecologist is that of the White Sands of the Tularosa Desert. These are for the most part mobile dunes, composed entirely of gypsum; they cover nearly four hundred square miles. The soil is necessarily alkaline, a fact clearly indicated also by the abundance of *Atriplex* and *Suæda*. The characteristic vegetation of the dunes consists of woody plants, chief of which are *Rhus trilobata, Atriplex canescens, Chrysothamnus* and *Yucca radiosa*. *Yucca*, by virtue of its striking ability to push up through a sand cover, is a typical dune former. The White Sands when critically investigated should add an interesting chapter to the developmental history of dunes. The selection of Tucson for a laboratory site was based upon the variety and distinctness of its desert flora, as well as upon its being both habitable and accessible. The vegetation in the neighborhood of Tucson consists mostly

of *Covillea, Prosopis, Acacia, Opuntia, Echinocactus, Cereus, Parkinsonia,* etc. The presence of the Santa Catalina range, which rises to 6,000 feet, adds a mountain element to the vegetation. A further advantage of great importance lies in the central location of the laboratory with reference to the deserts of Texas, Mexico and California.

The general physical features of deserts are discussed in a caption filled with valuable meteorological and soil data. In connection with the latter, it is pointed out that lack of water is the fundamental cause of deserts, and that areas in which the water content is largely non-available are deserts as well as those in which the water content is low. The current conceptions of deserts are shown to be wholly inaccurate, particularly with respect to vegetation. Two great desert regions, called the Sonora-Nevada and the Chihuahua desert, are recognized by the authors. The former corresponds to the Great Basin region and the dry coast lands of northwestern Mexico; the latter extends northward from Chihuahua through parts of Arizona, New Mexico and Texas to the Bad Lands of South Dakota and the Red Desert of Wyoming. The annual rainfall in the most intense areas is less than 3 inches; in the least intense, 14–16 inches. Maximum temperatures of 110°–120° F. are frequent during the summer. The relative humidity is very low, the minimum frequently falling below 15°. The critical investigation of the physical factors, especially the water content, of these deserts is an alluring field for future workers at the Desert Laboratory.

Dr. MacDougal contributes a series of instructive experiments upon the transpiration of certain xerophytes of the region with relation to temperature, and makes an illuminating comparison of the results with those obtained from mesophytes. The xerophyte, in spite of its great insolation and the low humidity, loses water less rapidly than the mesophyte. The report closes with a valuable bibliography of desert vegetation, and of the climate, soil and water of deserts, which has been prepared by Dr. Cannon. It can not be too highly praised for the beauty of the plates, which have a much greater value for the understanding of the text than is at present the fashion in ecology.

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International Catalogue of Scientific Literature. First Annual Issue—Q—Physiology. Including Experimental Psychology, Pharmacology and Experimental Pathology. Part I., pp. xiv + 404, 1902. Part II., pp. xii + 664, 1903. London, Harrison & Sons.

Physiologists will heartily welcome this long-expected catalogue. The first volume, which has recently appeared after some delay, is devoted to the literature of 1901 (a fact which should be, but is not, mentioned on the title page), and includes 1,094 pages of text and the surprisingly large number of 6,010 titles. Owing to the difficulties of organizing the work of the regional bureaus in the time at hand, it is issued in two separate parts; but it is intended that in the future only a single unbroken volume in each year shall be published. Each part of the present volume opens with a preface and instructions to the reader, both in the English language only. It would enhance their value if the instructions were printed also in French, German and Italian. There follow in order a schedule of classification and an index of the subject-matter of the science, which are repeated in each of the above four languages; then an authors' catalogue and a subject catalogue; and, lastly, a list of journals.

The scheme of classification of subject-matter is practically that which was submitted for criticism five years ago, though a considerable number of new subjects are introduced, and the order in some cases is changed for the better. It is to be regretted that one defect, earlier pointed out, was not remedied, namely, the introduction of a group to include general physiological phenomena, such as physiological division of labor, irritability, summation of stimuli, rhythm, specific energy, automaticity, fatigue, etc. If a reader wishes to learn what has been written on these subjects during the year, he finds it possible only by going through practically the whole scheme of classification. Rhythm and fatigue are found entered in the