petrographic thin sections cut from parts of 14 concretions. The grains recorded as "polished" are either circular or elliptical in section. If they were originally formed in the interiors of the foraminiferal shells the shells had been entirely removed and the grains rounded prior to their inclusion within the concretions.

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PEAT UNDER A DELAWARE BEACH

THE article by Dr. Richards on the occurrence of sod under the New Jersey beaches, which appeared in SCIENCE for June 19, interested me very much. Similar material was found in 1911 on the beach at Rehoboth, Del. This was reported and figured in an article published in 1913.[1]

The material, a mass of peat several feet long, was exposed twice during the summer, after severe storms. It was embedded in the sand and appeared to continue landward as it disappeared under the sloping beach. A piece approximately a foot and a half in diameter was broken from the mass and is now in the Museum of the Department of Botany, Wellesley College. Other deposits, one described by a fisherman as "turf with stumps in it," were reported to have been exposed during winter storms.

The occurrence of peat in this situation was interpreted at that time as the remains of a marsh flora, developed from a lagoon formed by an old fringing bar. As the bar was pushed inland the sand overwhelmed the marsh and continued retreat of the shore line again exposed the buried vegetation.

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SPECIAL CORRESPONDENCE

A FLORA OF MEXICO

OUR knowledge of the flora of Mexico is scattered through a multitude of systematic papers and a relatively small number of local floras, with only very few general works. The fundamental work for the study of the flora as a whole, Hemsley's four volumes of "Botany" (1879–88) in Salvin and Godman's great "Biologia Centrali-Americana," enumerates 12,233 species of vascular plants growing in the region from Mexico to Panama, with the citation of synonyms and specimens examined (the latter almost confined to the material in the Kew Herbarium). There are no keys, no vernacular names and no account of uses, and the botanist who does not have access to a large botanical library can derive little profit from it. Paul C. Standley's "Trees and Shrubs of Mexico" (1920–26) covers the woody plants very satisfactorily, giving keys, brief descriptions, synonymy and range, but its greatest value, perhaps, lies in the condensed accounts of uses and lists of vernacular names which the author has brought together under each species. The approximately 5,700 species included in this work represents perhaps half the known flora. The floras of several of the islands on the west coast have been published by Sereno Watson, E. L. Greene, J. N. Rose (partly in collaboration with George Vasey), Alice Eastwood and Mrs. R. S. Ferris. L. A. M. Riley's "Contribution to the flora of Sinaloa" (1923–24) was left incomplete at the death of the author and covers only the Polypetalae. A flora of the same state, the descriptive part of which, containing various new species, is unfortunately printed on unnumbered pages so as to be almost impossible to cite, is in process of publication by J. G. Ortega in the "Boletín de Procultura Regional" of the Sociedad Cooperativa Limitada of Mazatlán. Millspaugh's "Plantae Yucatanae," mostly written in collaboration with Mrs. Agnes Chase, was suspended nearly thirty years ago, after only five families had been covered. This gap has been filled by Standley's "Flora of Yucatan" (1930), the only complete flora of any Mexican state. The very interesting flora of the peninsula of Lower California, an area not included in Hemsley's "Botany," has been pretty thoroughly covered by T. S. Brandegee, especially as to the "Cape Region," and additional lists of value have been published by E. A. Goldman and I. M. Johnston.

The participation of United States botanists in the investigation of the flora below the present northern boundary of Mexico practically began with Asa Gray's papers on Charles Wright's second Texan and New Mexican collection (1853) and on Thurber's New Mexican and Sonoran collections (1854), and Torrey's "Botany of the [Mexican] Boundary" (1859), in which Gray collaborated. Into these works occasional species collected within the present limits of Mexico were introduced. Gray's papers on Xantus' plants from Lower California and L. C. Ervendberg's from Wartenberg, near Tantoyuca (both in 1861), were the first papers devoted entirely to Mexican plants published in this country. After a gap of fifteen years, Sereno Watson's two papers (1876) on

[1] Laetitia M. Snow, "Progressive and retrogressive changes in the plant associations of the Delaware coast," *Bot. Gaz.*, 55 (1): 45–55, fig. 6, 1913.

the flora of Guadalupe Island, based on Palmer's 1875 collection, began the long series of publications from the Gray Herbarium devoted to the results of the Mexican explorations of Palmer, Pringle and other collectors. The paper by George Vasey and J. N. Rose (1889) on Palmer's plants of 1889 from Lower California initiated the activity of the U. S. National Herbarium in the description of the Mexican flora, in the investigation of which Dr. Edward Palmer, who collected for the United States Department of Agriculture, played a part equalled only by Pringle.

It will be noticed that with the exception of two floras, both of which are incomplete, all the publications above mentioned on the geographical botany of Mexico since the time of Hemsley have been produced by botanists of the United States. An explanation of this, of course, is to be found in the relative accessibility of Mexico as a collecting field to the botanists of its northern neighbor. Of the trinity of modern botanical collectors in Mexico whose specimens have been widely distributed—Palmer, Pringle and Purpus —the two first were citizens of the United States and the third collected principally for T. S. Brandegee. The very extensive Mexican collections of J. N. Rose are, of course, found principally in the U. S. National Herbarium. The largest collection ever made in a relatively small area in Mexico, that of Brother G. Arsène and his associates from the regions of Michoacán and Puebla, is most completely represented in the same herbarium.

The case is quite otherwise as regards our knowledge of the useful and medicinal plants of Mexico and their vernacular names. These matters appear to have received no attention from Pringle, but were among the primary objects of Palmer's work in Mexico on behalf of the Department of Agriculture. Opportunities for acquiring information on such subjects, however, are of course much greater to residents of a country than to those who visit it only on relatively brief collecting trips. We find, consequently, that most of the important contributions have been made by botanists resident in Mexico. The principal works on medicinal plants are L. Flores' "Manual terapéutico de plantas mexicanas" (1909), B. Cuevas' "Plantas medicinales de Yucatán . . ." (1913), and L. Suc's "Les plantes medicinales du Mexique" (1912), the last a compilation from the University of Toulouse. For useful plants in general, the outstanding works are J. N. Rose's "Notes on useful plants of Mexico" (1899), which was based principally on the author's own observations and those of Palmer, and M. Martínez' "Las plantas mas utiles que existen en la república mexicana" (1928). For vernacular names, the principal sources are J. Ramírez and G. V. Alcocer's "Sinonimia vulgar y científica de las plantas mexicanas" (1902), and M. Martínez' "Catálogo alfabético de nombres vulgares y científicos de plantas que existen en Mexico" (1923–). The latter, not yet completed, is similar in plan to Ramírez and Alcocer's "Sinonimia," but contains many additional names. Nicolas Leon's "Biblioteca botánico-mexicana" (1895), a work of 372 pages, contains an alphabetical list, with publications, of 805 authors who have written on the flora of Mexico, with sketches of botanical explorations and collectors. José Ramírez' "La vegetatión de Mexico . . ." (1899) discusses the phytogeographical divisions of Mexico proposed by various authors, and in addition contains a useful hundred-page list of altitudes of localities. The only attempt at a list of Mexican plants since Hemsley, M. Urbina's "Catálogo de plantas mexicanas (fanerógamos)" (1897), based on the collections of the Museo Nacional, contains only about 3,000 species, and represents less than a third of the known flora.

The task of bringing into one work the information scattered through so many publications is a gigantic one. It has been undertaken by Professor Cassiano Conzatti, of Oaxaca de Juarez, known to botanists of the United States for many years as the collector of excellent specimens of Mexican plants. More than thirty years ago Professor Conzatti, in collaboration with L. C. Smith, a clergyman in Oaxaca, published Parts 2 and 3 of a "Flora sinóptica mexicana" (1895–7). A second edition of Part 3 was published in 1910, but Part 1 has never been published. The parts published included 2,505 species, representing only the Corolliflorae. Professor Conzatti is now actively engaged in the preparation of another work, with the same title, intended to summarize our present knowledge of the vascular plants of Mexico. It will include descriptions, abridged but sufficiently full for purposes of identification, of all the families, genera and species, with their principal synonyms, their ranges and an account of their important economic uses. The treatment of the first 60 families, from ferns to Iridaceae, has already been written. From the nature of the case, the work will be largely a compilation, and the author wishes to obtain the consent of United States botanists to the use in free translation of their published works on the Mexican flora for his book. One of his primary aims is to stimulate the spirit of observation and study among the youth of Mexico by making available to them in their own language a synoptical account of the plants of their native country. In this undertaking he deserves and will undoubtedly receive the support of the botanists of the United States.

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