

While the practical results of the season's work have been to more firmly strengthen the contentions of the United States, the scientific results have been more than expected. The observations of Mr. Clark, while throwing much light on the problem of early starvation of young, have also done much to explain the manner in which harems are formed and the massing of seals in particular spots when there is plenty of room and often better ground close at hand.

The noticeable scarcity of three-year old females indicates the truth of the supposition that the death rate is high, this being the only class whose abundance or scarcity could well be noted, owing to the great similarity in the appearance of the older seals. On only one point did the results of this year's observations differ materially from those of last year, and this is in respect to the cause of death among young seals. The conclusion reached last year that the great majority of deaths among the pups was due to their being trampled on by the old seals is found to be erroneous and that the mortality is caused by a parasite, a species of *Uncinaria*, found in the small intestine. This course of danger was pointed out by Dr. Stiles as a result of the examination of a very few specimens obtained in 1896, and the matter will be discussed at length later. It may be said that young seals—and they alone seem to be affected—dying from an attack of *Uncinaria* perish so quickly that they lose little of their fat and that the disease is practically over before the end of August.

Finally, the past summer was unusually dry and clear, these conditions greatly facilitating the work of the party from the U. S. Coast Survey which is engaged in making a careful survey of the islands and especially of the breeding grounds.

F. A. L.

A BOTANICAL EXCURSION TO MEXICO.

MEXICO is a profitable place for the botanist to visit on account of the richness of the flora, numerically speaking, and because of the assemblage in one geographical region of many species peculiar to a certain physical or meteorological zone. The aquatic flora, the Alpine flora, the desert and tropical floras, are all found associated within a radius of a few miles. Altitude and the distribution of the rainfall explain this somewhat interesting feature of the flora. The problems presented to the botanist for solution are very intricate, and it is necessary for him in order to solve the more difficult questions to spend considerable time in the field where the plants are to be found surrounded by natural conditions.

Each of the plant communities into which the flora of a country as vast as Mexico can be divided can be distinguished by the component plants which, together by their collective features, give character to the vegetation of a particular meteorological, geological or physical region of the earth's surface. Such a flora as the Mexican can be classified into several ecological* communities, as follows:

1. Hydrophytic Community, composed of Hydrophytes, or water-plants.
2. Xerophytic Community, composed of Xerophytes, or desert-plants.
3. Halophytic Community, composed of salt-loving plants.
4. Mesophytic Community, including those plants found in intermediate situations, such as plants of the tropical forests, palm forests, bamboo thickets, temperate deciduous forests, subtropical evergreen forests and plants of the Arctic, Alpine and prairie regions.

The valley of Mexico is especially suited

* Ecology is the study of plants with reference to their environmental conditions and covers the field of the so-called biology of plants.

to ecological inquiries. It is an elevated circular valley, closed in by two distinct ranges of hills, the oldest porphyritic rocks to the north and east, which before volcanic disturbances began sloped gradually southward toward the Isthmus, and the newer volcanic mountains to the south and west built up in a later period and closing off to the south and east the gradually sloping plain, thus forming the basin-shaped plateau known as the Valley of Mexico. Ajusco, the oldest volcanic peak, stands like a sentinel on the southern rim of the basin, and from its summit to the base of the valley extends a lava bed known locally as the Pedregal. On the southeast rim of the valley rises the ice-capped peak of Popocatepetl (17,780 feet), and to the eastward, connected with the conical volcano, the ridged backbone of Iztaccihuatl, also snow-capped, considered by geologists to be built of the older porphyritic rocks. Along the base of the eastern range three fresh-water lakes, Texcoco, Chalco and Xochimilcho, are found, while the partially drained basin of lake Texcoco forms an alkaline plain stretching along the Mexican railroad to the hills which jut southward into the plain at Guadalupe.

The lakes and communicating ditches furnish the hydrophytes, the alpine summits of Popocatepetl, Iztaccihuatl and Ajusco (13,612 feet) the alpine plants; the lava beds afford a large number of xerophytes, while the alkali plain near lake Texcoco grows a number of halophytes which reach their greatest numerical development on the Gulf coast. The rich agricultural soil of the valley grows a varied and luxuriant series of mesophytes. It presents in its constricted area a veritable botanical garden, right at the doors of the population of the capital.

Space will not permit a detailed account of the plants found growing in the different vegetable zones. Only one or two plants

can be taken by way of illustration. The xerophytes show very thick leaves, thick cuticle and a hairy or spiny covering, and are usually consolidated in structure. The plants are peculiarly constructed so as to store water by means of certain mucilaginous substances which absorb moisture and hold it tenaciously, giving it off very slowly to the air. The Agave, Maguey or Century-plant, commonly found cultivated on the plateau of Anahuac, is a typical xerophyte. It is to be seen growing wild in desert places and on lava beds, and grows in one or two forms to a large size (eight feet), weighing sometimes 600 to 800 pounds. It is a plant of considerable pharmaceutical interest. It stores up in its tissues a surprising amount of a sugary water, which exudes when the plant is tapped, as the so-called honey water or aguamiel. This aguamiel when fermented yields the beverage called pulqué, which is consumed in large quantities by the poorer Mexicans, who pay una cuartilla (3 cents Mexican, $1\frac{1}{2}$ cents American) for a glass of this yeasty-tasting alcoholic drink. It is obtained from the plant in the following way: When the Agave, which yields the liquid honey water, reaches adult size, turns slightly yellow and begins to shoot up a flower stock, or before that time, it is tapped by hollowing out a concavity in the core of the plant at the base of the central leaves, which stand upright and are not yet fully expanded. The pulqué-gatherer, with a long hollow gourd pierced at both ends, draws the aguamiel by suction from the concave place as it wells up from beneath. He is clad in cheap cotton clothes and wears a hide apron fastened around his waist and a thick leather knee pad on his left leg. Then pressing the spiny leaves aside with his left knee, he pushes one end of his gourd with his right hand into the tapped place and draws upon the other end with his mouth, until he has filled the

gourd with maguey liquid. He then transfers it to a vessel made of pottery reinforced by wicker work, or, as is the usual custom, he pours it into a vessel made of a hogskin. When his skin vessel is full he carries it to the shed, where for 36 hours the Agave juice is allowed to ferment, changing during this process from a yellowish-looking fluid to a milk-white, yeasty-looking fluid. It is a very refreshing and wholesome drink for those high altitudes, if taken in moderation. Drunkenness is the result of its too free use. It is laxative, and is reputed to be antiscorbutic, and through its assisting digestion quiets the heart's action. The best pulqué is obtained in country places, the writer finding its use refreshing and cooling, the city pulqué being inferior to that of the suburban towns, being watery and sour. Pulqué keeps its freshness but a day, when it begins to sour. The sour liquid is distilled and yields according to the process used two or three powerful alcohol drinks, mezcal, tequila and aguardiente de maguey. There are two or three beverages or soft drinks in use, one made from the pineapple and called piño, and another tepache might be termed sugar-cane cider. The latter drink, as a rule, is to be had along most of the country roads running from Mexico. The mezcal, tequila and aguardiente are very powerful in their effects. A Mexican Indian addicted to their use can drink a glass of any one of the three without effect; two or three glasses will set him demoniacally crazy.

The alpine flora is interesting on account of the dwarf, cespitose habit of the plants, their hairy covering and brilliantly colored flowers. The plants of this region are mostly perennial, very few annual plants being found in this zone. The lake flora is interesting, as the plants are distributed in the ditches and along the borders of the lagoons and lakes. *Eichornia crassipes*, the water hyacinth, *Marsilia heterophylla*, *Rup-*

piá, *Asparagus Escobeda linearis*, *Polygonum amphibium*, *Nymphaea mexicana*, *Lobelia splendens*, and a water lily with white flowers and large leaves, are a few of the plants of the hydrophytic community.

The Chinampas, or floating gardens, are in lakes Chalco and Xochimilcho. At one time they really did float, but now they are anchored to the bottom by the roots of trees and form little patches of garden ground, separated by narrow canals. Here are grown flowers and vegetables for the city market. The canoes of the Indians bring the produce to the city by the Viga Canal, where it is sold along the banks of the canal, or in the markets, the principal one of which is called the Volador, south of the National Palace and occupying a site that was included in the grounds of the 'new house' of Montezuma, and, therefore, after the Conquest was a part of the property of Cortez. Here are sold all manner of fruits and vegetables, apples, peaches, pears, pomegranates, mammees, figs, bananas, tunas, quinces, tomatoes, corn, beans and other agricultural products. The meat and poultry stalls are equally important, but it is to the sellers of herbs that a druggist would turn with most interest.

An old Indian woman, knitting or sewing, occupies a seat in an enclosed stall, surrounded on all sides by dried herbs and medicinal plants. For a small sum of money she will prescribe for all the ailments to which the flesh is heir, drawing upon her supplies of drugs hanging about the stall. These substances are compounded into medicine, according to her directions, and it seems that the peons have faith in her skill, for numbers of them were seen around the stall asking medical advice. Casually, while inspecting the market, hasty notes were made of a few of the remedies which composed her stock of drugs. There were panicles of *Sambucus mexicana*, dried flowers of *Datura arborea*, dried plants of

Achillea millefolia, a few *Mammillarias*, tops of *Datura* with stems and pods, dried gourds, bunches of unknown herbs wrapped in corn husk, bunches of the pepper tree (*Schinus molle*), bunches of dried roots, sea beans (*Mucuna*), hoofs of a deer, ears of a donkey dried, stuffed birds, carapace of a turtle, dried alligator with skin removed, armadillo skins and other remedies too numerous to mention. I returned again and again to this market and always found it a source of information and amusement.

Mexico is a very rich and virgin field for ecological study and is yet an unworked field. Similar observations in other regions have been made by Dr. Eugene Warming, of the University of Copenhagen, several years ago in Venezuela; at Lagoa Santa, by Dr. Scott, who explored the Cape region of South Africa, in the Kalahari desert; by Professor Stahl in Java, and last year in Mexico; and by Professor Trelease, of the Missouri Botanical Garden, on the Yuccas of the southwestern United States and northern Mexico.

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BOTANY AT THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION G organized on Monday, August 9th, at 12 m., with about 18 persons in attendance, the Vice-President and Secretary both being in their places. After the election of 3 fellows to serve on the Sectional Committee further elections were postponed till the following morning, when the full organization was completed. The attendance on the meetings ran up each day to about 50, except during the Vice-Presidential address, when the room was crowded with about 150 people. The list of new officers elected for the Section is found elsewhere in this JOURNAL, and need not be repeated here.

Two invitations given to the Section were

quite generally accepted by its members; the one being to a visit of inspection to the immense pharmaceutical laboratory of Parke, Davis & Co., in Detroit; the other being to a trolley ride and entertainment by Mr. Joseph Berry, of Grosse Pointe, where the fine grounds, extensive gardens and conservatories were greatly enjoyed.

During its session the Section was honored with a brief visit from Professor H. Marshall Ward, of Cambridge University, England.

The papers read numbered a total of 26. Several of the older botanists usually in attendance at the meetings of the Association were absent, and there was, therefore, a predominance of younger members; the quality of papers was, however, good, the most of them being narrative of original research on the part of their authors.

The preliminary program has already been published in SCIENCE (pp. 222-223 above), and the following papers were subsequently entered:

'On a New and Improved Self-Registering Balance,' by Dr. Alex. P. Anderson.

'The Correlation of Growth under the Influence of Injuries,' by Dr. C. O. Townsend.

'The Botanical Collection of the Cornell Arctic Expedition of 1896,' by Professor W. W. Rowlee and K. M. Wiegand. [Read by title.]

'Description of *Bacillus Phaseoli* n. sp., with some Remarks on Related Species,' by Dr. Erwin F. Smith.

'On the Nature of Certain Pigments produced by Fungi and Bacteria, with special reference to that produced by *Bacillus solanacearum*,' by Dr. Erwin F. Smith.

Since the address of the Vice-President on 'Experimental Morphology' has been published in full in this JOURNAL, comment need not be given here, except to say that the address, illustrated by lantern-slides was a collaboration of results of many botanists in experimental morphology, and was full of suggestion for future research in this direction.

Professor Davis' paper on the variation of