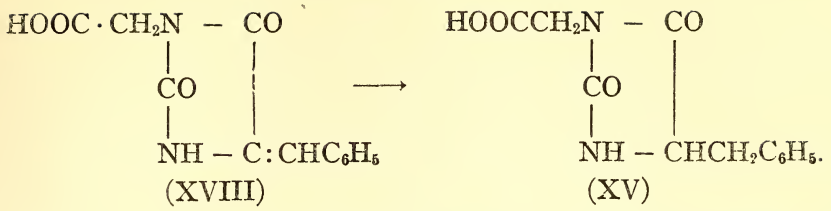

(XVIII) (XV)

Other methods for synthesizing hydantoin compounds of this type (and their sulphur analogues) are being developed. This work will include not only the study of hydantoin derivatives of dipeptides but also tripeptide combinations of analogous constitution, and also an investigation of their behavior towards hydrolytic agents and enzymes.

[1] Mörner, *Zs. physiol. Chem.*, 34, 207 (1901).

[2] Lippich, *Ibid.*, 90, 441 (1914).

[3] Wheeler and Hoffman, *Amer. Chem. J.*, 45, 368 (1911).

[4] Ruhemann and Cunnington, *London, J. Chem. Soc.*, 75, 958 (1899); Ruhemann and Stapleton, *Ibid.*, 77, 246 (1900); Wheeler and Hoffman, *loc. cit.*

RECENT EXPLORATIONS IN THE CACTUS DESERTS OF SOUTH AMERICA

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When the cactus investigation for the Carnegie Institution of Washington was taken up a few years ago with Dr. N. L. Britton, a definite plan for field work in the deserts of North and South America was outlined. And since the Cactus family is confined to America, this meant a survey of its entire distribution.

The exploration of the deserts of South America was referred to me, and I have spent two seasons in exploring these regions; the first on the west coast, in Peru, Bolivia, and Chile, and the second on the east coast, in Brazil and Argentina. The exploration was confined chiefly to the deserts, as the cacti as a class are desert loving plants. A cactus desert, however, does not necessarily mean a desert like the Sahara or the desert of Arizona.

We found as a result of our investigation that South America contains six great cactus regions: (1) The desert of northern South America, including northern Venezuela and Colombia. This region we have not yet studied at first hand. (2) The great Peruvian and Chilean desert which extends from northern Peru to central Chile and from the Pacific Ocean to the top of the Andes, having a length of 2000 miles and a breadth of 50 to 300 miles. (3) The desert of Argentina, extending from the central part of Patagonia along the east side of the Andes well into Bolivia.

It resembles in its component parts the desert of Arizona. (4) The semi-arid region of eastern central Brazil, including most of Bahia and Pernambuco. It is very similar to the desert region of Santo Domingo and the typical genera are nearly all West Indian. (5) The desert of southern Brazil. This region we have not yet studied. (6) The states of Rio de Janeiro and São Paulo and the southern part of Minas Geraes, Brazil.

The last region is one of abundant rainfall and where all ordinary cacti would be killed. Here, however, the cacti not only grow on rocky knobs and along the beaches, but especially on the trunks of trees. Under the last named condition these plants find the same zerophytic conditions that their relatives find which grow in New Mexico and western Texas. They attach their roots to the bark of trees, their stems are reduced to long, shoe-string-like bodies, while the spines are reduced to hairs or they disappear altogether. About 40 of these epiphytic species, mostly belonging to the genus Rhipsalis, have developed in this region and they represent a most interesting group.

We have made large collections in South America in the fields visited; and we have ascertained that many species of cacti had never before been collected, and that many of those which had been collected had been poorly described and often wrongly classified.

ON THE ALBEDO OF THE PLANETS AND THEIR SATELLITES

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1. The most suitable definition of albedo for astronomical purposes appears to be that proposed by Bond[1] in 1861, namely, the ratio of the whole amount of light reflected in all directions from a sphere illuminated by parallel rays to the amount of light incident on the sphere.

2. The albedo A of any planet, according to this definition, is the product of two factors, one of which depends only on the size of the planet, its distances from the earth and sun, and its brightness at the full phase, while the other depends upon the way in which the brightness varies at different phases. The first factor, which may be called p, can be calculated from known data for all the planets. Its value depends mainly upon the material of the surface, being high if this is nearly white, and low if it is dark colored. The second factor, q, can be computed only when the planet is observable over a considerable range of phase, so that the law of variation of its brightness with phase can be determined, and its values are known only for the moon and the planets