more careful scientific study of the question, especially in hospitals.

Laboratory methods to explain the inner processes in disease have been applied to hospital patients for twenty years or more in Germany but in the United States little has been done in this regard. If such investigations are in any way promoted by their discussion here, this writing will not have been in vain.

In the second edition the scope of the book has not been changed, but advances that have been made during the past three years are included.

W. D. Bigelow

REPORT ON NEW ZEALAND SAND DUNES

The New Zealand Department of Lands has recently published a paper, by Dr. L. Cockayne, entitled "Report on the Sand Dunes of New Zealand" which treats of the geology and botany of the sand dunes and their economic bearing.

The first part of the article deals, in a general way, with the damage done by dunes, the objects of dune culture or reclamation and the description and acreage of the principal dune areas.

The dune question is attacked geologically in the second part of the paper. Here are discussed the origin of dune material; dune building, and the effects of various factors on the processes of dune formation and movement; and the various land forms of the dune area.

In treating the botanical features of the New Zealand dunes, in the third part, Dr. Cockayne sets forth the ecological factors governing their flora, and describes the most characteristic plants of the region and their "adaptations." He divides the plant life of the dunes into three groups, namely, sand binders, sand collectors and wet-ground plants. The methods of spreading of dune plants are also discussed. The subject of dune-plant associations is confined to dunes of western Wellington, though the author states that these may be taken as typical of those of the central floristic province of New Zealand. It is shown that each stage in the evolution of the dune possesses its characteristic plant association and also that "the plant-covering is an exact index of the wind force."

Among the important conclusions drawn by the author, the following may be mentioned:

It is useless to attempt artificial planting on many wandering dunes without shelter of the proper kind.

The neglect of wounds in the turf of stable dunes is perhaps the greatest source of danger to the adjacent fertile lands.

Under certain conditions a dune exposed to wind-tearing action may be naturally covered with shrubs and rendered stable without any previous preparation, except such shelter as is afforded by sand grass (*Spinifex hirsutus*).

In selecting shelter-plants for dune-afforestation purposes, tolerance of drifting sand is a matter of prime importance, without which drought or salt-resisting power are as nothing.

The paper is admirably illustrated by thirty-five excellent photographs and concludes with the citation of one hundred and thirteen works consulted in its preparation.

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SPECIAL ARTICLES

ON THE CONSERVATION OF HAILSTONES AND THE INVESTIGATION OF THEIR MICROSTRUCTURE

The investigation of microstructure of hailstones being till now very difficult if not impossible in summer, I constructed an apparatus (Fig. 1) for their conservation till winter-time. It consists of three coaxial cylinders; the inner space is intended for hail, the middle space for a mixture of ice and cupric sulfate (approximatively in proportion corresponding to eutectics, $t = -1°.6$), the outer space for ice, which forms a sort of guard-mantle.

During the summers 1908 and 1909 I had only once the chance of meeting a hail-storm —the 2/15 August, 1909, when I was at sea near Helsingfors on my way from Aland to St. Petersburg. This hail lasted from three to four minutes, the hailstones were very small