TREES AND PLANTS OF SOUTHERN CALIFORNIA.

BY PROF. CHARLES F. HOLDER.

The cacti of Southern California are equally striking. Here all the choice hothouse specimens of the East are seen out-of-doors, standing the occasional cold winter nights without perceptible effect, and giving the impression that the cold is not so severe as it seems. In Fig. 1 a California cacti garden is shown, similar to several in Pasadena, Coronado, and Los Angeles. Here is the huge candle cactus so common on the Mexican and Arizonian deserts, and many more affecting curious and grotesque shapes; but the common cactus of the country is the *Opuntia*, or prickly pear (Fig. 2), of which there are one hundred and fifty species. One large form, called the tuna, may be seen growing effectively near San Gabriel. The leaves are enormous, and the plant is sixteen or seventeen feet in height. This cactus was planted as a hedge around the old mission of San Gabriel, described by the writer in a previous number of the SCIENTIFIC AMERICAN. The cacti are not beautiful in themselves, but they add to the attractions of the landscape, and in many localities on the mainland and on the islands off shore there are veritable forests of cactus, which in the spring are a mass of yellow bloom. The fruit of the purple prickly pear is sometimes eaten; it makes very fair wine and jelly, and has various economic values. The interesting feature of the cacti lies in their blossoms, which are often remarkable in color, perfume, and shape. Of all the family the Rainbow Cactus—*Candicans*—is most striking, each plant bearing eight or nine blossoms, four or five inches across—a veritable blaze of color. *Dasyacanthus*, covered with gray spines, a hideous object, has a splendid large flower, red and vivid yellow. *Pectinatus* has large pink blossoms four inches across.

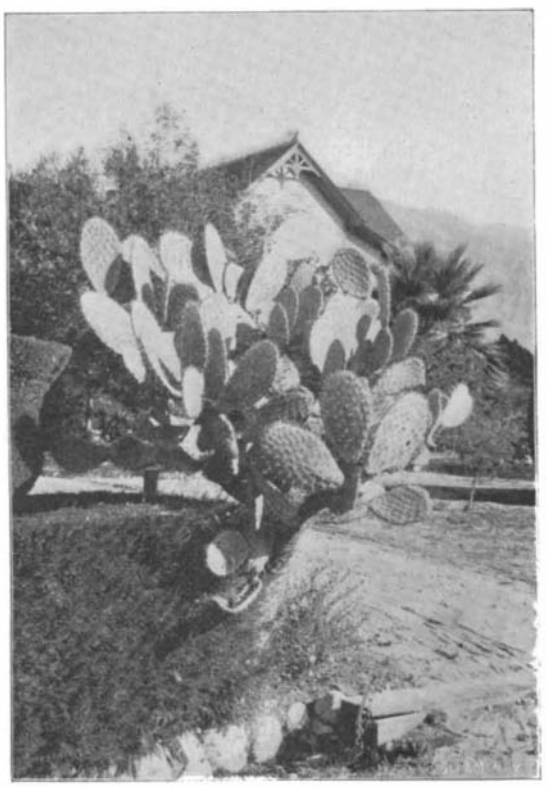

Fig. 2.—PRICKLY PEAR, OPUNTIA.

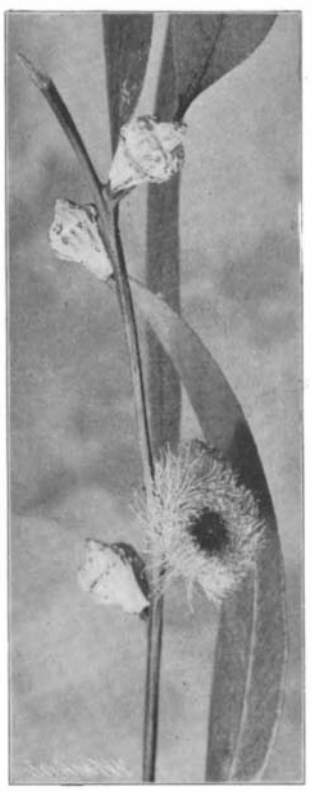

Fig. 3.—EUCALYPTUS BLOSSOM.

Fig. 4.—PEPPER TREE.

Australia has contributed to the adornment of Southern California mesas. Fifty years ago the table lands were either barren, or had here and there groves of live oaks; but now valleys like the San Gabriel appear dotted with forests in geometrical lines and squares. These trees, tall, plume-like and of showy mien, are eucalypti from Australia, among the most valuable importations, as they are very rapid growers, and when cut grow again from the stump; when large they are magnificent specimens of trees. These trees are employed to line avenues, to form windbreaks; they produce oil and kino, and are extremely valuable in reclaiming waste or damp places. The eucalyptus was introduced into California by the Hon. Ellwood Cooper, of Santa Barbara; and many of the one hundred and fifty species are to be found in the State to-day. The blue gum, the common form of Los Angeles, Pasadena, and other places, is one of the tallest of trees, and some noble specimens are known. One in Tasmania has been measured and found to be three hundred and thirty feet tall; and it is claimed that four hundred feet has been attained. From the seed the eucalyptus will attain twenty-five feet in eighteen months. An eight-year-old tree at Kinneloa, near Pasadena, measured seventy-one feet in height. In Fig. 3 the ecualyptus blossom is seen. It represents the famous Magnolia Drive at Riverside, with eucalyptus trees in the center and upon the left. The tree which possibly attracts more attention in California than any other is the pepper (Fig. 4), with its beautiful lacelike mass of foliage and clusters of vivid red berries. The pepper makes an effective shade, and is the characteristic tree of Pasadena, Los Angeles, and Riverside.

Marengo Avenue, in Pasadena, is particularly noted for its interlocking pepper trees, which, growing on either side, meet, forming a perfect arch for a mile or so. The tree is a rapid grower, and under favorable conditions attains a large size. This pepper is the *Schinus molle* of botanists, and was probably brought to California from South America. A pleasant fiction, which is sometimes explained to tourists, is that it is the tree from which pepper comes; but it is needless to say that the name arises from the pungent, peppery odor of the red berries or drupes.

The enigma of the Californian climate is still further emphasized by the banana, which is seen in many sections. It attains large size and beauty, especially the Abyssinian varieties; but they do not come to perfect fruition. The guava, tamarind, orange, lemon, lime, grape fruit, loquat, alligator pear and a score of others grow here, illustrating the possibility of tropical vegetation in a semi-tropic climate.

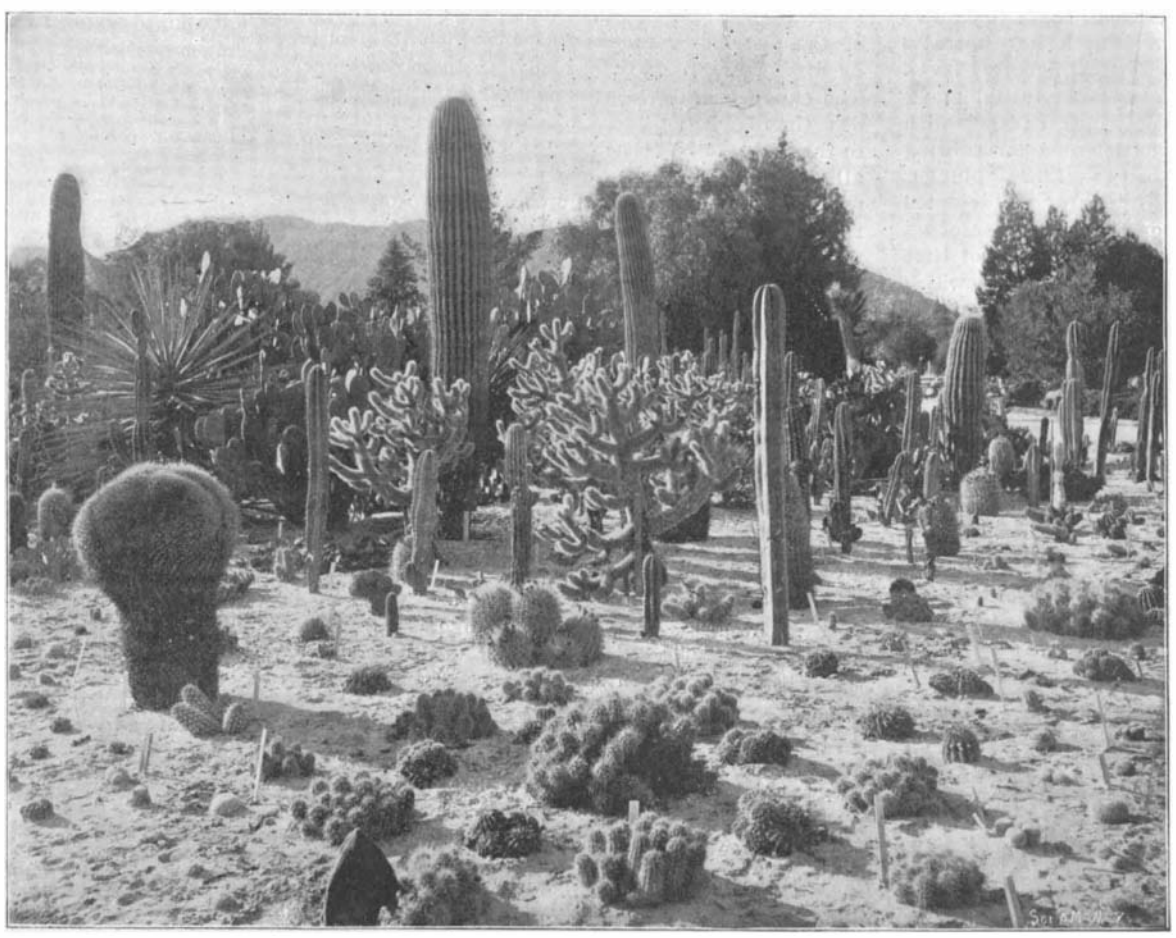

Fig. 1.—CALIFORNIAN CACTI GARDEN.

Change of Color Observed in Shrimp.

Two English scientists, Messrs. Gamble and Keeble, have lately published an account of the change of color produced in the case of a variety of shrimp, known as the *Hippolyte varians*, which lives among the seaweed along the borders of the coast. It has been already observed that some of the shrimps change their color according to the locality in which they live. The authors have made a careful study of the subject, and have prepared a series of colored plates which show the different colors of the shrimp and the seaweed; thus on brown seaweed a brownish color is assumed, often streaked with small lines which imitate in a striking manner the structure of the plant. On the zosteres a green color is taken, and in each case the coincidence of color is well marked. The authors find that if a shrimp which has adapted itself to a certain color is transferred to another, the corresponding color-change is not immediate; if, for example, the shrimp adapted to green seaweed is changed to brown, it keeps its original green color for more than a week, and at the end of that time only some of the individuals have changed their color to brown. Thus, although the color of the substratum acts upon the animal the change is slow and uncertain, which shows that the individuals which are adapted to a certain type of plant must have lived upon this from an early age and could hardly change their locality without danger. The color of the hippolyte is modified rapidly and surely when the light is made to change in intensity, but at equal intensities monochromatic light seems to have no influence upon them. Another point observed by the authors is that the hippolyte, and probably other crustaceans such as the mysis and pandalus, give singular periodic changes of color. At 9 o'clock in summer and 5 o'clock in winter the diurnal tint changes little by little and in about one hour arrives at an intense azure blue, accompanied by an almost entire transparence of the body. It seems that the hippolyte has acquired the habit of this change, for if it is kept continuously for 24 or 48 hours in either a dim or a lighted aquarium, it none the less assumes the dark color when night approaches outside. The experiments made as to the effect of a longer time have not yet been fully realized, but the present facts remain unchanged. The movements of the chromatophores are without doubt directed by the nervous system, as has been shown, among others, by Pouchet. When the light changes in quality or intensity the starting point of the action seems to be the optical center, but the periodic change of color has its origin, not in the eyes or the optical ganglia, but in the rest of the nervous system.

It is proposed to illuminate the Yosemite Falls, 2,600 feet in height, by the use of twenty arc lights in connection with means for producing color effects. Some of the roads are also to be lighted with electricity.