

AQUATIC PLANTS OF SAN DIEGO.

DURING the wet spring of 1884 I had an excellent opportunity to note the aquatic flora of this vicinity. Doubtless it seldom reaches such luxuriance; and in some years, owing to the scarcity of water, many of the plants certainly make no appearance.

Surface-water reached an exceedingly low stage in 1883; and San Diego was supposed remarkably free from any water-plants, except the wide-spread *Azolla*, and a few other well-known species. However, the heavy rains of 1884, flooding the entire country, revealed a surprisingly large variety; and that, too, where one would least expect it,—on the broad, usually dry and barren mesas.

The surface-geology of large portions of these mesas is characterized by innumerable hillocks, or small mound-like formations, rising from one to four feet above the intervening depressions, and ranging from ten to fifty feet in diameter. They are generally nearly circular, though often irregular; and the depressions contain in stony places accumulations of cobblestones.

These innumerable hollows naturally become miniature lagoons as soon as heavy rains commence; and soon the leaves of *Callitriche* are floating upon their surface, while the deeper portions of the little lakes are lined upon the bottom with large patches of *Pilularia Americana*, *Tillaea angustifolia* (Nutt.), and *Elatine*; and along the borders are other minute plants which altogether form a tangled mat of miniature luxuriance, exceeding in comparison the vegetation of the largest lakes. Some of the larger pools, longer covered with water, are filled along the edges with *junci*, sedges and grasses, among which, at the bottom, *Isoetes* thrives as well as in the northern lakes.

Later in the season, *Downingia pulchella* and *Pogogyne nudiuscula*, with several less conspicuous species, border the pools; and still later a new golden *Bloomeria*, blue *Brodiaeas*, and other beautiful *Liliaceae*, are found; and these, in turn, give way to a few *Compositae*, preceding the next dry season.

This year another plant, *Marsilia vestita*, common to lagoons at high altitudes, and also *Ammannia latifolia* (L.) and *Echinodius rostratus* (Engelm.), grew abundantly in this vicinity, on the borders of a usually dry flat, near the level of the sea. Other aquatics were found in great quantity throughout the country; and nearly two dozen species of common water-plants, previously unknown to this section, were added to the local flora. C. R. ORCUTT.

SUNLIGHT AND THE EARTH'S ATMOSPHERE.¹

THERE is, we may remember, a passage in which Plato inquires what would be the thoughts of a man who, having lived from infancy under the roof of a cavern, where the light outside was inferred only by its shadows, was brought for the first time into the full splendors of the sun. We may have enjoyed the metaphor without thinking that it has any physical application to ourselves, who appear to have no roof over our heads, and to see the sun's face daily; while the fact is, that if we do not see that we have a roof over our heads in our atmosphere, and do not think of it as one, it is because it seems so transparent and colorless.

Now, I wish to ask your attention to-night to considerations in some degree novel, which appear to me to show that it is not transparent, as it appears, and that this seeming colorlessness is a sort of delusion of our senses, owing to which we have never in all our lives seen the true color of the sun, which is in reality blue rather than white, as it looks; so that this air all about and above us is acting like a colored glass roof over our heads, or a sort of optical sieve, holding back the excess of blue in the original sunlight, and letting only the white sift down to us. I will first ask you, then, to consider that this seeming colorlessness of the air may be a delusion of our senses, due to habit, which has never given us any thing else to compare it with.

If that cave had been lit by sunshine coming through a reddish glass in its roof, would the perpetual dweller in it ever have had an idea but that the sun was red? How is he to know that the glass is 'colored,' if he has never in his life any thing to compare it with? How can he have any idea but that this is the sum of all the sun's radiations (corresponding to our idea of white or colorless light)? Will not the habit of his life confirm him in the idea that the sun is red? and will he not think that there is no color in the glass, so long as he cannot go outside to see? Has this any suggestion for us, who have none of us ever been outside our crystal roof to see? We must all acknowledge in the abstract, that habit is equally strong in us, whether we dwell in a cave or under the sky; that what we have thought from infancy will probably appear the sole possible explanation; and that, if we want to break its chain, we should put ourselves, at least in imagination, under conditions where it no longer binds us.

The Challenger has dredged from the bottom of the ocean fishes which live habitually at great depths, and whose enormous eyes tell of the correspondingly faint light which must have descended to them through the seemingly transparent water. It will not be so futile a speculation as it may at first seem, to put ourselves in imagination in the condition of creatures under the sea, and ask what the sun may appear to be to them; for, if the fish who had never

¹ A lecture delivered at the Royal Institution, April 17, 1885, by Prof. S. P. LANGLEY of Alleghany. From advance sheets of *Nature*, kindly furnished by the editor.