

all prostrated. *Mimosa* of various kinds, also flowering, and the more tender palms, were borne down and broken. Pelargoniums and other succulent shrubs destructively crushed. Partial thaw in the sunshine.

March 8.—Th. min. 27°·7, max. 51°·3; bar. 28·83. Sunshine in morning began a thaw, but only to discover mischief done by the frost. Wind first from N.E.; in p.m. from S.W., increasing thaw.

March 9.—Th. min. 35°, max. 51°; bar. 29·67. Rain in night and most of day, but later turned to snow in large flakes. Wind S.E.

March 10.—Th. min. 27°, max. 44°; bar. 28·88. Fresh snow in night to depth of 4 or 5 inches. Whole country white, including Esterel Mountains, on which snow is hardly ever seen. Wind W., rising, threatening a mistral. Only two small spots on the sun.

March 11.—Th. min. 24°·1, max. 45°; bar. 28·84. Bright morning, but intense cold with mistral, at night destroyed almost all tender plants and shrubs in garden, in spite of covering. One fine young indiarubber-tree of 15 feet, with its rich green and bronze leaves, turned in the night to a spectre of limp black rags. Wind W., calm. Only one small spot on S.E. border of sun.

March 12.—Th. min. 25°·7, max. 49°; bar. 28·90. Sun bright, but hard frost everywhere except in sheltered places. Wind W. strong. Four spots now visible on sun, one larger than the rest, and near it a large oval facula of brighter light.

March 13.—Th. min. 32°·1, max. 49°·6; bar. 29·30. Weather bright, wind W., moderate. Two of the four spots larger, with deeper umbrae; suspicion of a facula near one.

March 14.—Th. min. 29°, max. 54° (?); bar. 29·50. Sky bright, some haze, wind W. Four sunspots, less marked, varying from day to day; one, which was a penumbral streak, now hardly visible.

March 15.—Th. min. 32°, max. 50°·4; bar. 29·30. Weather feels much warmer, wind W.S.W.; one of the sunspots much larger, with a rent of dark umbra within.

March 16.—Th. min. 36°·7, max. 50°·3; bar. 29·19. Weather fine, a little haze, wind W.S.W. Now five spots; two large, with dark irregular centre and fringe of penumbra; two dark, without fringe; one a mere streak of penumbra.

March 17.—Th. min. 41°·9, max. 52°·2; bar. 29·22. Fine in morning, but hazy; later, clouds from S.W. (showing rain-band) gathered, and brought first hail, then rain for two or three hours; later, the sun appeared with one of the new spots much enlarged, consisting of a penumbra with two distinct dark clefts within.

March 18.—Th. min. 35°·1, max. 53°·9; bar. 29·48. Bright morning, with haze, wind S.S.W. No change in sunspots.

March 19.—Th. min. 45°·9, max. 52°·5; bar. 29·20. Morning gloomy, with clouds and rain. The wave of cold seems to have passed, but not so the vast deposits of snow left on the mountains behind, and still less the unknown detriment inflicted on vegetable life in the olive and orange groves around us.

The foregoing observations are too few and too imperfect to warrant any decided conclusions, but they add to those already made in evidence of the connection between the absence of sunspots and the diminution of terrestrial heat; and I trust they may be followed by further and more exact investigations to determine the influence of our great luminary on the weather and climate of the world. How far this "cold wave" has extended to other countries and latitudes I am not informed; but it seems to me that their usually cloudless skies bring the shores of the Riviera into closer and more direct relationship with sun-power than other countries, and therefore render them more sensitive to its variations.

C. J. B. WILLIAMS

Cannes, March 19

### Mr. Grant Allen's Article on "The Shapes of Leaves"

THE article by Mr. Grant Allen on "The Shapes of Leaves," published in NATURE (vol. xxvii, p. 439) as first of a series, calls for an emphatic protest on behalf of botanists, and especially of teachers of botany.

In his introductory paragraphs he at once cuts the Gordian knot of vegetable physiology in a most startling manner. He tells us that "from the free carbon thus obtained [*i.e.* by deoxidation of carbonic acid], together with the hydrogen liberated from the water in the sea, the plant manufactures the hydrocarbons which form the mass of its various tissues." If he had

only substituted, by a slip of the pen, the term hydrocarbon for carbohydrate, it might have been regarded as a pardonable piece of negligence; but, since he speaks of "free carbon" and *hydrogen*, he shows that he really meant to write the word "hydrocarbons." Naturally he does not bring forward the results of any experiments which may have led him to make this extraordinary statement.

He goes on to say: "Vegetal life in the true or green plants consists merely in such deoxidation of carbonic acid and water, and arrangement of their atoms in new forms." Among other strange conclusions to be drawn from the above lines we see that, according to Mr. Grant Allen, either nitrogen does not enter into the composition of proteids, or that the latter have nothing to do with that "vegetal life" of which he speaks.

Articles containing blunders of such magnitude, but written with that assurance of style which naturally carries conviction to the mind of the unwary, and disseminated through the country in a widely read journal like NATURE, cannot but produce a rich crop of erroneous impressions. These it will be the arduous duty of teachers to eradicate.

Every one will agree that the popular writer must, before all things, be master at least of the first rudiments of the subject on which he writes: Mr. Grant Allen has in two consecutive sentences shown himself singularly deficient in this respect.

It would be premature here to enter upon a detailed criticism of these articles, since the series is not yet complete. But the two sentences I have quoted are so strangely heterodox that they could not be passed over without remark.

F. O. BOWER

As I do not think it necessary to preface four short papers on the shapes of leaves with a formal treatise on physiological botany, I am not careful to answer Mr. Bower in this matter. The word hydrocarbons was used deliberately, because the important point to notice is this—that the plant consists in the main of relatively deoxidised materials. From the point of view of energy, with which one has to deal mainly in treating of functions of leaves, that fact is of capital importance. I can conscientiously inform Mr. Bower that I was aware of the chemical constitution of proteids, and of the part which they bear in life generally; but I do not see what harm can be done to anybody by such a confessedly rough statement as that which he criticises. If we must always step aside to say all that we know about any subject whenever we have to deal with it, exposition of new matter becomes impossible. May I call Mr. Bower's attention to the further fact that in the same paper I spoke of the plant catching "fragments of carbon," meaning thereby not free carbon, but carbon in the form of carbonic acid, even though it be merely reduced from carbon dioxide to carbon oxide. It seems to me that such roughly accurate language is permissible in popular writing, where one's main object is to insist only on the general principle involved. It is the carbon that the leaf wants, not the oxygen; it is the carbon and the hydrogen that it deals with, not the nitrogen, which is but the instrument for dealing with them; and the two other elements may therefore be safely neglected. Or must we drag in sulphur, and potassium, and calcium, and all the rest as well?

GRANT ALLEN

### Ticks

IF W. E. L. will acquaint himself with the somewhat scattered literature of this subject he will find that much useful information has already been placed on record by entomologists and others. The *Farm Journal* for July 10, 1880, contains a sensible and convincing article by Mr. James Elliot, showing the connection between ticks and louping-ill. A good article on the sheep-tick (falsely so called, since it is an insect and not one of the Ixodidae) occurs in *The Field* for April 26, 1873. The scientific aspects of the subject are well treated of by Mégnin, especially in relation to classification in his "Monographie de la Tribu des Sarcoptides Psoriques," 1877. Mr. Hulme's edition of Moquin-Tandon's "Elements of Medical Zoology" has a useful chapter on ticks (p. 302). Some valuable hints are given in Prof. Verrill's Report on parasites to the Connecticut Board of Agriculture, 1870. An excellent article with good figures on *Melophagus ovinus* appeared in one of the volumes of the *Intellectual Observer*. The ticks of the sheep and stag are both figured in Van Beneden's "Animal Parasites" (English edition of International Series, p. 177). The sheep-tick is likewise figured and described in the "Micrographic Dictionary." References and