

Porto Rico; I believe even Barbados comes to Porto Rico for cattle.

The island is very richly endowed by nature, but miserably governed, and the people themselves not worth a much better government, being given to gambling in the extreme throughout, thus squandering away every dollar, from the rich planter and priest down to the lowest labourer and beggar. Yet they are hospitable and very polite to strangers, with that remarkable, unchanging, inbred Spanish politeness.

It may finally interest you to hear, from the fact that you take a prominent part in the advancement of the material progress of the English West India Islands, how we are working in that respect here in St. Thomas.

I have on my estate now about 4000 Divi-Divi trees growing and doing well, except for the deer, which do much damage. On the coasts I have over 2000 coconut trees planted; cultivation of the *Sansevieria guineensis* is going on for making fibres; a large tract of land stocked with *Hæmatoxylon* I have now preserved, and try to make it a regular forest, to be cut down gradually.

In company with an engineer here I have now ordered a machine from England, Smith's fibre machine, which is being used in the Mauritius, in order to work up our immense quantity of *Agave* and *Fourcroya*, the raw material being close at hand in unlimited quantity near the sea.

I have published a couple of articles on the material resources of these islands in one of the largest Danish newspapers, of which I beg to send you a copy, in order to make private persons and Government move. Among the former a good many have started on, but, as you may perhaps have heard, governments are sometimes slow in moving, representing, as they do eminently, that great law of nature, *vis inertia*.

However, so far, and considering the short space of time, I am very well satisfied. I think there is a fair chance now of the West Indies in general entering upon a new prosperous career.

I am also going to try experiments with the manufacture of tannin extracts from bark of *Coccoloba*, *Rhizophora*, and the pods of the various Acacias, which are a great nuisance here on account of their rapid growth.

The *Aloe sempervirens* will also be made useful in a similar manner as in Barbados and Curaçoa, it growing here spontaneously on barren rocks. H. EGGERS

THE REMARKABLE SUNSETS

UNDER the headings of "Cloud-Glow" and "Optical Phenomena" we have published several letters already on the recent remarkable sunsets; we have received many others, the most important of which we bring together here:—

PERHAPS it will interest you and your readers to hear that the phenomenon called "cloud-glow" in your last numbers, was seen also at Berlin on the three evenings of November 28, 29, and 30. As far as I could overlook the sky, the details were almost the same as your correspondents describe them: A greenish sunset at 3.50, an unusually bright red sky with flashes of light starting from south-west. An interesting physiological phenomenon which we call "Contrast-Farben," was there beautifully illustrated by some clouds, no longer reached by direct sunlight; they looked intensely green on the red sky. At 4.30 the streets were lighted by a peculiarly pale glare, as if seen through a yellow glass. Then darkness followed, and the stars became visible. But half an hour afterwards, at 5 o'clock, the western sky was again coloured by a pink or crimson glow. Persons who were not quite sure about its direction mistook it for a Polar aurora; others spoke of a great fire in the neighbourhood. If atmospheric refraction could be neglected, the matter

(whatever it may be) thus illuminated by the sun one hour after sunset and 45° above the horizon, would be found to be at a height of about forty miles! At 6 o'clock all was over. The first day (November 28) this glow was still stranger, because the lower western sky was covered by a large, dark cumulus-cloud; but besides this the three remarkable evening skies were quite like each other. ROBERT VON HELMHOLTZ
N.W. Berlin, Neue Wilhelmstrasse 16, December 1

P.S.—To-day it rains; nevertheless an unusual brightness was to be seen in the west till 7 o'clock, which perhaps may be attributed to the same "glow."—R. v. H.

THE red glow described by your correspondents continued to be visible here every evening until yesterday (2nd inst.), and there was another fine display of *rayons du crépuscule*. Is not "cloud-glow" a misnomer as applied to what is seen in perfection only when there are no clouds, and is invisible when the clouds are thick? "After-glow" is too comprehensive an expression, as it embraces the usual effects of a brilliant sunset, and too limited, as it could not be applied to the phenomenon as recently seen before sunrise. In the absence of a scientific title for something which has been but little investigated, might not the name "upper-glow" be adopted, in contrast to the under-glow which is the predominant feature of ordinary effective sunsets. The red colour of the reflected light is in both cases I suppose equally due to diffraction, particles suspended in the air obstructing the rays of least wave-length. But in the "upper-glow" the reflecting matter is at a great height above the cloud-level, in the "under-glow" it consists of the lower surface of the clouds themselves. ANNIE LEY

December 3

Erratum.—In the first paragraph of my letter of the 27th ult. (p. 103) 2600 should be 26,000.

THE following extracts from my observations at York may assist in determining the cause of the extraordinary series of sunrise and sunset effects during the past month:—November 24: Unusual cloud tinge in morning. November 25: Similar effect in morning. From 2.45 to 3 p.m., blue sky from 10° to 25° or 30° from the sun, of a delicate rose pink. This noticed by several, when asked to say if they saw anything peculiar. It gave a greenish-gray cast to cirro-cumuli through which it was seen. Round the sun the sky looked yellowish. 5.30 p.m., "the west ruddy as from glare of fire;" not entirely gone till 6. Time of local sunset 3.38, calculated from almanac and observed sunrise on 28th.

A letter from my father, Street, Somerset, 26th, evening, speaks of "a wide arc above the sunset lit up with the most glorious pink shade. The clouds low in the horizon a stone-gray; but the most remarkable of all was a longish cloud to the north of sunset and above and beyond the circle of pink; that was a bright sage green. I never before saw such a colour in any cloud. . . . Later, rays shot up from the sun like the rays of aurora."

28th: Same pink halo at noon. Cloud-glare on morning of 26th and 27th; to-day, about 6 a.m. (sun rose at York 8.0, set 3.35). Sunset most striking; pink above, orange lower at 4.20; grass appeared of brownish sage green. At 5 p.m. lit up all over like red aurora. 29th: Same red glare, like that of a fire, at 6.20 a.m. Glare gone by 6.35; cirri in east-south-east lit up by 6.45. True sunrise glow 7.10; orange at base turned to yellow-green at 7.25, and cirri again black; relit at 7.35, with rosy tinge. Sun seen to rise clear of horizon at 8.2; Jupiter visible among faint haze until 8.13. 9.45 a.m., rosy glow round sun; 4.30 p.m., a fading ordinary sunset; 4.45, glare reappearing; 5 p.m., "finer than ever," as observed by Mrs. Clark. December 3: Remarkable lurid effects, 4.30 to 5.0 p.m. Letters from Street and Birmingham mention similar effects on the 28th and 29th. A para-