

Alaska, and the personal experience to which he refers, to avail himself of the observations of another in a different though adjoining region? We are of course aware that a considerable similarity exists as between the manners and customs of the various Indians of the north-west coast; but to transplant observations made in one specific district bodily to another is a proceeding utterly repugnant to any one with a regard for scientific precision — or truth.

GEORGE M. DAWSON.

Geological survey of Canada,
Ottawa, Nov. 27.

The best reply to make to a criticism like Mr. Dawson's is to let a few facts bearing on the case speak for themselves. Let me take the case of complaint cited by him, — the rotten fish and roe feast. In 1865-66, twelve and thirteen years before he knew any thing about the subject, I witnessed and smelled my boat's crew of Haida and Stickeen Indians open and eat rotten salmon and herring roe, and rancid fetid Aalachan fat, at a dozen different camping-places between Stickeen Mouth, Alaska, and Port Essington, B.C. My notes and drawings were made then, which appear in my recently published work. These notes and drawings were re-written and selected, and all in the hands of my publisher Feb. 26, 1886. I never saw Mr. Dawson's work, or even knew of it, until the middle of April, 1886; then my attention was called to it by Professor Mason, who has the only copy known to this establishment. He, at that time being at work on a collection just received from British Columbia, incidentally alluded to it, and, finding I had never seen it, asked me to read it.

'Our arctic province' was not written for the eye or ear of scientific specialists: were it so conceived, its covers could not be expanded wide enough to embrace the subject; and it would, if so written, be an utter failure as a popular and pleasant book to handle on the question. Hence all this detail, controversy, and citation has been justly eliminated from it.

HENRY W. ELLIOTT.

Smithsonian institution, Dec. 10.

Star rays.

In the oldest pictures in which the sun, or stars, or burning candles, are features, these objects are represented as surrounded with rays, or points, or brushes of light; and the conventional figure of a star is to-day a pentagon, with its sides extended to an intersection so as to form five pointed projections. It is evident that this manner of representing luminous bodies is due to the fact that such appendages have their counterparts, to a greater or less degree of correspondence, upon the retina of the eye, when such bodies are viewed. But it has never been supposed by any one that such points or rays were actual emanations of luminous matter from the objects, nor the converging of their light into these forms by the atmospheric medium through which they are viewed. Such impressions have always been considered so simple and constant as not to deserve any notice on the part of scientific inquirers, as far as I have ever heard; and it is because my curiosity has been excited to know their cause, that I appeal to the readers of *Science* for more light upon the subject.

In the case of the electric light, now so common in

our streets, I have been able to account for the principal feature of their apparent radiations. The very long rays, which, if the carbon points were at the same distance as is the sun, would be many millions of miles long, I find are nothing more than the reflection of the light from my eyelashes; as is proved by the fact of their changing their position to correspond with every change I make in the position of my eyelashes, and of their total disappearance when I intercept the light by my fingers or other screen. But I cannot by any practical means thus get rid of the great body of minor rays which seem to interlace with each other, and which sparkle with the prismatic colors. The experiment with the longer ones, however, forces upon me the conclusion that these are due to some other part of my optic apparatus which is out of my reach.

I have also gazed upon the full moon, and, while doing so, have at different times, and with different conditions of the eyes, and with different positions of the eyelids, observed with great distinctness nearly every form that I have seen published, representing the solar corona as observed by the astronomers during an eclipse of the sun, and especially those rifts in the corona which extend to the very surface of the luminous orb, — features which, in the case of the sun, utterly disprove every hypothesis that has been advanced to account for the existence of the corona.

If the corona is an emanation from the general surface of the sun, or the illumination of a circumambient atmosphere of matter, how are we to account for these rifts, which imply immense long and narrow vistas, following great circles of the sphere, which constantly shift their position on its surface so as to coincide with the line of view of the observer on the earth, through all the movements of solar rotations and of the earth in its orbit?

Mr. Proctor suggests that the corona is the more highly illuminated centre of an hypothetical stratum of stellar substance, to which the orbits of the earth and other planets are confined, and which gives out the zodiacal light. If this were so, those immensely long projections should radiate from the equatorial zone of the sun. But the zone from which they project is always perpendicular to the line of view of the observer.

What quality can be assigned to a homogeneous atmosphere, either upon the moon or the earth, which is capable of perverting the light of the sun into such fantastic shapes as have been observed, and what can induce such changes in that quality to correspond to the manifold changes in the forms recorded?

Considering the complete failure of every hypothesis to account for the phenomenon, and during the pause which seems to have overtaken this inquiry, may it not be excusable for those who are ignorant to inquire whether sufficient attention has been given to the possible effects of the structure of the lenses and tubes of the telescopes through which the observations have been made, and whether it may not be possible to abolish the corona in the same way that the 'black drop' has been abolished? If reflections from my eyelashes and eyelids can produce such figures upon the retina, may not reflections from the tubes or other parts of the telescope produce them upon the photographic plate?

RD. RANDOLPH.

Baltimore, Md., Dec. 10.