

Pseudaurora Borealis; or, What was It?

THE observations which I am about to recount may not be new to others, but, as I have failed to see or hear of any such after several years' waiting, I communicate mine, hoping that by doing so I may call them out if there are any. The business portions of Minneapolis, Minn., had for many years been lighted by the Brush system of electricity, during which time that method of street illumination had been extended considerably in all directions, leaving, however, much more that continued to be lighted by gas and oil. I had occasion to visit the suburbs of the city under circumstances which delayed my return until a very late hour, and for a considerable portion of my way the latter method of lighting prevailed. On passing into the electrically-lighted section, my attention was arrested by the appearance of the aurora borealis, or northern lights.

It being in the month of February, and their appearance at that season by no means a rare event, while the lateness of the hour, and the severity of the cold, with the air so filled with frost as to give an appearance of a light fog, I was hastening forward as rapidly as I could on foot, when I noticed that the aurora had disappeared, but after a few steps more it reappeared. Pausing a moment, I saw there was no mistaking the fact of my seeing a genuine display of northern lights, I again went forward with the same experience of interruption. This circumstance awakened a suspicion that the phenomena were in some way to be accounted for by the presence of the electric lights, and, after another brief pause to make myself assured of the certainty of my observations, I went back along the way I had come until fully out of the zone of the Brush lights, and well into that of the gas-lamps, where I found no signs of an aurora.

Returning slowly towards and into the former illumination, all of the observations were repeated precisely as at first, until having passed a given burner, when the phenomena again ceased. After repeatedly changing my position in relation to a special burner in a northern and southern direction, during which I discovered that the phenomena was most distinct when I was observing them at or about the angle of 60° to the burner, a corresponding movement east and west gave no more facts, and after once more noting the characteristic movements of the serrated columns of partially prismatic radiations of the auroral beams along the penumbrated arc, I went on my way resolved to keep a good outlook for another such observation, but it has never come after nearly five years of waiting. If others have noticed the same, or similar phenomena, it will be gratifying, and in order, for them to say so.

P. L. NATCH, M.D.

Anacortes, Washington, Nov. 3.

The Humming-Bird's Food.

FOR three years I have made a special study of the habits of the yellow-bellied, or sap-sucking woodpecker (*Sphyrapicus varius*), as found in the White Mountains of New Hampshire. The birds arrive in that region near the middle or 20th of April, and remain until about the middle of October. During the whole of this period they derive the more important part of their food-supply from sap-yielding holes which they drill through the bark of red maples, red oaks, poplars, white and gray birches, the white ash and some other trees and shrubs. In every instance where I have found a well-marked drinking-place established by the sap-suckers, humming-birds have been regular attendants upon it during the summer months.

I have paid hundreds of visits to these "orchards" of the sap-suckers, and have watched them for many hours at a time. By so doing I have ascertained that, as a rule, one individual humming-bird seems to acquire a sort of easement in the sap-fountains of the woodpeckers, and if another ruby-throat attempts to drink sap at his spring, violent resistance is offered.

The humming birds, at "orchards" where they are not molested by the woodpeckers, drink scores of times in the course of the long summer day. When not drinking they are usually perched on twigs a few yards from the holes, keeping their nervous heads wagging from side to side while watching for intruders. In a

few instances I have seen humming-birds perch upon the bark below the holes in order to drink long without being forced to keep their wings moving while enjoying the sweet sap.

In some cases I have placed small birch-bark cups upon trees frequented by the sap-suckers and their guests, and in each such instance the humming-birds have been as quick as the woodpeckers to discover the diluted maple syrup with which the cups were filled, and to drink it in considerable quantities. I remember seeing one drink for sixty seconds, with a ten seconds' rest in the middle of the minute.

Most of the "orchards" at which I have seen humming-birds as visitors from year to year have been composed of red maples or gray birches. At one of the birch orchards I shot two humming-birds, a male and a female, in order to ascertain whether more of their kind were visiting the holes. Only nine minutes elapsed before another was at the holes drinking.

FRANK BOLLES.

Cambridge, Nov. 28.

Sense of Direction.

SOME time in the fifties, in Oregon, a party of prospectors took a mule team, wagon, and camping equipage on a prospecting tour. In order to be correct in their local geography, and to retrace their steps should they find anything worthy of a re-visit, they took a civil engineer along, who took the bearing of every course and the distance was chained.

When they gave up the prospecting enterprise, their route had been so tortuous that they decided to take the direct route for the home camp. The engineer footed up the latitudes and departures of the courses run, and made a calculation of the course home, and all struck for the home camp. When they reached the end of their course, night had overtaken them, and they found themselves, not in the home camp, but in the woods, with no objects or land-marks that any of the party could recognize.

As the engineer took no "back-sights," or check bearings, he said that local attraction somewhere in their journey had thrown him off a little and that they were in the neighborhood of the home camp. At this, the driver turned one of his mules loose, which went directly to the camp, about three-quarters of a mile distant. As the mules were not allowed to run at large, for fear of wandering off or being stolen by Indians, this mule had never before been over that route, and must have had a sense of direction. It was a joke on the engineer which he did not relish, though it had great "staying qualities."

JOHN T. CAMPBELL.

Rockville, Ind., Nov. 14.

Electrical Phenomena on the Mountains of Colorado.

IN *Science* for Sept. 23, Mr. O. C. Chariton describes a mountain experience, and inquires if it is common or dangerous.

The peculiar buzzing and crackling sound, the standing of the hair on end, etc., are extremely common on the mountains of Colorado. The prospectors, miners, and drivers of pack trains to the high mines (above 11,000 feet) live in the midst of these electrical phenomena, and often find much amusement in observing their effect on the average "tenderfoot," especially when lady tourists, as not seldom happens, find their long hair slip from the fastenings and stand up like the fabled head-dress of the Furies. I have repeatedly heard the sounds at elevations between 6,000 and 7,000 feet, but they are much more noticeable at higher elevations, where they are sometimes terrific. They sometimes mark the tension of the air just preceding a discharge of lightning, but in general they are harmless. I have many times noticed them proceeding with hardly any interruption while the lightning was leaping from cloud to cloud overhead. They are caused by the passage of an electrified cloud, and the effect is rather worse when one is in the midst of the cloud. On these mountains the manifestation of intense electrical phenomena is seldom seen except when there is hail or pellet snow, or the most violent summer showers; and the latter usually have hail in some part of the storm. The loudest buzzings I have ever heard came while a

hail-storm was approaching and while the peculiar shelf or cornice which projects from the base of the storm-mass was in the zenith. This shelf has a flattish and rather smooth surface on its under side and when seen from a distance appears to consist of a mass of cloud having an under-pavement of low domes or flattish billows, and the broader and more peaceful it looks, the worse is the wrath of the storm above and within it. Lightning seldom comes from it, yet it is in a state of intense electrical excitement. While it is passing, there is a loud hissing from stretched wires (not connected with the earth), a stream of sparks, and at night a glow like St. Elmo's fire. A herd of cattle can sometimes be seen in the darkest night by their own light.

The fact is, the physiological effects of electric induction are so common in the higher mountains, and are often so ludicrous, that we are in danger of throwing aside these phenomena as of no special scientific interest. Yet we here have a complex problem involving not only the electrified clouds and the air as dielectric, but also the electrical properties of the ground itself. Now many of the prospectors for metalliferous veins declare that the behavior of lightning on veins containing certain kinds of ores differs from the ordinary. Some of them profess to be able to know the nature of the minerals in a mountain by observing the buzzing and other phenomena on the passage of electric clouds, but it is difficult to get them to talk about it, as they appear to regard the matter as a trade secret. Even experienced prospectors leave a certain peak on the approach of severe thunder storms, they declaring their sensations of shock to be unendurable, even when the lightning does not strike the mountain. They report that stones are loosened from the cliffs and fall in dangerous fusillades down the mountain side. No doubt these are in part land-slides, but some of them are reported to take place when no rain fell, only snow or hail, or before the rain reached the place. My informants used this language: "The mountain split and threw off those rocks." I have been desirous of determining the truth of these matters by personal observation, but thus far have not found the opportunity. It is at least a supposable case that electric attraction or repulsion dislodges blocks already loosened. Have any of your readers made observations on these matters pertaining to the effects of different kinds of rocks or minerals on electric clouds, or vice versa?

Perhaps a nearly related problem is furnished by the causes (electrical or otherwise) of the restlessness and often sleeplessness and oppressed breathing that accompanies the warm westerly or Chinook winds over the mountains.

GEO. H. STONE.

Colorado Springs, Oct. 24.

The Gil'a Monster.

THERE has been considerable discussion as to the poisonous character of this lizard, and of late it seems to be accepted that it is not poisonous by the scientific people from the fact that the animal has no poison-sack or fangs, this does not by any means settle the question, for many of us know by personal experience that it is poisonous, and very much so at times. There are several people almost every year in Arizona and elsewhere who either lose their lives by it or suffer intolerable agony from it, and the notion that it is not poisonous does not lessen the number of sufferers. If the animal is in its normal condition and bites a person, no harm usually comes from it. It is a very pugnacious animal and is easily excited to frenzy, and especially so when it is being captured alive; at such times it emits a yellow and very rank-smelling saliva, which, if it enters the circulation by a wound or otherwise, produces death or great suffering in human beings. One case that came under my observation was that of a young man, in Arizona, who was bitten under those circumstances and who was sick for several months and had the disintegration of the blood and the effusion of serum that so frequently occur in those suffering from a rattlesnake's bite. I have no doubt that this explanation accounts for the poisoning of people by other "non-poisonous" lizards of our arid region. I should not be at all surprised to hear that even the horned toad that the boys so delight to torment is also poisonous under such circumstances.

MARCUS E. JONES.

Salt Lake City, Nov. 10.

Grand-Gulf Formation.

I AM glad to see that Judge Johnson accepts my determination of the brackish water character of the fauna of his Pascagoula clays, as it is a matter of some importance in the genesis of the tertiary strata of the Gulf border; and I am not disposed to quarrel with him if he chooses to retain the term "formation" for them provided it is made clear exactly what he understands by that term. His original communication was somewhat obscure on both these points and by placing a species of *Venus* in the bed (which is a strictly marine genus) I was led to suppose that he regarded the bed as (not deep sea but) purely of salt water origin.

In saying that I have permitted "conjecture" "to outrun and forestall positive discovery" in my brochure of January last, Judge Johnson simply indicates that he is not aware of the material in my possession and which though published (for the most part) during the last ten days, has been nearly two years in manuscript awaiting the printer's opportunity.

My short paper on the Pliocene of the Carolinas gave merely a tabular view of the results to which seven years of field-work and study of the material collected by numerous other workers in the field had led me. This may be found substantiated in Bulletin 84 of the Geological Survey just printed, but the portion relating to Florida had been type-written for the use of Messrs. Eldridge and Jussen before they entered upon their field-work, and it is, therefore, not exact to state that the differences between the older and the newer Miocene were "established" by those gentlemen, who had the essential solution of this question in their hands to begin with, Mr. Jussen having devoted under my direction some time to the study of the Old Miocene fauna of the Chipola beds before he entered the field at all.

Hasty generalization and hasty writing of all sorts are "baneful" I willingly admit, and an excellent example of what is to be avoided by lack of haste is shown by Judge Johnson himself in the letter alluded to (p. 247).

I have nowhere asserted that the Pascagoula clays are of Chesapeake age. As a matter of fact, they have nearly the whole of the Grand Gulf series between them and the Chesapeake formation. Judge Johnson's Waldo formation comprised beds belonging to two different epochs, the typical locality at Waldo, from his own specimens, being Chesapeake, and other localities mentioned by him, in his definition of the formation, are Old Miocene. I do not know what he refers to by the expression "overlying clays" at Aspalaga on the Appalachicola River, and certainly have never "shown" them to "be Chesapeake." Aspalaga lies in the region of the oldest Old Miocene, the fossils which I have seen from there are those solely of the Chattahoochee group. On the other hand, the Miocene discovered by Johnson at De Funiak Springs and eastward to Abe's Springs on the Chipola River is not the Older Miocene but the Chesapeake, with a typical Chesapeake fauna so far as yet developed. Still further, the Chattahoochee beds of Langdon distinctly underlie the Chipola beds, so far as they have yet been identified, and the fauna, while related to that of Chipola proper, is not the same.

In short, the Miocene limestones of Florida are so closely similar that the only way of identifying them (short of continuously tracing the beds, which is for the most part impracticable in Florida) is by their fossil contents, which can only be adequately studied in what Judge Johnson calls the "closet," that is to say, a museum supplied with the literature and specimens for comparison.

As the Grand Gulf lies probably above both the Older and the Chesapeake Miocene, I fail to see how the water-bearing sands at its base can serve to discriminate or define the distinction between the two older formations. Some part of the Grand Gulf is very likely contemporaneous with part of the later Miocene, but as yet information is absolutely deficient on this point. What we have called the "upper bed" at Alum Bluff, or the "Ecphora bed" of my Bulletin 84, is typical Chesapeake Miocene, identical with that at Waldo so far as its fossils are concerned. Lithologically, the beds are quite different. As for the Hawthorne and Ocheese beds, both contain fossils, and we have fossils from the former collected by Judge Johnson himself. For details, the enquiring reader is referred to Bulletin 84, above mentioned.