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 physiolgical 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 fusilades 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 Gila 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 Aspalåga on the Appalachicola River, and certainly have never "shown" them to "be Chesapeake." Aspalåga 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 Ocheesee 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.