LETTERS TO THE EDITOR.

**** *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

Dr. A. Graham Bell's Studies on the Deaf.

CALLING a statement a mistake does not make it one. Permit me to respond briefly to what are called my mistakes:—

1. The statement (p. 85) which Dr. Bell denies, was accompanied by reference to the authority for my quotation. It was taken from the *British Medical Journal* of May 11, 1889, a reputable English periodical, and has since been quoted in the *British Quarterly Review of Deaf Mute Education.* My responsibility ceases upon the production of such evidence. The misstatement cannot, by the wildest liberty of imagination, properly be called mine.

2. The so-called mistakes in the final paragraph (p. 119) can easily be detected, if they exist, for the official sources of information are given. The papers presented to the British House of Commons on deaf-mute matters contain a report from the United States, dated Oct. 5, 1886 (pp. 51–55).

In June, 1884, at a convention of oral teachers held in New York City, of which Dr. Bell was permanent chairman, F. H. Wines, Esq., the special census officer in charge of statistics of this character, said, "There must be in the United States, I think, not less than five thousand children, who are of proper age to attend school, who have never seen the inside of any institution" (*Official Report of Convention,* p. 5). Several months later, at the Gallaudet Centennial in Philadelphia, Dr. Bell used the following language: "In 1880, with all our magnificent institutions, and with all our beneficence, we still had fifteen thousand children of school age in the country; and in all our institutions and schools put together there were only a little over five thousand, and many of these were over the school age" (*Silent World,* Philadelphia; and *Dr. Bell's Speech at Gallaudet Conference of Principals,* p. 16). These two extracts and the "Report to the British House of Commons" are sufficient evidence of the correctness of my final paragraph (p. 119).

3. I am also condemned for not giving the statement of what the theory of a deaf-mute race is. It ought to be remembered that the article on "Scientific Testimony," reprinted in your columns, appeared originally in the *American Annals of the Deaf.* The readers of that journal are perfectly familiar with what the theory of a deaf-mute race is, and the statement of it there would be altogether unnecessary. It was Dr. Bell himself who first suggested the printing of this article in *Science;* and it is difficult to understand how he can now turn upon the writer, and condemn what he is himself responsible for, so far as the wider publicity of the article is concerned.

4. But the *gravamen* of my offence, "the climax of my numerous mistakes," as Dr. Bell terms it, is that I have attributed the theory of a deaf-mute race to him. It would certainly be inexcusable in a teacher of the Hartford school not to know that Rev. William Turner first suggested this theory, if such a teacher could be found. Does the doctor really believe that it is the culmination of my errors that I did not charge him with borrowing this theory? I have nowhere said he originated it. According to this rule, we must never speak of the Darwinian theory, for it is well known that it had already been suggested long before it had been elaborated by Darwin. Theories take the names of their most illustrious expounders. It was in this sense, without the least suspicion of an invidious suggestion, that I, in common with the press and the colloquial habit of the country, spoke of Professor Bell's theory of a deaf-mute race. I confess to a considerable degree of mortification in finding myself obliged to deal with matters of so trivial a character as the charges this letter contains; but, when the head and front of my offending turns upon so minute a point as the proper designation of a theory which has been presented to the public by Professor Bell, I may well feel some degree of satisfaction with the real question of which these side issues are mere cobwebs. I hope to be able in a few weeks to present a few thoughts on hereditary deafness; but I shall not again reply to charges of misstatements, unless I have been guilty of some inadvertence which does injustice.

Rev. W. G. JENKINS.

Hartford, Conn., Sept. 8.

I HAVE read the review of the "Facts and Opinions" respecting the deaf, published by Mr. A. Graham Bell, which appeared in your issue of Aug. 15. The reviewer, Mr. W. G. Jenkins of Hartford, quotes my opinion as to the cause of deafness, which is characteristic of many batrachians, which was, that it is due to disuse which follows the absence of sound in the subterranean and subaquatic region which they inhabit. The reviewer then goes on to point out that there is no analogy between such animals and the deaf-mutes among mankind, who live, like their fellowmen, in the midst of sounds.

Mr. Jenkins has overlooked the questions put by Mr. Bell, and hence has missed the significance of the answer, in my case at least. The first question was whether it was thought probable that a race of human deaf-mutes could be established. My reply was that I thought that such a race could be established. My reasons were, first, the analogy of the batrachians and other *Vertebrata;* and, second, the probability that by continuous intermarriage such a peculiarity could become established as congenital. I did not offer any opinion as to how the deafness might originate in mankind; for on this subject I had, and have now, no sufficient information. As to the question of the transmittal of such a character, your readers are referred to my essay on "Inheritance in Evolution," which appeared in the *American Naturalist* for December, 1889.

E. D. COPE.

Philadelphia, Sept. 5.

The "Barking Sands" of the Hawaiian Islands.

ABOUT a year ago *Nature* printed my letter from Cairo, giving a condensed account of an examination of the Mountain of the Bell (*Jebel Nagous*) on the Gulf of Suez, and of the acoustic phenomenon from which it is named. In continuation of my researches on sonorous sand, which are conducted jointly with Dr. Alexis A. Julien of New York, I have now visited the so called "barking sands" on the island of Kauai. These are mentioned in the works of several travellers (Bates, Frink, Bird, Nordhoff, and others), and have a world-wide fame as a natural curiosity; but the printed accounts are rather meagre in details, and show their authors to have been unacquainted with similar phenomena elsewhere.

On the south coast of Kauai, in the district of Mana, sand-dunes attaining a height of over one hundred feet extend for a mile or more nearly parallel to the sea, and cover hundreds of acres with the water worn and wind-blown fragments of shells and coral. The dunes are terminated on the west by bold cliffs (*Pali*) whose base is washed by the sea; at the east end the range terminates in a dune more symmetrical in shape than the majority, having on the land side the appearance of a broadened truncated cone. The sands on the top and on the landward slope of this dune (being about 100 yards from the sea) possess remarkable acoustic properties, likened to the bark of a dog. The dune has a maximum height of 108 feet, but the slope of sonorous sand is only 60 feet above the level field on which it is encroaching. At its steepest part, the angle being quite uniformly 31°, the sand has a notable mobility when perfectly dry; and on disturbing its equilibrium it rolls in wavelets down the incline, emitting at the same time a deep bass note of a tremulous character. My companion thought the sound resembled the hum of a buzz saw in a planing-mill. A vibration is sometimes perceived in the hands or feet of the person moving the sand. The magnitude of the sound is dependent upon the quantity of sand moved, and probably to a certain extent upon the temperature. The dryer the sand, the greater the amount possessing mobility, and the louder the sound. At the time of my visit the sand was dry to the depth of four or five inches. Its temperature three inches beneath the surface was 87° F., that of the air being 83° in the shade (4.30 P.M.).

When a large mass of sand was moved downward, I heard the sound at a distance of 105 feet from the base, a light wind blowing at right angles to the direction. On one occasion horses standing close to the base were disturbed by the rumbling sound. When the sand is clapped between the hands, a slight hoot like sound is heard; but a louder sound is produced by confining it in a bag, dividing the contents into two parts and bringing them together violently. This I had found to be the best way of testing seashore sand as to its sonorousness. The sand on the top of the dune is wind-furrowed, and generally coarser than that of the slope of 31°; but this also yielded a sound of unmistakable character when so tested. A bag full of sand will preserve its power for some time, especially if not too frequently manipulated. A creeping vine with a blue or purple blossom (*kolokolo*) thrives on these dunes, and interrupts the sounding slope. I found the main slope 120 feet long at its base; but the places not covered by this vine gave sounds at intervals 160 paces westward. At 94 paces further the sand was non-sonorous.

The native Hawaiians call this place *Nohili*, a word of no specific meaning, and attribute the sound caused by the sand to the spirits of the dead (*uhane*), who grumble at being disturbed; sand-dunes being commonly used for burial-places, especially in early times, as bleached skeletons and well-preserved skulls at several places abundantly show.

Sand of similar properties is reported to occur at *Haula*, about three miles east of Koloa, Kauai. This I did not visit, but, prompted by information communicated by the Hon. Vladimar Knudsen of Waiawa, I crossed the channel to the little-visited island of Niihau. On the western coast of this islet, at a place called *Kaluakahua*, sonorous sand occurs on the land side of a dune about 100 feet high, and at several points for 600 to 800 feet along the coast. On the chief slope, 36 feet high, the sand has the same mobility, lies at the same angle, and gives when disturbed the same note as the sand of Kauai, but less strong, the slope being so much lower. This locality has been known to the residents of the island for many years, but has never before been announced in print. This range of dunes, driven before the high winds, is advancing southward, and has already covered the road formerly skirting the coast.

The observations made at these places are of especial interest, because they confirm views already advanced by Dr. Julien and myself with regard to the identity of the phenomena on sea-beaches and on hill-sides in arid regions (*Jebel Nagous*, *Rig-i-Rawan*, etc.). The sand of the Hawaiian Islands possesses the acoustic properties of both classes of places; it gives out the same note as that of Jebel Nagous when rolling down the slope, and it yields a peculiar hoot-like sound when struck together in a bag, like the sands of Eigg, of Manchester (Mass.), and other sea-beaches,—a property that the sand of Jebel Nagous does not possess. These Hawaiian sands also show how completely independent of material is the acoustic quality, for they are wholly carbonate of lime, whereas sonorous sands of all other localities known to us (now over one hundred in number) are silicious, being either pure silex or a mixture of the same with silicates, as felspar.

The theory proposed by Dr. Julien and myself to explain the sonorousness has been editorially noticed in *Nature*, but may properly be briefly stated in this connection. We believe the sonorousness in sands of sea-beaches and of deserts to be connected with thin pellicles or films of air, or of gases thence derived, deposited and condensed upon the surface of the sand-grains during gradual evaporation after wetting by the seas, lakes, or rains. By virtue of these films the sand-grains become separated by elastic cushions of condensed gases, capable of considerable vibration, and whose thickness we have approximately determined. The extent of the vibrations, and the volume and pitch of the sounds thereby produced after any quick disturbance of the sand, we also find to be largely dependent upon the forms, structures, and surfaces of the sand-grains, and especially upon their purity, or freedom from fine silt or dust ("Proceedings American Association for the Advancement of Science," 38, 1889).

I should be lacking in courtesy if I closed this letter without expressing my great obligations to Mr. H. P. Faye of Mana, and to Mr. George S. Gay of Niihau, for both a generous hospitality and a sympathetic assistance in carrying out my investigations.

H. CARRINGTON BOLTON.

Honolulu, H.I., May 26.

BOOK-REVIEWS.

Civil Government in the United States considered with Some Reference to its Origins. By JOHN FISKE. New York, Houghton, Mifflin, & Co. 12°. $1.

THIS is not such a work as we expected from Mr. Fiske. We thought when we took it up that we should find it a philosophical treatise on the nature and functions of government, but that is just what it is not. The author does, indeed, ask what government is, but dismisses the question in a single sentence; there is nothing in the book about the nature and uses of law; and the ethical principles that lie at the basis of civil society are never once alluded to. The work is purely descriptive and historical, and treats, not of government, but of governmental machinery only. Moreover, one-half the book is devoted to municipal government,—to the town, the city, and the county,—the city alone receiving as much attention as the State. But such a mode of treatment magnifies the work of the municipalities out of all proportion to its importance. The essential element in our political system is the State, and the municipalities are merely agencies of the State for certain administrative purposes.

But though we cannot agree with Mr. Fiske's conception of his subject, yet the work he has actually done is well done. He has given a description of the various agencies of government in the United States which is both accurate and clear, and in a smaller space than we should have thought possible. The book also conveys a good deal of interesting historical information, especially in the part devoted to the town and the county. Questions for pupils, and suggestions for teachers, adapt the work for use in schools; and its value is increased by an appendix containing the Articles of Confederation, the National Constitution, a translation of the Great Charter of King John, and other interesting documents.

Die Furcht. Von A. MOSSO. Aus dem Italienischen übersetzt von W. Finger. Deutsche Original-Ausgabe, mit 7 Holzschmitten und 2 Lichtdruck-Tafeln. Leipzig, Verlag von S Hirzel. 1889.

THERE are two classes of scientific men. To the one class belong the enthusiastic, absorbed searchers after truth, who are driven by an inborn impulse to grapple with Nature, and who find their highest happiness in wresting her secrets from her. They are unfortunately in the minority, for they are the pioneers of science. The other class are many, and range in culture from learned men down to those who read for the sake of a subject to talk about. The purpose of the work and study of the latter is social influence. Both classes are useful, the second acting as the interpreter of the truths which the former have extorted from nature.

It is seldom that the scientific investigator has personally the time and the necessary contact with the masses of the people to enable him to popularize his own observations and experiments. Mosso, however, has undertaken the task with Italian geniality. The charm of his book is that he is himself so enthusiastic in and enraptured by his scientific work that he must seek to interest others also. He says of it, "It is a work full of patience. The only difficulty consists in gradually learning to understand Nature's speech; to find ways and means of questioning her, and compelling her to answer us. In this struggle in which we, modest pygmies, are continually striving to grasp the secret of life, there are delightful moments, lights and shadows, which excite the imagination of scientist and artist."

His enthusiasm does not cause him to forget that he is writing for the people as well as for his colleagues in science. Though his language is as free of technical terms as possible, the work is pregnant with scientific observations and experiments, chiefly the result of his own study, some of them as yet unpublished. The chapters in which he describes the pulsations of the blood in the