with this view, the glacial map of Asia which precedes the chapter is covered with extensive glaciated areas over the regions which I have specifically visited. All of which shows the confusion of mind which has widely prevailed up to the present time concerning the glacial conditions of Southern Siberia and Central Asia, and goes to justify the editor in naming my article.

4. I am not aware that Kropotkin had any personal knowledge of the southeastern border of West Turkestan. But it is significant that Geikie, on his authority, speaks of 'immense sheets and terraces of loess' fringing the base of its mountainous border. The writer in SCIENCE assumes, as I believe unwarrantably, that the only indication of a former sea-level is the occurrence of sea shells. On the contrary, in the broader studies of physical geography that are now current, sea-levels may be determined in many places by terraces where shells are not present.

5. With reference to the occurrence of the bones of land animals and of terrestrial mollusks in the loess, I need only to say, that the great uncertainty concerning the situation of these remains with reference to the original deposit largely, if it does not entirely, breaks the force of the argument which is drawn from it. No one will deny that the wind has in many instances redeposited vast amounts of loess, nor that subsequent streams have done the same. But to go no farther than our own country, it is difficult for any one who is familiar with the situation of the loess over Northern Missouri, for instance, or in the center of the Mississippi Valley at Vicksburg, to believe that it has been deposited either by the wind or by flowing streams of water when the land stood at its present level.

In due time I hope to bring the facts in fuller detail before the public. But this much I may confidently say, that the whole problem of the loess has not yet been fully comprehended, much less has it been solved. If the renewed discussion elicited by my report shall contribute to an understanding of the subject, a great point will be gained. But I am sure that the as yet little understood facts of Central Asia will contribute much toward a solution of what has been one of the most perplexing of all the geological problems.

G. FREDERICK WRIGHT.

'THE LARYNX AS AN INSTRUMENT OF MUSIC.'

TO THE EDITOR OF SCIENCE: Noting in your issue of May 24, a communication from Arthur Gordon Webster quoting Professor Le Conte's reference to the larnyx, comparing it in its function to a horn and citing a passage from Helmholtz containing the same comparison, I am tempted to refer your readers to a much earlier example of the same conception. I quote the following from some notes of mine: "In 1700 Dodart ('Memoire sur les causes de la voix de l'homme,' par M. Dodart, *Memoire de l'Academie des Sciences*, 1700, p. 238) insisted that the trachea only furnishes the material of the voice, *i. e.*, the expired air. The glottis is the only organ of the voice. All the effects of the glottis for tones depend on the tension of its lips, and of its various internal structures. The concavity of the mouth has no part in the production of the voice, but it is a modifier of it, and still more is this true of the nose. He showed that Galen's comparison to a flute could not be accepted if one were to go into details. He spoke of the vibration of the ligaments, of the dilatations and contractions of the glottis. He asserted that the trachea is elongated in high notes and shortened in low ones. He likened the vocal organ rather *to a horn or trumpet. According to him the glottis is the place which corresponds to the lips of the musician; the body of the instrument extends from the glottis to the external orifice of the vocal canal, that is to say the mouth.*"

JONATHAN WRIGHT.

SHORTER ARTICLES.

PREDETERMINED ROOT-HAIR CELLS IN AZOLLA AND OTHER PLANTS.

ORDINARY root-hairs arise in acropetal succession in the zone where the surface tissue is becoming fixed; that is to say, in a region at some distance from the root apex, where the cells have ceased to divide and have reached, or are reaching, full elongation. They come from any or all of the superficial cells indif-