

difficult to carry out under the conditions of education in this country, our teachers could nevertheless, provided they are sufficiently well conversant with the German language, gather a large amount of useful hints, even if only from the method of treatment of the material. For use in Germany we have no doubt that the teachers will hail gladly the appearance of this volume, and the distinguished list of co-workers with Prof. Höfler is sufficient indication to stamp the volume as one of a high order.

Einführung in die Agrikulturmykologie. By Prof. Dr. A. Kossowicz. 1. Teil: Bodenbakteriologie. Pp. vii+143. (Berlin: Gebrüder Borntraeger, 1912.) Price 4 marks.

PROF. KOSSOWICZ is to be congratulated on having condensed into such a small book a review of the chief publications on soil mycology. The book partakes, in fact, more of the nature of an introduction to the literature of the subject than to the subject itself. The mere enumeration of the various workers for and against a hypothesis, without any criticism from the author, is not calculated to afford much help to a beginner. The subject-matter is divided into sections dealing with the part played by bacteria in the cycle of the elements carbon, oxygen, hydrogen, nitrogen, sulphur, phosphorus, and iron; the mycology of soil; the mycology of manure; and the influence of the manurial treatment on the micro-flora of the soil. For such a small book the bibliography is very comprehensive, constituting, as it does, about one-fourth of the total number of pages. The book is well illustrated, and as a short work of reference ought to prove of value to agricultural chemists and mycologists.

LETTERS TO THE EDITOR.

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The Piltdown Skull.

It had been my intention not to add anything further in print to my preliminary note (*Quart. Journ. Geol. Soc.*, vol. lxxix., 1913, p. 145) on the cranial cast obtained by Dr. Smith Woodward from his reconstruction of the Piltdown skull until I was in a position to make a full and comprehensive statement as to the precise significance of the information afforded by the cranial fragments as to the kind of brain possessed by the earliest known human inhabitant of Britain. But, although my investigations are now sufficiently advanced to permit me to undertake the writing of my report, it will be some months before it can be published; and in the meantime it is most undesirable that the present widespread misunderstandings should be allowed to breed further trouble and confusion for those who are interested in the elucidation of Mr. Charles Dawson's momentous discoveries.

Recent events have made it difficult for those who have relied wholly upon what has appeared in print to form any accurate conception of the meaning and importance of the Piltdown skull-fragments. It is quite certain that they afford the first evidence we

have obtained of a hitherto unknown group of the Hominidæ, so fundamentally distinct from all the early fossil men found in Europe as to be worthy of generic distinction—a "dawn-man" of a very primitive and generalised type. Certain features are so clearly ape-like as definitely to confirm the generally admitted kinship to the African anthropoid apes, as well as to distinguish *Eoanthropus* sharply and clearly from all other human remains. In other respects, however, there is a closer resemblance to the features of modern man than is found in the specialised group of Neanderthaloid palæolithic men. This curious association of features is not paradoxical, as some people pretend. The small and archaic brain and thick skull are undoubtedly human in character, but the mandible, in spite of the human molars it bears, is more simian than human. So far from being an impossible combination of characters, this association of human brain and simian features is precisely what I anticipated in my address to the British Association at Dundee (*NATURE*, September 26, 1912, p. 125), some months before I knew of the existence of the Piltdown skull, when I argued that in the evolution of man the development of the brain must have led the way. "The growth in intelligence and in the powers of discrimination no doubt led to a definite cultivation of the æsthetic sense, which, operating through sexual selection, brought about a gradual refinement of the features." Just as the young child still uses its teeth for purposes of attack, so in the dawn of human existence teeth suitable for offensive purposes were retained long after the brain had attained its distinctively human status and had made the hands even more serviceable instruments for attack.

That the ape-like conformation of the chin region signifies the inability to speak is surely a patent fallacy. Articulate speech must have come while the jaws were still simian in character; and the bony changes that produced a chin were the result mainly of that process of refinement to which I have already referred, to the reduction of the teeth, which was part of the same process, and, quite in a minor degree, to that process of growth and specialisation of the *genio-glossi* muscles which resulted from their use in speech.

A great source of misunderstanding will be got rid of if these obvious facts and the considerations based upon them be admitted.

In conclusion, I may answer many questioners by affirming that I still hold to every word of my preliminary note published in the *Quarterly Journal of the Geological Society*, as well as of the statements made in my lectures delivered before the *Royal Dublin Society* and the *Manchester Literary and Philosophical Society* last winter, and also to the facts demonstrated in my exhibit at the *Royal Society's soirée* in May.

G. ELLIOT SMITH.

University of Manchester, September 23.

Solar Electrical Phenomena.

In a lecture last January to the Christiania Academy, Prof. Birkeland¹ gave an interesting summary of his recent researches on solar and planetary electrical phenomena. He describes how in a study intended to elucidate the evolution of celestial bodies he examined the nature of the electric discharge taking place *in vacuo* in a large discharge vessel from a magnetisable globe serving as cathode. The experiments, which were made under widely differing conditions, were on a scale more ambitious than anything hitherto attempted. Two vessels of 300 and 1000 litres' capacity respectively were employed. In the larger of these the globe used was of 36 cm. diameter,

¹ "De l'origine des mondes," par K. Birkeland, *Arch. Sci. phys. et nat. Genève. Quatrième Période*, t. xxxv., Juin, 1913.