all minds, from that of the lowest animal to that of the highest human genius" (p. 269). What is this mind, of which the author speaks? And what is meant later by the author's division of reality into 'the material world' and 'the mental world' (p. 271), or 'the material world' and 'the spiritual world' (ibid). If we are dealing with indissociable constituents of matter, would it not be as wise to speak of 'the material world' and 'the world of duration,' or 'the material world' and 'the world of motion?' But I waive these questions, as being possibly the products of a 'feverish dream.' It must be accepted as a general answer to all such, and a sufficient consolation to the discontented, that 'the simple and the true remain' (p. 271).

As a last word I may add that the more sober of the philosophers of our time have, notwithstanding 'the intoxication of illusion,' been accustomed to think that it is not prudent for a philosopher who has no special knowledge of the subject to venture into other fields, as, for example, that of anthropology. Some even go so far as to believe that it is not wise for an anthropologist to venture into philosophical discussions unless he has acquainted himself with the writings of those who have preceded him in work of that kind. Perhaps it is because they are 'immersed in thaumaturgy' that they find in such contributions to philosophical literature more heat than light.

GEORGE STUART FULLERTON.

UNIVERSITY OF PENNSYLVANIA, February 27, 1896.

THE TEMPERATURE OF THE EARTH'S CRUST.

IN the December number of the *Journal of Science* Prof. Alexander Agassiz gives the temperatures found at different depths in a well-known mine in the Lake Superior region, as follows:

At 105 ft.—59° F.
At 4580 ft.—79° F.

Or an increase of temperature of 1° F. for each 223.7 ft.

With this he compares Lord Kelvin's figures of 1° in every 51 ft; also the figures obtained in the St. Gothard tunnel, showing a rise of 1° for every 50 ft.

The Lake Superior figures would make the solid crust of the earth nearly 90 miles in thickness, instead of Lord Kelvin's deduction of twenty miles.

Now I wish to suggest, as a tenable hypothesis, that the Lake Superior district having been far in the heart of the ice cap of the glacial period, the refrigeration of the crust of the earth penetrated to so great a depth that its effects *still linger*.

Take, for example, the 100° C. line, which normally is 9,000 feet below the surface. During the many thousand years of the ice cap this may have been forced downwards to a depth of, say, 40,000 ft. Since the removal of the ice, during, say, 7,000 years, the internal heat has been slowly rising towards the surface. But it has not yet had time to regain its former levels of temperature.

It would be interesting to ascertain what are the rates of increase of temperature now under regions where the subsoil is permanently frozen, as in the tundras of Siberia and Alaska.

It does not seem clear to me that the earth's crust necessarily became greatly thickened in the Superior region. The refrigeration need not have penetrated deeply enough for such an effect.

SERENO E. BISHOP.

HONOLULU, January 24, 1896.

THE X-RAYS.

SHORTLY after mailing my note of last week I took a photograph by means of the X-rays, using a Crookes' tube connected with an induction coil actuated by a make and break current, and therefore giving the electrodes a fixed polarity.

The photograph shows only one electrode which, from the manner in which the tube was connected, was the cathode, thus confirming the views expressed in my previous letter.

RALPH R. LAWRENCE.

BOSTON, March 5, 1896.

THE INSTINCT OF PECKING.

IN discussing Prof. Morgan's lecture on instinct it has several times been stated that chickens pecked instinctively, but had to be taught to drink. There was a note in *Nature* last year, concerning some species of Asiatic pheasants—it may possibly have been the Jungle Fowl—to the effect that the young did not