required a name. As bricks were made of it (not because it resembled a brick) he called it laterite, certainly without intending to include under it all materials of which bricks could be made. I admit that he did not know its true chemical composition, but in spite of that it must be accepted as the type of what we ought to call laterite.

As a matter of fact the majority of geologists and of scientific mining engineers are now using the word in this sense, the sense which I and others are defending, and that this is so a recent discussion in the pages of the Transactions of the Institution of Mining and Metallurgy, in connexion with a paper by Mr. G. Morrow Campbell on the "Origin of Laterite", is sufficient evidence. As to the word 'bauxite' I have no objection to its being applied to a laterite exceptionally poor in silica and iron, and therefore suitable for use as a source of aluminium and its compounds, as long as it is understood that it is so employed as a commercial mineral term and not as a rock name. Scientifically, however, it should be restricted to a mineral, if such exist, in which two molecules of water are combined with one of alumina.

We shall all look with interest for the results of Mr. Scrivenor's investigation of the chemical nature of the products of tropical denudation—under whatever name or names he may describe them.

JOHN W. EVANS.

IMPERIAL INSTITUTE.
July 1, 1910.

LATERITE AND BAUXITE.

SIR,—I am glad to learn from Mr. Crook's letter in the May number of the GEOLOGICAL MAGAZINE that I am not alone in holding certain views regarding the term laterite and also the term bauxite, but it is a pity that either side should be led into criticisms that are stronger than the occasion warrants.

I can understand Mr. Crook's surprise that anyone should decline to accept, without question, the new definition of laterite, seeing by what authority it is supported, and I grant that the proposed definition is attractive. But what, in my opinion, has been lost sight of, is that laterite was defined more than a hundred years ago, and that the extension of the term in tropical countries has been based on the early descriptions, the keynotes of which are brick and iron. When an innovation is proposed—for I must with all deference ask still to be allowed to consider this 'aluminous' definition an innovation—the first question is whether it is practicable, the next whether it is necessary. I do not think the change practicable, because the ideas of brick and iron have taken firm root and have led to the term being widely used for ferruginous rocks, useful in public works and in building. As its practicability is denied there is no question of its necessity; but were the change practicable, would the new be better than the old definition? The brick and iron characteristics are easily recognized; the aluminous is not. The word 'laterite' has no etymological connexion with aluminium; it has with brick, and so, indirectly, with iron, since the setting of laterite is dependent, mainly at any rate, on the presence of ferric hydroxide. Both Dr. Evans and

Mr. Crook appear to think—I hope that I am not doing them an injustice—that because the two definitions apply to the same thing, therefore they are the same. This is hardly logical. They emphasize distinct characteristics, scientific and commercial, and are therefore different.

An example illustrating the difficulty, however, will be more to the point than a long argument. In the Federated Malay States the chief crystalline rock is granite, and the mode of weathering is excellently shown by many miles of road sections in hilly country, where the transition from fresh rock to soil can frequently be followed. The rock weathers in situ to a soft mass, red or yellow, sometimes white, in colour, in which one sees round boulders of fresh granite that has resisted decomposition and so formed 'core-boulders'. I have taken a specimen from about midway between the soil and the fresh rock, and after drying have treated it with sulphuric acid for about one hour over a water-bath. The iron and aluminium that went into solution were precipitated as hydroxides, and the aluminium hydroxide separated by K H O and re-precipitated by ammonium chloride. After ignition I obtained over 13 per cent. of alumina, and as I must assume that this alumina exists in the rock as a hydrate or hydrates, the rock falls under the proposed new definition of laterite. It is a weathering product of a crystalline rock containing aluminium hydroxides in a tropical country. But no one here calls it laterite or wishes to do so; it does not harden on exposure, and is therefore of no use as a substitute for brick. It is decomposed granite, and it would be an unnecessary complication to call it anything else, in spite of the interesting fact that a considerable percentage of aluminium hydroxide has been formed during the process of decomposition. Indeed, it may prove that this feature of tropical weathering is so general that it cannot be regarded as characteristic of any one decomposition product, and that, if the presence of aluminium hydroxides is to be the test of laterite, then there will be a difficulty in excluding rocks that have no resemblance to Buchanan's laterite, as, for instance, the china-clay and clay-slate mentioned in my last letter.

We know that the composition of laterites varies with the character of the rock from which it is derived; and I have ventured to propose that, for the sake of simplicity, we should call bauxite certain laterites in India that have been stated to be bauxite. "Laterite is bauxite in various degrees of purity." "These are bauxites in blocks and in powder." I am now told that I am guilty of endeavouring to degrade the term 'bauxite' completely, and that my suggestion is positively harmful; while I am furthermore invited to assert that a mineral of a definite chemical composition, which has not yet been proved to exist, does not exist, and to state what name I propose to give it if it should be proved to exist. The word 'bauxite', Mr. Crook says, must be reserved for a hypothetical mineral of the composition $Al_2O_3 . 2H_2O$, and it may not be used as a rock-name until that hypothetical mineral is proved to be a myth; but there is some plausibility in my suggestion because the term has been used carelessly.

Bauxite was discovered in France, and France possesses a mineralogist who cannot be accused of using mineralogical terms

carelessly. In his *Minéralogie de la France et de ses Colonies*, iii, p. 342, Mons. A. Lacroix says: "Aussi me semble-t-il difficile de considérer la bauxite comme un minéral defini; il est bien plus probable que les produits désignés sous ce nom sont constitués suivant les cas par divers hydroxides d'alumine colloïdes mélangés à des hydroxides correspondants de fer et a diverses impurités, argile, sable quartzeux, etc. C'est en réalité une véritable roche." The last sentence of the above quotation makes further defence unnecessary.

This question of the use of the term 'laterite' is one in which there is abundant room for quiet discussion. My view may be extreme on the one side—indeed, is, I suppose, without question extreme in that I would like to see the term left to engineers to treat as they wish. Nevertheless, the adoption by the majority of geologists of the proposed 'aluminous' definition would not lead to a crisis, and I cannot believe that anyone or anything would suffer harm thereby. This seems to me to be an admirable opportunity for dropping the term altogether, and for substituting in its stead the term 'bauxite' when the composition justifies it; when this is not the case I would advocate the simple term 'decomposed gneiss', or whatever the rock may be, it being taken for granted that the production of aluminium hydroxides in quantity is a feature of tropical weathering.

J. B. Scrivenor.

Batu Gajah,
Federated Malay States.
June 15, 1910.

OBITUARY.

WILLIAM PHIPPS BLAKE, D.Sc., F.G.S.

Born June 1, 1826. Died — 1910.

W. P. Blake was born in New York, and educated at Yale Scientific School. In 1853 he was appointed geologist and mineralogist on the U.S. Pacific Railroad Expedition, later on he was geologist to the California State Board of Agriculture, in 1864 he became professor of mineralogy and geology in the College of California, and at the time of his death he was emeritus professor of metallurgy, geology, and mining, and director of the School of Mines in the University of Arizona. His more important papers relate to the geology and mineralogy of California and Arizona; but he had made observations on the glaciers of Alaska, on the geology of the Island of Yesso, Japan, and was the author of a volume on *The Production of the Precious Metals*, 1869 (see Geol. Mag. for 1868, p. 284, 1869, p. 361, and 1874, p. 464). He was elected a Fellow of the Geological Society of London in 1876.

MISCELLANEOUS.

Mr. H. B. Maufe, B.A., F.G.S., of the Geological Survey of Great Britain, has been appointed Director of the Geological Survey of Southern Rhodesia lately instituted by the Chartered Company.