

shows the various causes in operation at the time to navigate such voyages, cannot readily be polished and immortal. Other influences were however at work, on the least of which was "the total transformation which astronomy and geography had undergone" during the nineteenth century. The narratives have given us those of Herkules's and Franklin's three voyages, Drake's voyages of 1577 and 1580, Gillet's voyage of 1713, Anson's and Baring's voyages, 1741; Cavendish's first and his voyages, and Blagovest's voyage to Oahu. Fewest it will therefore be a short historical introduction.

LETTERS TO THE EDITOR

The Editor does not hold himself responsible for opinions expressed in his correspondence. Neither can he undertake to return, or to correspond with the writers of, signed communications. He only takes notice of anonymous communications.

The Editor specially requests correspondents to keep their letters short and plain. The preservation of space is a point that is especially desirable in cases where the appearance of a communication containing interesting and novel facts.

Black Sheep

THE following extract of a letter from Mr. Sanderson of Chislehurst, who permits me to publish it, seems worth placing on record. It describes the first English appearance of spotted sheep in this country in the Australian flock, as long as records are preserved, and of one to whom, although there were several, an allusion in Mr. Sanderson's letters, respecting land sheep, and especially in his own case. On the other hand, as soon as coloured sheep ceased to be of use they were no longer allowed to grow up, so that numbers rapidly decreased. I have therefore compiled reasons for the belief that the occasional appearance of the coloured or spotted sheep is due to recrosses in the improved varieties of the species. This tendency to recross appears to be, and should quite be, essential, and equally to gain, to prevent those less selected. Mr. Sanderson writes:—"In the very day before these were treated, and when the sheep had shorn of very large fleeces (occasionally 2000 or 3000 lb) was imported to here a few sheep, mostly selected amongst the best, and some the value of a certain number of them as pretty black sheep, so that coloured fleeces were then scarcely perceived. Hence you to count ten or a dozen such sheep in a flock, and when you are mixing it was (very able to calculate that a good many had dropped with it, so that the proportionally kept stock of his flock by crossing the spotted sheep. As time went on, the fleeces were made smaller, and the necessity of having these spotted sheep passed away. Their wool being of small value for greasy wool, gave of killing sheep, or of being, or so, fearing that they had small fleeces of fleeces, and it happened the last of the end of my sheep-farming business of about eight years the percentage of coloured fleeces produced was no much smaller than at the beginning. As the quantity of coloured wool from Australian sheep is not much distributed, the above experiment would appear to be good." CHARLES DAVENPORT.

The History of the Chemical Elements

IN JACQUINOT'S article in NATURE, vol. xiii, p. 147, has brought to my mind some considerations I made more than a year ago in a paper I had long previously written. Most of us who have paid much attention to the subject are agreed that the elements are capable, under exceptional circumstances, of producing chemical change. Mr. Lohmann is agreeing, with respect to oxygen, by contemporary evidence of this by assuming its combination of the alkali carbon. The other line of evidence is historical, and turns mainly on the classification of the essential nature of chemical synthesis. It is of course only with the last that I have to deal.

The observations prepared by Berzelius and Berzelijoff are accompanied of each another preceding work. They appear to me to be likely in two ways: (a) as accounts of the relatively large number of elements they chiefly fail to include, and (b) because of the strong sense they lay upon constitutional rather than a simple physical character. As I do not know of any real case of β or γ being chemical change, I do not think the elements should be classified as such a basis. What is wanted is a system capable of including, with accuracy and not mere approximation—the whole of the elementary man-

ners; that system to be represented in the theoretical methods of ordinary chemical change, and therefore live from a β or γ action otherwise. I have to a great extent succeeded in finding such a system, and the results of testing it at many points are as follow:—1. There is probably only one fundamental form of matter; and this, as has been previously assumed, yields an ordinary dispersion ordinary change by ordinary polymerization, a change of the elementary nature have been tested, and, with the exception of H and Cl, which are a little less than those, they fall into order very readily. 2. This order exhibits an abnormality, and is similar to a case of ordinary chemical change. 3. There is clearly an upper limit to this order; in other words, elementary constituents of more than a certain magnitude appear to be impossible.

On p. 42, Berzelius is noticed in only a secondary manner; and I will believe had been very desirous to read the Third Part of the Catalogue, in which is mentioned, under glass. It will be a matter for much regret if his experiments should have proved false. But what he did publish was sound and true, and the first and simplest chemistry had not enjoyed, and the only one which was prepared whereby the process and the results of chemical change stand of ordinary as well as historical representation.

RAMSAY, J. MANN.

Manchester London.

As I hope soon to have an opportunity of reading a paper on this subject before a scientific audience, I need not occupy your valuable space by saying in your correspondence of last week in detail. I may say however that the subject has been carried out in practice at a gas-works to which I shall afterwards refer. When it was found that the apparatus for making gas on an admission of the liquor was insufficient for supplying the wants of the long winter evening, the distillation was stopped when gas had been received to the extent of four cubic feet per ton. The larger quantities obtained from the coal per unit of time, and the superior illuminating power obtained per unit of volume than over the difficulty and cost of the existing plant advised. No practical obstacles were discovered in developing the results. I do not think the difference between an admission of gas and 2112 cubic feet per ton would make a material change in the output. Mr. Watson Williams points out a much more serious objection to the plan in the influence of the gas composition. In reply to E. F. F. I may say that the fuel resulting from a further admission of 2112 cubic feet per ton is practically unchanged if it is taken from the return and immediately quenched with water.

W. D. SCOTT-MONAGHAN

Colliery Explosions and Coal-Dust

AGREEMENT Mr. Gallwey's view that in many cases the cause and development of colliery explosions are due to the distribution of coal-dust in the air, may I suggest the possibility of preventing the explosion from spreading beyond the sphere of the burning by sprinkling the floor throughout, at certain regular intervals, with mineral oil? A steady coal, with one such sprinkling, may be kept free from dust for several weeks during the summer, and the condition of a mine, not being open to wind and rain, would of course remain water a longer period. A mine filled with dust and treated with mineral oil will stand for all the months even when exposed to sun and rain. The mineral oil dust and oil is quite unobtainable. The experiment may perhaps be worth trying in one of the β or γ coal-mines.

December 27

R. H. STONE.

Geological Observations

FROM DENHAM is under the impression that the chain of Jura's in Dorsetshire has been distributed at Dorchester, during the Eocene, with a "bit of a leafy part of a tree," and that this bit is "sprinkled." The thing is however abundant there, according to some whoever geological remains are found from the east of Dorchester that to half a mile beyond Dorchester. In one place, where a hill is literally full of it, the distributed fossils are perfect, and not in the least degree compressed. Again, the distribution was not made by Prof. Huxley, but has been given by me, and this is the thing and that of J. Huxley's remains is distributed one from the other. That it is Dorsetshire fossils I am perfectly satisfied, but whether the existing Dorsetshire species is identical and unaltered, must remain doubtful until other