obvious explanation of them, and has found, not only no sign of any deliberate mutilation, but overwhelming evidence of the reality of the ancient Egyptian's profound reverence for the bodies of his dead relations, and of his horror of mutilating them, even for the purpose of making the incisions necessary for embalming.

Since this correspondence began, a full discussion of all the data relating to the subject under consideration has been published in the report for 1907-8 on the Archaeological Survey of Nubia. There the facts will be found recorded for the use of anyone interested in the matter.

G. ELLIOT SMITH.

Effect of Heat on Soils.

MR. A. D. HALL in his opening address to the Agricultural Sub-section of the British Association at Sheffield mentioned "a process of heating the soil before sowing" and "a process of firing the soil preparatory to sowing the crop," both of which seem very similar to "burning bush" as practised in the West Indies. On reading Russel and Hutchinson's paper on "Partial Sterilisation of Soil" in *Journ. Agric. Sci.* for October, 1909, it struck me that their work afforded a probable explanation of "burning bush," and I now make the suggestion in the hopes of obtaining some evidence. The process seems to be similar to that known as *chena* in Ceylon, *ladang* in Malaya, and *jhuming* in India (see J. C. Willis, "Agriculture in the Tropics," pp. 1 and 2), and perhaps someone with experience of the East could throw further light on the question.

It is a common practice in Trinidad for a small cultivator to rent a piece of abandoned land, which is cleared by burning the "bush" in the dry season. In the wet season the clearing is generally planted with maize, which is usually followed by cassava, yams, taniais, &c. In a few years the cultivation is no longer remunerative, and the land, once abandoned, quickly goes back to "bush." One explanation is that the ashes of the burnt "bush" supply a certain amount of mineral plant food in a readily available form (the nitrogen in the plants burnt would, of course, be lost). This plant food would presumably produce an increased yield, but the effect would not last many years. Another—and I think a more probable—explanation is that the burning results in a partial sterilisation of the soil, with a greater production of ammonia. The fact that maize is the first crop grown after the "bush" has been burnt is significant, since it is a crop which is benefited by a nitrogenous manure.

C. HAROLD WRIGHT.

Government Laboratory, Trinidad, B.W.I.,
October 8.

The Colours and Spectrum of Water.

A PERUSAL of the articles which have appeared in your journal on this subject (*NATURE*, vol. lxxxiii., pp. 48, 68, 188, 487, and vol. lxxxiv., p. 87) leads me to ask if the spectrum of water has ever been thoroughly investigated. It is difficult to believe that this has not been done, and yet there is but little allusion to the important bearing the character of the spectrum must have upon the colour. I should be glad to learn what is the origin of a feature I have sometimes observed in the spectrum, as seen with a "miniature spectroscope" by Browning. This is a dark band or line at about wave-length 6000, which I noticed in June, 1887, in Sark, in clear water, both in the sea and in fresh water. The latter was bluish-green, and the sea was green. So far as this line would have any influence on the colour of the water, it would tend to make it blue; but the colour would be much more influenced by the very strong general absorption in the whole of the red and orange beyond the dark line. In the sea water this general absorption extended more feebly to the D line of the solar spectrum, and even to the dry-air band δ .

In the deep green water of Lago Maggiore the spectrum was almost identical with that of the sea at Sark; I made the wave-length of the dark line about 6050.

The Lake of Geneva is noted for the deep blue of its

clear water. In it I failed to see the dark line, but the general absorption of the red end of the spectrum was very striking.

The bluest water I ever saw—bluer than the Mediterranean, Red Sea, or Indian Ocean (I have not been to Capri)—was, however, the Blaue See, near Kandersteg, and the Lago di Garda. In the former, pieces of pot at the bottom appeared pure Prussian-blue. During a stay of a few days by the Lago di Garda I could not make out the law of its changes in apparent colour, but at times it was far bluer than the bluest sky I ever saw. It usually had a slightly greenish tinge. Both these lakes are extremely clear. I regret not having observed their spectrum.

T. W. BACKHOUSE.

West Hendon House, Sunderland, October 19.

Luminous Paint.

MR. C. A. EMERY, of Marlborough College, has directed my attention to a passage in Livy (xxxix., 13) where the following occurs:—

"Matronas Baccharum cum ardentibus facibus decurrere ad Tiberim, demissasque in aquam faces, quia vivum sulphur cum calce insit, integra flamma efferre."

This he renders:—

"The Bacchantes would run down to the Tiber with burning torches, and plunging them into the water would take them out with the flame unextinguished, because they were covered with a mixture of living sulphur and lime."

The expression "vivum sulphur" is thus explained by Pliny:—

"In Italia quoque invenitur sulphur. Genera quatuor: vivum, quod Graeci apyron vocant, nascitur solidum, hoc est, gleba: quo solum ex omnibus generibus medicum utuntur. Solum (cetera enim liquore constant, et conficiuntur oleo incocata) vivum effoditur, translucetque, et viret."—Plinii Hist. Nat. Lib., xxxv., 50.

It would seem, therefore, that calcium sulphide was discovered, and its luminosity observed, about nineteen hundred years before Marggraf, who in 1750 A.D. prepared the substance by "calcining gypsum with combustible matter." Eighteen years later Canton obtained the same effect by "igniting calcined oyster-shells with sulphur." (Inverted commas from Roscoe and Schorlemmer's "Treatise on Chemistry," under "Calcium and Sulphur.")

As neither of these manufacturing methods is difficult, it seems reasonable to suppose that one or other might have been known in Livy's day, and from the Latin text a modification of Canton's method seems probable.

Except for the above, I can find no direct reference to the discovery of calcium sulphide.

I noticed when reading Charles Reade's novel "The Cloister and the Hearth" that one of the more striking incidents depended on the use of a phosphorescent paint. As this powerful story is of the fifteenth century, I considered the phosphorescent paint an anachronism, for Brandt is said to have discovered phosphorus in 1669, and the "Bologna stone" (barium sulphide) was discovered only a few years earlier. But Reade may have been aware of the passage in Livy or may have known about Pliny's "Pholas"—the rock-boring mollusc (Piddock)—the phosphorescence of which is said to remain long after death.

Possibly some readers of *NATURE* may be able to throw more light on the origin of "luminous paint."

R. G. DURRANT.

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Velocity of Negative Ions in Hydrogen at Atmospheric Pressure.

SOME time ago Prof. Chattock and I attempted to measure the velocity of the ions from a point discharging in pure and impure hydrogen at atmospheric pressure by the wind-pressure method, in the hope of finding that the negative ion was influenced by the presence of small traces of oxygen. The results were given in *Phil. Mag.*, April, in which it was shown that the change which the com-