

to explain the contrasted experimental results of the temperature effect of the large mass, and the lack of it in the small mass. For, obviously, the temperatures of the masses may now be interchanged without altering the value of the attraction if only the value of θ is constant.

But, in the actual experiments by Dr. Shaw, might not the heating of the large mass near the small one possibly involve an increase of θ ? And again, in the heating of the small mass carried out by Poynting and Phillips, the earth itself being the large mass, might not the value of θ be practically constant? If so, possibly the formula (1a) here suggested might prove consistent with all the experimental results just reviewed.

E. H. BARTON.

Nottingham, July 18.

The Gun-firing on the Western Front.

IN NATURE for July 13 Dr. C. Davison directs attention to Dr. van Everdingen's investigations with regard to the propagation of sound, and he also refers to the inaudibility of the reports in the face of a gentle wind when the observer was comparatively near. In this neighbourhood the sounds are heard distinctly when a quiet situation is found, but a very marked peculiarity is the fact that the direction of the wind seems to make no appreciable difference in the intensity of the sound. For example, on July 19 the booming was very intense and quite easily heard with the wind blowing from the north-west. On the 20th, with the wind from the east, the audibility was no greater, possibly not so great. Westerly winds have been frequent of late, but have not diminished the sounds at all, whereas it is a fact that on some occasions with an easterly wind no sounds were heard. It is, of course, impossible to say whether there was firing or not on these latter occasions, but it is certainly worth recording that on the majority of the occasions upon which I have heard the sounds since the end of 1914 I have at the same time observed that the wind was westerly.

Presumably in this neighbourhood we are beyond the silent zone, and in the second-sound area, and the suggestion seems to be that in this area the effect of wind is negligible. Two further points worth noting are the facts that the sounds here are practically as intense as at Brighton, though we are about fifty miles farther from the source, and also that the direction of the source is always fairly obvious.

The sounds being so distinct here, and having lost so little intensity in the fifty miles which lie between this neighbourhood and Brighton, it seems likely that they should still be audible at much greater distances. Possibly they could be traced to very extreme distances with the aid of some very sensitive sound detector, if any suitable instrument is available.

It would also be interesting to get evidence from aeronauts. Plenty of balloons are in use now, and doubtless the sounds have been noted, if audible.

C. WELBORNE PIPER.

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Portraits of Wm. Smith.

In Phillips's "Memoirs of Wm. Smith," the father of English geology, p. 125, reference is made to his portrait, taken in 1805, by Solomon Williams, and another by Jackson, and still another by Fourau, the last presumably being now in the Geological Society's rooms. So far I have been unable to trace the portraits by the two first-named artists. Can any of your readers assist me?

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NATIONAL AFFORESTATION.

SIR W. SCHLICH, in an important article in the *Quarterly Journal of Forestry* for July, urges the importance of afforestation and discusses the measures which should be taken to secure for the nation a sufficient supply of timber in the future. The quantity of timber used in the United Kingdom is enormous, and increases year by year. In addition to the home production, estimated at about 2,000,000 loads annually, there was an import of 11,590,318 loads, valued at 33,788,884*l.*, in 1913, as compared with 10,104,504 loads, worth 25,676,988*l.*, in 1899. Only 10 per cent. of the total timber imported in 1913 came from British possessions, as against 22 per cent. in 1899. All these figures relate solely to the raw material, timber; but there must be added wood manufactures to the value of 3,583,187*l.*, and wood-pulp estimated at 4,617,739*l.*, entering our ports in 1913. We draw our main supplies from Russia, Sweden, Norway, France, the United States, and Canada. In all these countries, except Russia and Canada, the tendency in the future will be towards restricted production, diminished export, and increasing prices of timber, owing to the annual growth in the forests not being sufficient to replace what is taken away by cuttings and by forest fires. Our main imports are coniferous timber, pitwood, and wood-pulp, three classes of forest produce which can be profitably produced in our climate. A review of the whole situation shows that a considerable increase in the area under timber in the United Kingdom would be economically sound, and would also serve as an insurance against an unexpected timber famine brought about by international complications in the future.

Sir W. Schlich discusses at length the amount and nature of the land available for afforestation. As most forest work is done in winter, when agricultural work is slack, a scheme of afforestation will provide extra labour for agriculture in spring and summer, and consequently will be a considerable help to increased productivity of the land generally. This point is of especial importance in connection with small holdings, and should be taken into account when considering schemes for the settlement of discharged soldiers after the war. Very large continuous forest tracts are not necessary. Small blocks of woodland, with a minimum area of 500 acres, scattered over the country in the vicinity of small holdings, make an ideal combination. Sir W. Schlich summarises his proposals for afforestation as follows:—

(1) The afforestation of not less than 3,000,000 acres of surplus land, by planting about 30,000 acres a year.

(2) Private proprietors, Corporations, and the State should take part in the work of afforestation, the State doing that part which the other two agencies are not willing or able to undertake.

(3) Financial assistance should be given to private proprietors in the work of afforestation, if necessary, by making advances to them at the rate of interest at which the State can take up money.

To secure success from the very outset it is essential