

CORRESPONDENCE.

PROF. J. MILNE ON THE DISTRIBUTION OF VOLCANOS.

SIR,—We are fortunate in having Prof. Milne residing near the volcanic band of the Pacific coast, and shall no doubt have our knowledge of vulcanology advanced by his studies. There is cogency in the reasons which he adduces, to explain the occurrence of vents along the steep margins of oceans, through the thickening of the crust by the cooling effect of the water. He tells us that, “without entering into any calculations on the subject, it is not at all unlikely that, as in one case we have land cooling beneath an atmosphere and the compensating effects of a sun, whilst in the other case we have land cooling beneath water, which, from all we know about deep-sea temperatures, is usually very cold, we should find any given isotherm at a much greater depth beneath the rocks, which form the bed of an ocean, as compared with the depth at which we find it beneath the rocks which form the land.”

But why not “enter into calculation,” when, as in the present case, that is so easy, and add what this “much greater depth” will be?

Say that the mean temperature of England is 50° Fahr. And suppose the temperature of the sea-bottom to be 32°. The difference is 18°. Then, allowing an increase near the surface of one degree for every 50 or 60 feet of descent, the melting temperature of rock (whatever that may be) will be reached 18 times 50 or 60 feet lower beneath the ocean-bottom, than beneath England. This will make the crust only from 900 to 1080 feet thicker beneath the sea-bottom. But the melting temperature will be reached actually nearer to the solid surface beneath the sea-bottom, than beneath dry ground, which, as in parts of Siberia, is perpetually frozen.

I cannot help suspecting that Professor Milne had in his mind a greater difference than the above, when he used the words “much greater depth.” And I am sure that to geologists in general, whose ideas of time and space are formed upon a vast scale, these words would convey a much larger meaning than the modest fact.

It is really time that scientific men and excellent geologists, like my friend Mr. S. V. Wood, jun., should cease to quote with approval such an unphilosophic saying as that “figures may be made to prove anything.” Figures do but carry out to its legitimate conclusion some foregone assumption. If the result be wrong, not the figures, but the assumption is in fault. For instance, if there is any error in the result of the abstruse calculation which I have indicated above, it lies, not in the application of the multiplication table, but in the assumption that the temperature of the ground beneath land and sea alike increases near the surface by one degree Fahr. for every fifty or sixty feet of descent.

If this assumption is doubted, I think I have shown why it is correct, in the *Phil. Mag.* for June 1879, p. 382. O. FISHER.

HARLTON, CAMBRIDGE, 10th April, 1880.