Letters to the Editor.

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The British Association.

THE Association is to consider whether it will once more adventure into the outer regions of the Empire. That such transgress is desirable I am satisfied and so stated most definitely in the lecture I gave in 1915, at the Royal Institution, on our Australian excursion. In the interest of the younger scientific generation and of our Empire, it is of the utmost importance that we should roam over the world and discover its amenities—but the effort must be wholehearted, whenever it be made. The one failure of our Australian expedition was the insufficient support of the younger men.

It is a question whether, at the present time, when the cost of travel is so high, it will be desirable to attempt a new expedition—the chance that it will be well supported by the young men is not great. The Society of Chemical Industry could carry only a very small party last year to Canada. Therefore, the choice of a region that shall not be too distant is desirable, if the decision be to travel.

Properly speaking, the Association should go further westward, to British Columbia, north of the C.P.R., to visualise its potentialities and gain some idea of its conditions. To recommence the cycle at a middle point such as Toronto seems undesirable, at present. Montreal is the natural and would be the proper point of redeparture and discovery. It has also the advantage that it is the centre of the only region on the American continent where freedom still prevails and men are thought to be capable of taking care of themselves. It is the duty of science to protest and erect some barrier against the advancing wave of spurious puritanism which so affects Americans and now so threatens the freedom of mankind. The recent all but successful attempt to ban Darwinism in every shape and form is sufficient proof of what may happen. HENRY E. ARMSTRONG.

Bohr and Langmuir Atoms.

CHEMISTS feel a difficulty in explaining molecular combination in terms of electrical attraction between the apparently revolving electrons which seem to compose the peripheral parts of an atom; and they naturally prefer a more static arrangement. Indeed, it is not easy to explain the stability of molecules in terms of any kind of purely electrical attraction between the atoms composing them: and yet, ever since Faraday, there has been an instinctive feeling that electrical attraction and chemical affinity are one and the same.

The facts of spectroscopy seem to insist on a system of revolving electric charges, while the facts of chemical combination seem to demand forces which can be treated statically; so it has been suggested that internal electrons are responsible for the radiation, while external electrons control the chemical forces. But the stability of chemical compounds can scarcely depend on loosely held external electrons, which, moreover, ought to be revolving just as much though not so fast as the inner ones.

May not a reconciliation be found by abandoning the idea of electrical attraction between atoms as the major chemical force, and substituting for it the interlacement of the magnetic fields which inevitably accompany rapidly revolving electric charges. The orbital motion of the electrons responsible for chemical affinity, so far from constituting a difficulty, gives us a clue; for in every magnet electrons are rapidly revolving, and yet magnetic force is static. The clinging together of nails or needles near a magnet is all due to revolving electrons. Working with magnetised steel spheres, tetrahedra, and other shapes, some one with the ingenuity of Dr. Langmuir or Prof. Bragg might succeed in building up structures or models of adequate chemical significance.

The difficulty about substituting a magnetic field for an electric one, as accounting for the facts of chemical affinity, is no doubt the double polarity. But, on the other hand, this inevitable feature gives greater scope as well as greater complexity, and may ultimately be found to be an advantage; in fact, I am beginning to think that the constitution of bodies cannot be explained without it. The phenomena which long ago suggested "normal- and contra-valence" would fall into line. The stability of chemical combination would be all that could be desired, and the electrons in each atom would be peacefully engaged in giving their spectroscopic evidence (so well interpreted by the genius of Prof. Bohr), unharassed in their movements and perturbations by having to associate themselves with any electric field other than that of their own nucleus. Their magnetic linkages would be a sort of unconscious extra.

The undoubted phenomenon of ionisation would have to be developed independently, along with other known facts about gross positive and negative electric charges, but in the formation of stable chemical molecules we should not have to appeal to ionic charge. Moreover, certain molecular groupings, held together by magnetic forces, might be found readily susceptible to ionisation, especially when subject to bombardment, or when packed close together in a liquid.

I do not suppose that magnetic attraction as the equivalent of chemical affinity is any new idea, but I suggest that it has been inadequately developed, and that it seems capable of effecting a reconciliation between the extraordinarily ingenious schemes—apparently opposed, and yet both containing elements of truth—of which the names at the head of this letter may be regarded as principal types.

OLIVER LODGE.

The Acoustics of Enclosed Spaces.

SINCE writing the letter published in NATURE of August 19, p. 247, my attention has been directed to a paper on "Sound Proof Partitions" by Prof. R. F. Watson (University of Illinois Bulletin for March 1922). The paper contains a valuable experimental investigation on one aspect of the subject, but much remains to be done.

I take this opportunity of correcting an error which seriously affects the numerical results I gave for the sound transmitted through walls. In applying the optical equations, I forgot for the moment that the intensity of reflection in the case of sound does not only depend on the refractive index but also on the relative densities of the two bodies concerned. Even if the refractive indices were equal, so that the sound would proceed in the same direction, there would still be a powerful reflection if the densities were very unequal. In the equation I gave, $1-\mu^2$ should be replaced by $a-\mu^2 a^{-1}$, where a is the ratio of the densities. When sound passes from air to a solid body the second term is in general negligible, and