

# BRITISH AMERICAN JOURNAL.

## ORIGINAL COMMUNICATIONS.

ART. XXXIII.—*The Correlation of the Vital and Physical Forces.* A Prize Thesis for the Degree of M.D., C.M. By R. MAURICE BUCKE.

### PART I.

I commence by stating it as my belief that generally conversion takes place through the chemical force, that is to say, when any one of the physical forces merges itself into one of the vital, it does so by inducing a chemical change, and so liberating chemical force, which is then in virtue of the form of matter through which it acts, continued as a vital force; the form of this latter which is thus called forth, will depend upon the kind of tissue, that is, the form of cell through which the chemical force passes, in which it is liberated, and in which it merges itself into the vital force which is its resultant; and conversely, when a vital action manifests itself as physical force, it does so in the first place by inducing chemical change, and is then continued in the physical force which is the resultant of this change.

Supposing this to be the case, the following laws will be found of the utmost importance:

Law I. When bodies not already chemically united with others enter into combination, force of some kind is evolved, and the amount of this force will be in the direct ratio of the strength of the affinity existing between the bodies thus uniting.\* In the same ratio also will be the intimacy of the union, the divergence of the characters of the resulting body from its constituents,† and the stability of the new compound.‡

\* To illustrate this part of the law, I refer to Dr. Wood's experiments "on the heat of chemical combination." Phil. Mag. Vol. II, of the 4th series, p. 208, also Vol. IV, of the 4th series, p. 370.

† This part of the law will not apply to organic chemistry.

‡ Even if solution be regarded as chemical action, as it probably should be, (See "Thoughts on Solution and the Chemical-Process," by T. S. Hunt. Amer. Journal of Science and Art, Second series, Vol. XIX, Jan'y. 1854,) it is no exception to this law, for when cold results, or the opposite of any force, it is due to the change in consistence which one of the bodies concerned has undergone. See Grove on "The correlation of the Physical forces," p. 174.