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

PART II.

I pass on now to the consideration of the second part of my subject, and if any impression has already been made by the foregoing arguments I doubt not but that it will be materially strengthened by those now about to be adduced.

I shall speak then in this place of those cases where the physical forces pass into the vital; and conversely the vital into the physical by direct contact with the living or recently dead tissues.

It is known that to effect the conversion of one physical force into another, some special material must be used through which to act, and this material differs somewhat in the case of each instance of correlation; though at the same time many and very diverse bodies will often supply the necessary condition for the same change. Now, however, we have an entirely distinct modification of force to deal with, and it might easily have been predicted *a priori* that some special material substratum would have to be employed to effect the conversion of ordinary force into this new one. And this, in fact we find to be the case, for to effect the conversion of these forces, the one into the other, we must always have organized matter through which to act, and though this is not of necessity alive, in the ordinary acceptance of that term, yet it must be in a state closely allied to vitality, as recently dead tissue, or as in the case of the seed which is said to be in a state of "dormant vitality." And here we have as it seems to me, an almost, if not quite, insuperable bar to the doctrine of equivocal generation; which can never be received till some exception be pointed out to the law I have laid down.

It may be considered as proved by the following facts that nerve force and electricity are not identical. For (1) no electric current can be detected in a nerve along which nerve force is known to be passing. (2) By ligaturing a nerve its conducting power for electricity is not in the least impaired; while for nerve force it is destroyed. And (3) if a piece of nerve be removed and the ends thus left be connected by means of a conductor, electricity will still pass along it, but nerve force will not.*

* Lectures on Physiology by Prof. Fraser.