## MAGNETO-ELECTRIC FORCE.

quantity of effect greater, in any degree whatever, than the quantity of action (active force) employed.

Now it is very easy to misapprehend the significance of this law and to argue that the utilization of the effect is a use of the active force (action); meaning, thereby, that the force is used in the sense of 'used up,' 'consumed,' ' expressed' into effect. . .i. e., into something else, and, consequently, is no longer existent as force or power. Such inference is not supported by fact, and is unreasonable. If the descent of one weight is employed in raising another.. the power or force is merely transferred from the first to the second; (it may or may not be equally available for further employment, but it is existent . . all of it, and theoretically available.) So in the steam engine .. the steam having performed its office (produced its mechanical effect) has not necessarily lost any of the caloric-force derived by it, as water, from the combustion of the coal. If all the heat could be now abstracted from the waste steam it might be re-applied to repeat the effect, and so on, for an unlimited number of times. In practice only a small part of the caloric-force (or steam power) can be thus made again available, but even this small part . . namely, that portion of the waste steam used to heat the water supplying the boiler or the air supplying the furnace . . is sufficient to demonstrate the proposition that action (meaning thereby mechanical force or power) is not converted into the equivalent effect, in the sense of being, by such conversion, 'used up,' and consumed.

Mechanical effect is a manifestation of active force overcoming resistance: the resistance having been overcome, the force is no longer active, it becomes qui-

212