

and with the same angular velocity, electrical currents are called into play in the mass.

This rule, thus simple from its generality, though inevitably complex in every special case, may be looked upon as supplying the first demand of philosophy, *the law of the phenomena*; and accordingly Dr. Faraday has, in all his subsequent researches on magneto-electric induction, applied this law to his experiments; and has thereby unravelled an immense amount of apparent inconsistency and confusion, for those who have followed him in his mode of conceiving the subject.

But yet other philosophers have regarded these phenomena in other points of view, and have stated the laws of the phenomena in a manner different from Faraday's, although for the most part equivalent to his. And these attempts to express, in the most simple and general form, the law of the phenomena of magneto-electrical induction, have naturally been combined with the expression of other laws of electrical and magnetical phenomena. Further, these endeavors to connect and generalize the Facts have naturally been clothed in the garb of various Theories:—the *laws of phenomena* have been expressed in terms of the supposed *causes of the phenomena*; as fluids, attractions and repulsions, particles with currents running through them or round them, physical lines of force, and the like. Such views, and the conflict of them, are the natural and hopeful prognostics of a theory which shall harmonize their discords and include all that each contains of Truth. The fermentation at present is perhaps too great to allow us to see clearly the truth which lies at the bottom. But a few of the leading points of recent discussions on these subjects will be noticed in the Additions to this volume.

CHAPTER IX.

TRANSITION TO CHEMICAL SCIENCE.

THE preceding train of generalization may justly appear extensive, and of itself well worthy of admiration. Yet we are to consider all that has there been established as only one-half of the science to which it belongs,—one limb of the colossal form of Chemistry. We