

The various other circumstances which terrestrial magnetism exhibits,—the diurnal and annual changes of the position of the compass-needle;—the larger secular change which affects it in the course of years;—the difference of intensity at different places, and other facts, have naturally occupied philosophers with the attempt to determine, both the laws of the phenomena and their causes. But these attempts necessarily depend, not upon laws of statical magnetism, such as they have been explained above; but upon the laws by which the production and intensity of magnetism in different cases are regulated;—laws which belong to a different province, and are related to a different set of principles. Thus, for example, we have not attempted to explain the discovery of the laws by which heat influences magnetism; and therefore we cannot now give an account of those theories of the facts relating to terrestrial magnetism, which depend upon the influence of temperature. The conditions of excitation of magnetism are best studied by comparing this force with other cases where the same effects are produced by very different apparent agencies; such as galvanic and thermo-electricity. To the history of these we shall presently proceed.

*Conclusion.*—The hypothesis of magnetic fluids, as physical realities, was never widely or strongly embraced, as that of electric fluids was. For though the hypothesis accounted, to a remarkable degree of exactness, for large classes of the phenomena, the presence of a material fluid was not indicated by facts of a different kind, such as the spark, the discharge from points, the shock, and its mechanical effects. Thus the belief of a peculiar magnetic fluid or fluids was not forced upon men's minds; and the doctrine above stated was probably entertained by most of its adherents, chiefly as a means of expressing the laws of phenomena in their elementary form.

One other observation occurs here. We have seen that the supposition of a fluid moveable from one part of bodies to another, and capable of accumulation in different parts of the surface, appeared at first to be as distinctly authorized by magnetic as by electric phenomena; and yet that it afterwards appeared, by calculation, that this must be considered as a derivative result; no real transfer of fluid taking place except within the limits of the insensible particles of the body. Without attempting to found a formula of philosophizing on this circumstance, we may observe, that this occurrence, like the disproof of heat as a material fluid, shows the possibility of an hypothesis which shall very exactly satisfy many phenomena, and yet be incomplete: it