

regarding the equivalence of closed electrical currents with magnets. This led, first, to the reduction of all magnetic effects to the action of electrical currents; and, secondly, to the enunciation of a fundamental law of the interaction of two elements of electricity in motion. A third leading idea was that of reducing the interaction of all bodies to that of the mutual action of pairs of bodies. This idea could in general be considered as well established and confirmed by experience on a large scale.”¹

This leads me to another and a final remark on the view of natural phenomena, first introduced by Newton's gravitation formula, which has been so successful in the calculation of all the movements of cosmic bodies, and which in the eyes of such a great authority as Laplace contained the clue to an explanation also of molar and molecular phenomena.² This view calculates

39.
Necessity of
developing
the infinitesimal
methods.

¹ 'Electrodynamische Maasbestimmungen,' 1878, p. 645.

² Although Weber followed the lines so deeply impressed upon the whole of Continental thought by the labours of Laplace and his school, it does not seem that he held the same exalted opinion of the value of any mathematical formula as did Laplace. Though he looked upon his electro-dynamic law as well established by experiment and valuable in guiding further research, he was fully impressed with the fact that all such formulæ are merely provisional. Thus he says in the first part of his researches, written in the year 1846: "It seems to follow that the immediate interaction of two electrical particles does not depend upon these alone, but also upon the presence of third bodies. . . . It is

conceivable that the forces comprised in the discovered fundamental law may be partly the forces which two electrical particles exert indirectly on each other, and which therefore depend on the intervening medium. . . . The general law for the determination of the acting forces might perhaps be yet more simply expressed by taking the intervening medium into account, than has been possible without it in the fundamental law now established. The exploration of the intervening medium, which might afford an insight into many other matters, can alone give an answer to this question. . . . A hope now exists that it will be possible, in several new ways, to gain some information as to the neutral electric fluid which pervades everything. Perhaps in