

introduced by Dufay;<sup>4</sup> of two electricities each repelling itself and attracting the other. If we suppose that there is only one fluid, which repels itself and attracts all other matter, we obtain, in many cases, the same general results as if we suppose two fluids; thus, if an electrized body, overcharged with the single fluid, act upon a ball, it drives the electric fluid in the ball to the further side by its repulsion, and then attracts the ball by attracting the matter of the ball more than it repels the fluid which is upon the ball. If we suppose two fluids, the positively electrized body draws the negative fluid to the nearer side of the ball, repels the positive fluid to the opposite side, and attracts the ball on the whole, because the attracted fluid is nearer than that which is repelled. The verification of either of these hypotheses, and the determination of their details, depended necessarily upon experiment and calculation. It was under the hypothesis of a single fluid that this trial was first properly made. *Æpinus* of Petersburg published, in 1759, his *Tentamen Theoriæ Electricitatis et Magnetismi*; in which he traces mathematically the consequences of the hypothesis of an electric fluid, attracting all other matter, but repelling itself; the law of force of this repulsion and attraction he did not pretend to assign precisely, confining himself to the supposition that the mutual force of the particles increases as the distance decreases. But it was found, that in order to make this theory tenable, an additional supposition was required, namely, that the particles of bodies repel each other as much as they attract the electric fluid.<sup>5</sup> For if two bodies, A and B, be in their natural electrical condition, they neither attract nor repel each other. Now, in this case, the fluid in A attracts the matter in B and repels the fluid in B with equal energy, and thus no tendency to motion results from the fluid in A; and if we further suppose that the *matter* in A attracts the fluid in B and *repels the matter* in B with equal energy, we have the resulting mutual inactivity of the two bodies explained; but without the latter supposition, there would be a mutual attraction: or we may put the truth more simply thus; two negatively electrized bodies repel each other; if negative electrization were merely the abstraction of the fluid which is the repulsive element, this result could not follow except there were a repulsion in the bodies themselves, independent of the fluid. And thus *Æpinus* found himself compelled to assume this mutual repulsion of material particles; he had, in fact, the alter-

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<sup>4</sup> *Mém. A. P.* 1733, p. 467.

<sup>5</sup> Robison, vol. iv. p. 18.