At almost every meeting of the Academy during the remainder of that year and the beginning of the following one, he had new developements or new confirmations of his theory to announce. The most hypothetical part of his theory,—the proposition that magnets might be considered in their effects as identical with spiral voltaic wires,—he asserted from the very first. The mutual attraction and repulsion of voltaic wires,—the laws of this action,—the deduction of the observed facts from it by calculation,—the determination, by new experiments, of the constant quantities which entered into his formulæ,—followed in rapid succession. The theory must be briefly stated. It had already been seen that parallel voltaic currents attracted each other; when, instead of being parallel, they were situate in any directions, they still exerted attractive and repulsive forces depending on the distance, and on the directions of each element of both currents. Add to this doctrine the hypothetical constitution of magnets, namely, that a voltaic current runs round the axis of each particle, and we have the means of calculating a vast variety of results which may be compared with experiment. But the laws of the elementary forces required further fixation. What *functions* are the forces of the distance and the directions of the elements?

To extract from experiment an answer to this inquiry was far from easy, for the elementary forces were mathematically connected with the observed facts, by a double mathematical integration;—a long, and, while the constant coefficients remained undefined, hardly a possible operation. Ampère made some trials in this way, but his happier genius suggested to him a better path. It occurred to him, that if his integrals, without being specially found, could be shown to vanish upon the whole, under certain conditions of the problem, this circumstance would correspond to arrangements of his apparatus in which a state of equilibrium was preserved, however the form of some of the parts might be changed. He found two such cases, which were of great importance to the theory. The first of these cases proved that the force exerted by any element of the voltaic wire might be resolved into other forces by a theorem resembling the well-known proposition of the parallelogram of forces. This was proved by showing that the action of a straight wire is the same with that of another wire which joins the same extremities, but is bent and contorted in any way whatever. But it still remained necessary to determine two fundamental quantities; one which expressed the *power* of the distance according to which the force varied; the other, the de-