

were patiently laboring to bring the mechanical problem of the universe into its most distinct form, in order that it might be solved at last and forever.

I do not mean to assert that Descartes borrowed his doctrines from Kepler, or from any of his predecessors, for the theory was sufficiently obvious; and especially if we suppose the inventor to seek his suggestions rather in the casual examples offered to the sense than in the exact laws of motion. Nor would it be reasonable to rob this philosopher of that credit, of the plausible deduction of a vast system from apparently simple principles, which, at the time, was so much admired; and which undoubtedly was the great cause of the many converts to his views. At the same time we may venture to say that a system of doctrine thus deduced from assumed principles by a long chain of reasoning, and not verified and confirmed at every step by detailed and exact facts, has hardly a chance of containing any truth. Descartes said that he should think it little to show how the world is constructed, if he could not also show that it *must* of necessity have been so constructed. The more modest philosophy which has survived the boastings of his school is content to receive all its knowledge of facts from experience, and never dreams of interposing its peremptory *must be* when nature is ready to tell us what *is*. The *à priori* philosopher has, however, always a strong feeling in his favor among men. The deductive form of his speculations gives them something of the charm and the apparent certainty of pure mathematics; and while he avoids that laborious recurrence to experiments, and measures, and multiplied observations, which is irksome and distasteful to those who are impatient to grow wise at once, every fact of which the theory appears to give an explanation, seems to be an unasked and almost an infallible witness in its favor.

My business with Descartes here is only with his physical Theory of Vortices; which, great as was its glory at one time, is now utterly extinguished. It was propounded in his *Principia Philosophiæ*, in 1644. In order to arrive at this theory, he begins, as might be expected of him, from reasonings sufficiently general. He lays it down as a maxim, in the first sentence of his book, that a person who seeks for truth must, once in his life, doubt of all that he most believes. Conceiving himself thus to have stripped himself of all his belief on all subjects, in order to resume that part of it which merits to be retained, he begins with his celebrated assertion, "I think, therefore I am;" which appears to him a certain and immovable principle, by means of