http://www.geology.19thcenturyscience.org/books/1858-Whewell-HistSci/README.htm

matical hypotheses, which ought to be considered as mere steps of calculation. "Since, therefore," he continues,[1] "each science has hitherto been a slight and ill-constructed thing, we must assuredly take a firmer stand; our ground being, that these two subjects, which on account of the narrowness of men's views and the traditions of professors have been so long dissevered, are, in fact, one and the same thing, and compose one body of science." It must be allowed that, however erroneous might be the points of Bacon's positive astronomical creed, these general views of the nature and position of the science are most sound and philosophical.

(*Kepler.*) In his attempts to suggest a right physical view of the starry heavens and their relation to the earth, Bacon failed, along with all the writers of his time. It has already been stated that the main cause of this failure was the want of a knowledge of the true theory of motion;—the non-existence of the science of Dynamics. At the time of Bacon and Kepler, it was only just beginning to be possible to reduce the heavenly motions to the laws of earthly motion, because the latter were only just then divulged. Accordingly, we have seen that the whole of Kepler's physical speculations proceed upon an ignorance of the first law of motion, and assume it to be the main problem of the physical astronomer to assign the cause which *keeps up* the motions of the planets. Kepler's doctrine is, that a certain Force or Virtue resides in the sun, by which all bodies within his influence are carried round him. He illustrates[2] the nature of this Virtue in various ways, comparing it to Light, and to the Magnetic Power, which it resembles in the circumstances of operating at a distance, and also in exercising a feebler influence as the distance becomes greater. But it was obvious that these comparisons were very imperfect; for they do not explain how the sun produces in a body at a distance a motion *athwart* the line of emanation; and though Kepler introduced an assumed rotation of the sun on his axis as the cause of this effect, that such a cause could produce the result could not be established by any analogy of terrestrial motions. But another image to which he referred, suggested a much more substantial and conceivable kind of mechanical action by which the celestial motions might be produced, namely, a current of fluid matter circulating round the sun, and carrying the planet with it, like a boat in a stream. In the Table of Contents of the work on the planet Mars, the purport of the chapter to which I have alluded is

[1] Vol. ix. 221.

[2] *De Stellâ Martis*, P. 3. c. xxxiv.