

rary, prevalent, academic voodoo practices.

Kepler, a student of the work of the founder of modern scientific thought, Cardinal Nicholas of Cusa, and also of the brilliant follower of Cusa, Leonardo da Vinci, had begun his attack on the subject of the organization of the Solar system from the standpoint of the concept of *dynamics* as dynamics is presented by the ancient Pythagoreans and Plato.

At the start, Kepler had therefore adopted the view that the ordering of the bodies within the Solar system must be a rational expression of a dynamic (e.g., Pythagorean, Platonic) universe, and, therefore, must have some root-connection to the ordering principle underlying the appearance of an array of the Platonic solids. Foolish commentators propose that Kepler had later abandoned that view. Rather, being an honest and very hard-working fellow, Kepler shifted his line of investigation to other aspects of the matter, for a time, but was then compelled to return to an approximation of something functionally reflecting the Platonic solids' series. It is on the basis of that principle of harmonics that Kepler derived the exact formulation which was rudely

plagiarized, without even an attempt at supporting evidence, by the circles of Isaac Newton.

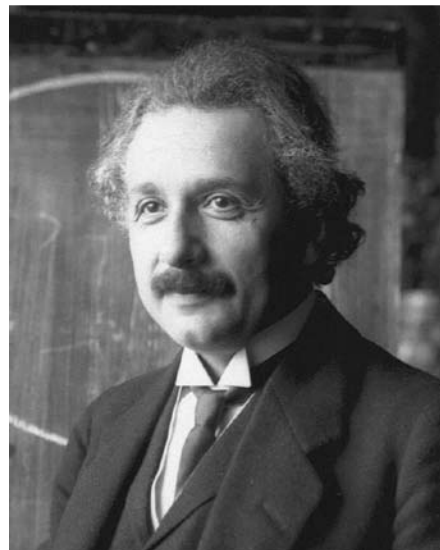
At that point, the usual gossip had abandoned all serious attention to the detail of Kepler's actual discovery of the principle of gravitation, as if Albert Einstein had not traced out the empirical evidence developed by Kepler, evidence which depended upon the ironical juxtaposition of the human senses of sight and hearing. Neither sense, as a sense, could represent the experimental result of the evidence. Human sense-perceptions are merely scientific instruments, as a thermometer is a scientific instrument, which senses usually come with the package delivered with the infant at birth. Gravitation, for example, as a principle, actually exists, as Kepler demonstrated experimentally; it lies outside sense-perception as such. An instrument "counts," so to speak; what is it that is being counted?

The importance, for economy today, of this aspect of Kepler's contribution to the founding of modern science, is that Kepler came to relegate the powers of sense-perception to the status of instrumentation (e.g., harmonics), rather than an expression of the silliness of

Einstein on Kepler

Here are excerpts from an essay by Einstein, in commemoration of the 300th anniversary of Kepler's death. It appeared in the Frankfurter Zeitung on Nov. 9, 1930.

In anxious and uncertain times like ours, when it is difficult to find pleasure in humanity and the course of human affairs, it is particularly consoling to think of the serene greatness of a Kepler. Kepler lived in an age in which the reign of law in nature was by no means an accepted certainty. How great must his faith in a uniform law have been, to have given him the strength to devote ten years of hard and patient work to the empirical investigation of the movement of the planets and the mathematical laws of that movement, entirely on his own, supported by no one and understood by very few! . . .



Ferdinand Schmutzer

One can never see where a planet really is at any given moment, but only in what direction it can be seen just then from the Earth, which is itself moving in an unknown manner around the Sun. The difficulties thus seemed practically unsurmountable.

Kepler had to discover a way of bringing order into this chaos.