

At the close of the sixteenth century, all the Pythagorean and Platonic views of the system of the universe were again reanimated in the person of the imaginative Kepler. He, in the first instance, constructed the planetary system in the *Mysterium Cosmographicum*, in accordance with the principle of the five regular solids, which may be imagined as situated between the planetary spheres, then in the *Harmonice Mundi*, according to the intervals of tone.* Convinced of the regularity of the relative distances of the planets, he believed that he had solved the problem by a happy combination of his earlier and later views. It is extremely remarkable that Tycho Brahe, who in other respects is found to be so strictly attached to actual observation, had already expressed the opinion (controverted by Rothmann) that the revolving cosmical bodies were capable of vibrating the celestial air (what we now call resisting medium) so as to produce tones.† But the analogies between the relations of tone and the distances of the planets, which Kepler so long and laboriously endeavored to trace out, remained, in his opinion, as it appears to me, entirely within the domain of abstract speculation. He congratulated himself upon having, to the greater glorification of the Creator, discovered musical relations of number in the relations of cosmical space; as if, in poetic enthusiasm, he makes "Venus, together with the Earth, sound sharp in aphelion and flat in perihelion; the highest tone of Jupiter and that of Venus must coincide in flat accord." In spite of these merely symbolical expressions, so frequently employed, Kepler says positively, "Jam soni in cœlo nulli existunt, nec tam turbulentus est motus, ut ex attritu *auræ cœlestis* eliciatur stridor.‡ (*Harmonice Mundi*, lib. v., cap. 4.) The thin and clear celestial air (*aura cœlestis*) is also mentioned here again.

The comparative consideration of the planetary intervals with the regular bodies which would fill these intervals, en-

uscript in Leyden, have been minutely treated of with critical erudition by the younger Ideler (*Hermapion*, 1841, pars i., p. 198-214). Compare also Lobeck, *Aglaoph.*, tom. ii., p. 932.

* On the gradual development of the musical ideas of Kepler, vide Apelt's Commentary of the *Harmonice Mundi*, in his work; Johann Kepler's *Weltansicht*, 1849, p. 76-116. (Compare also Delambre, *Hist. de l'Astronom. Mod.*, tom. i., p. 352-360.)

† *Cosmos*, vol. ii., p. 316.

‡ [Now there are no such things as sounds among the heavenly bodies, nor is their motion so turbulent as to elicit noise from the attrition of the celestial air.]