

shown to arise from this theory. There was still a *residual* velocity to be accounted for, which placed dynamical philosophers for a long time in a great dilemma. At length La Place struck on the happy idea, that this might arise from the *heat* developed in the act of that condensation which necessarily takes place at every vibration by which sound is conveyed. The matter was subjected to exact calculation, and the result was at once the complete explanation of the residual phenomenon, and a striking confirmation of the general law of the developement of heat by compression, under circumstances beyond artificial imitation.

(182.) In extending our inductions to cases not originally contemplated, there is one step which always strikes the mind with peculiar force, and with such a sensation of novelty and surprise, as often gives it a weight beyond its due philosophic value. It is the transition from the little to the great, and *vice versá*, but especially the former. It is so beautiful to see, for instance, an experiment performed in a watch-glass, or before a blowpipe, succeed, in a great manufactory, on many tons of matter, or, in the bosom of a volcano, upon millions of cubic fathoms of lava, that we almost forget that these great masses are made up of watch-glassfuls, and blowpipe-beads. We see the enormous intervals between the stars and planets of the heavens, which afford room for innumerable processes to be carried on, for light and heat to circulate, and for curious and complicated motions to go forward among them: we look more attentively, and we see sidereal systems, probably not less vast and complicated than our own, crowded apparently into a small space (from the effect of their distance from us), and forming groups resembling bodies of a substantial appearance, having form and outline: yet we recoil with incredulous surprise when we are asked *why* we cannot conceive the atoms of a grain of sand to be as remote from each other (proportionally to their sizes) as the stars of the firmament; and why there may not be going on, in that little microcosm, processes as complicated and wonderful as those of the