

elasticity. Crystallized substances, according to the results of these experiments, resist compression with different degrees of elastic force, according to the direction in which it is attempted to compress them ; and all the phenomena dependent on their elasticity are affected by this cause, especially those which relate to their vibratory movements and their conveyance of sound.

(266.) There can be little doubt that modifications, similarly depending on the internal structure of crystals, will be traced through every department of physics. In that interesting one which relates to the action of heat in expanding the dimensions of substances, a beginning has already been made by Professor Mitscherlich. It had long been known that all substances are dilated by heat, and no exception to this law has been found, so long as we regard the *bulk* of the heated body. Thus, an iron rod when hot is both longer and thicker than when cold ; and the difference of dimension, though but trifling in itself, is yet capable of being made sensible, and is of considerable consequence in engineering. Thus, too, the quicksilver in a common thermometer occupies a larger space when hot than when cold ; and being confined by the glass ball, (which also expands, but *not so much in proportion*,) it is forced to rise in the tube. These and similar facts had long been known ; and accurate measures of the total amount of dilatation of a variety of different bodies, under similar accessions of heat, had been obtained and registered in tables. But no one had suspected the important fact, that this expansion in crystallized bodies takes place under totally different circumstances from what obtains in uncrystallized ones. M. Mitscherlich has lately shown that such substances expand differently in different directions, and has even produced a case in which expansion in one direction is actually accompanied with contraction in another. This step, the most important beyond a doubt which has yet been made in pyrometry, can however only be regarded as the first in a series of researches which will occupy the next generation, and which promises to afford an abundant harvest of new facts, as well