

regarding the motion of heat in homogeneous metallic spheroids, must be applied with much caution to the actual character of our planet, considering our present imperfect knowledge of the substances of which the Earth is composed, the difference in the capacity of heat and in the conducting power of different superimposed masses, and the chemical changes experienced by solid and liquid masses from any enormous compression. It is with the greatest difficulty that our powers of comprehension can conceive the boundary line which divides the fluid mass of the interior from the hardened mineral masses of the external surface, or the gradual increase of the solid strata, and the condition of semi-fluidity of the earthy substances, these being conditions to which known laws of hydraulics can only apply under considerable modifications. The Sun and Moon, which cause the sea to ebb and flow, most probably also affect these subterranean depths. We may suppose that the periodic elevations and depressions of the molten mass under the already solidified strata must have caused inequalities in the vaulted surface from the force of pressure. The amount and action of such oscillations must, however, be small; and if the relative position of the attracting cosmical bodies may here also excite "spring tides," it is certainly not to these, but to more powerful internal forces, that we must ascribe the movements that shake the Earth's surface. There are groups of phenomena to whose existence it is necessary to draw attention, in order to indicate the universality of the influence of the attraction of the Sun and Moon on the external and internal conditions of the Earth, however little we may be able to determine the quantity of this influence.

According to tolerably accordant experiments in Artesian wells, it has been shown that the heat increases on an average about 1° for every 54.5 feet. If this increase can be reduced

are of a very different temperature from others, in consequence of stellar heat (*chaleur stellaire*)." Thus, according to Poisson, the warmth of the water of our Artesian wells is merely that which has penetrated into the Earth from without; and the Earth itself "might be regarded as in the same circumstances as a mass of rock conveyed from the equator to the pole in so short a time as not to have entirely cooled. The increase of temperature in such a block would not extend to the central strata." The physical doubts which have reasonably been entertained against this extraordinary cosmical view (which attributes to the regions of space that which probably is more dependent on the first transition of matter condensing from the gaseo-fluid into the solid state) will be found collected in Poggendorf's *Annalen*, bd. xxxix., s. 93-100.