

Physical Data as to the interior Constitution of the Earth.

But these oxygenised substances are only such as are found among the bodies at or near the surface of the earth; and though some of these have been elevated from considerable depths by volcanic action, the information thus acquired may not be at all applicable to the interior parts of our planet. Observation is here entirely at fault, and we must be content to remain wholly ignorant of the analytical constitution of the interior masses of the globe. We may never know what chemical or optical properties belong to it; but instead of this kind of knowledge, which, however curious, would be of little value even in theory, we have received some very important instruction from astronomy and general physics, as to the circumstances under which matter, whatever be its chemical constitution, now exists and was formerly aggregated in the interior parts of our planet.

1. Methods have been devised of measuring the attractive force of the whole globe, compared to that of some of its parts, certain mountains, for instance, and thus poising its mass against some known weight; and these methods, confirmed by astronomical inferences, leave no doubt that the density and specific gravity of the globe is nearly five times as great as that of water at common temperatures and pressures. The average specific gravity of the principal stony masses near the surface of the earth is about $2\frac{1}{2}$ times that of water; consequently, the interior parts of the earth are occupied by material substances heavier than those near the surface.

2. But it does not follow that they would be heavier if brought to the surface; for the pressure of the whole mass of the globe toward the centre must necessarily occasion a condensation of the substances, whether solid, liquid, or gaseous, therein occurring. This condensation due to mere pressure would indeed, upon all