

It does not follow, as a consequence of the partial cooling down of the terrestrial mass, that all the gaseous substances composing it should pass into a liquid state ; some of these might remain in the state of gas or vapour, and form round the terrestrial spheroid an outer envelope or *atmosphere* (from the Greek words ἀτμός, *vapour*, and σφαῖρα, *sphere*). But we should form a very inexact idea of the atmosphere which surrounded the globe, at this remote period, if we compared it with that which surrounds it now. The extent of the gaseous matter which enveloped the primitive earth must have been immense ; it doubtless extended to the moon. It included, in short, in the state of vapour, the enormous body of water which, as such, now constitutes our existing seas, added to all the other substances which preserve their gaseous state at the temperature then exhibited by the incandescent earth ; and it is certainly no exaggeration to place this temperature at 2,000° Centigrade. The atmosphere would participate in this temperature ; and acted on by such excessive heat, the pressure that it would exert on the Earth would be infinitely greater than that which it exercises at the present time. To the gases which form the component parts of the present atmospheric air—namely, nitrogen, oxygen, and carbonic acid—to enormous masses of watery vapour, must be added vast quantities of mineral substances, metallic or earthy, reduced to a gaseous state, and maintained in that state by the temperature of this gigantic furnace. The metals, the chlorides—metallic, alkaline, and earthy—sulphur, the sulphides, and even the silicates of alumina and lime ; all, at this temperature, would exist in a vaporous form in the atmosphere surrounding the primitive globe.

It is to be inferred that, under these circumstances, the different substances composing this atmosphere would be ranged round the globe in the order of their respective densities ; the first layer—that nearest to the surface of the globe—being formed of the heavier vapours, such as those of the metals, of iron, platinum, and copper, mixed doubtless with clouds of fine metallic dust produced by the partial condensation of their vapours. This first and heaviest zone, and the thickest also, would be quite opaque, although the surface of the earth was still at a red heat. Above it would come the more vaporisable substances, such as the metallic and alkaline chlorides, particularly the chloride of sodium or common salt, sulphur and phosphorus, with all the volatile combinations of these substances. The upper zone would contain matter still more easily converted into vapour, such as water (steam), together with others naturally gaseous, as oxygen, nitrogen, and carbonic acid. This order of superposition,