

as having their atmospheres similarly distributed to that in the earth's case, because it will confine our search for the cause from a particular to some general law, so that instead of discussing what effects might be produced in the earth's atmosphere by forces peculiar to our situation, we can ignore them as insufficient for more than the production of seasonal and local variations in the same, and look for some general law that would be capable of producing this arrangement in all similarly constituted bodies, or of returning them to it after each disturbance by seasonal or local forces.

In describing the appearance of the earth's atmosphere in its mean condition, I have made use of Sir William Herschell's words when describing the appearance Saturn once unexpectedly presented to him. No one doubts that this was a description of no other than an actual condition of Saturn's atmosphere, because of Herschell's reliability as an observer; besides the appearance was independently observed by others.

The solar corona, as seen during total eclipses, quite frequently occupies a corresponding outline, as photographs and the evidence of eye-witnesses prove. In the case of the remaining members of our system, it is quite possible to assume that, in the cases where their constitution would permit of it, corresponding arrangement of their atmosphere would be found, if their situation in reference to ourselves permitted of sufficiently accurate observation being made to distinguish the same. With this as evidence, we may conclude that there is a tendency in the atmospheres of the sun and Saturn, if not in the remaining members of the system, to return to an outline very closely resembling that of the earth's in its mean annual condition; and it does not seem improbable to suppose that this common condition is a mean one, as in the earth's case.

In a rotating sphere, if we assume all the particles by those forming the periphery gathered at its centre, and at a given instant these particles left free to move under the influence of gravity and the centrifugal force, they will proceed in a direction which is the resultant of these two forces, and with such a velocity in these directions as will permit of their being at the end of any interval of time since they were freed, on the periphery of an oblate spheroid, in which those particles which started from the same meridian of the sphere will be on the same ellipse of the spheroid. It is evident that in accordance with their movements under these forces that the particles of the sphere will reach their solid of equilibrium when the spheroid has been developed. But, in admitting that the spheroid is the solid of equilibrium for these disturbing forces, we have assumed a condition that is not possible in fact, namely, that each particle will move into equilibrium along the resultant of the disturbing forces, and therefore independently of the movement of contiguous particles. Let us see what really does take place: If the movement of the contiguous particles all corresponded with that of the particle we are considering, or if opposite particles had equal and opposite movements, the direction of our particle's movement would be unaltered but its velocity would, because of the decreasing areas that their path would carry them through; motion then in this direction would shortly not be possible, and in consequence have to be taken up along the tangent to the curvature at the particle's position. The result of the movement of a series of particles along the surface of the sphere and in concentric paths, would be their distribution about an equatorial zone, till the aggregation there became so great that further movement along these paths would be no longer possible; then the movement