their salient features pass before the mind in rapid succession. After all, that is as much as we may claim for figures in three dimensions.

Now there are two methods by which we may study four dimensional figures and their possible motions. The first method will be plain to anyone with an acquaintance with elementary Analytical Geometry. We may represent the distances of a point from two perpendicular straight lines or axes by the symbols x and y. If the point moves, x and y change, and if the point moves in a definite way, the motion will be represented by a relation between x and y. Thus, if the point describe a circle with radius r about the point of intersection of the axes, the relation between x and y is $x^2+y^2=r^2$, and every other such relation is some form of curve. Two such relations represent two curves in the plane, and, if they are simultaneous, the pair represents the points of intersection of the curves. Thus we may study the relation and properties of lines in the plane by manipulation of equations in x and y. If we turn to three-fold space, we may represent the position of a point by the three distances, x, y and z. If the point moves, x, y, and z change, and if, according to some definite law, there is the corresponding relation amongst x, y, and z. E.g., a point moving on a sphere of radius r and about the origin or intersection of the three axial lines moves subject to the relation $x^2+y^2+z^2=r^2$, and any other relation amongst x, y, and z is represented by a surface in three-fold space. Two such relations when simultaneous, represent the intersections of these surfaces, so three such relations must represent the points of intersection of the three surfaces. So by manipulation of equations in x, y, and z, we may study the properties and relations of figures in three-fold space. In the same way a relation $x^2+y^2+z^2+w^2=r^2$ represents a four-fold figure so situated that every point is at a constant distance from the intersection of the four-directional axes of four-fold space. Two such relations represent a surface, three, a line, and four the points of intersection of the four figures. Then we may study properties and relations of figures in four-fold space by manipulation of equations in x, y, z, and w, and without any reference to the existence or non-existence of a fourth dimension. If it exists, the results given by this four dimensional analysis are true. This aspect of the subject loses no part of its interest because