theory of gases suggests, we begin to realise the enormous numbers of individual elements of matter with which we have to do in any physical or chemical operation or experiment. The step which enabled mathematicians to calculate molar and cosmical phenomena by looking upon them as made up of an immeasurably, nay infinitely, large number of elementary parts, be these of space or time, was taken by Newton and Leibniz: its result was the invention, development, and application of the infinitesimal calculus. Our fundamental notions applied only to integrals, to a summation of these differential properties. It was the problem of the new calculus to deduce from the simple differential properties, expressed in what is called the differential equation, the results of finite observable quantities. This was done by a process of summation or integration. In this process the elements were, however, all considered to be equal. This was an assumption which, for the purposes of simplicity, might be safely made in a first approximation. When, however, the kinetic theory of gases took seriously into account the motion, velocity, number, and size of the constituent particles of matter contained in any finite measurable volume, or portion of matter, two distinct views presented themselves: the one which looks only at the total or average result and aspect of the phenomena, the other which looks at the actual behaviour and properties of the component parts, be these ever so numerous or ever so small. These latter could no longer be regarded as differentials which lose their independent existence in the process of summation: they had individual properties, which were not lost in the aggregate. It is evident that chemists had been