we apply the counting process to the needs of geometry and physics. We are here confronted with notions which require to be arithmetically defined—the infinite and the continuous. The same notions at the beginning of the century attracted the attention of eminent analysts like Cauchy. It is now clear, thanks to the labours of Prof. Georg Cantor of Halle, that for mathematical purposes we must distinguish between the indefinitely great and the actually infinite in the sense of the transfinite. To deal with the actually infinite, as distinguished from the immeasurably or indefinitely great, we have to introduce new notions and a new vocabulary. For instance, in dealing with infinite aggregates, the proposition that the part is always less than the whole is not true. Infinities, indeed, differ, but not according to the idea of greater and smaller, of more or less, but according to their order, grade, or power (in German *Mächtigkeit*). Two infinities are equal, or of the same power, if we can bring them into a one-to-one correspondence. Prof. Cantor has shown that the extended range of numbers termed algebraic have the same power as the series of ordinary integers—one, two, three, &c.—because we can establish a one-to-one correspondence between the two series—*i.e.*, we can count them. He has further shown that if we suppose all numbers arranged in a straight line, then in any portion of this line, however small, there is an infinite number of points which do not belong to a countable or enumerable multitude. Thus the continuum of numerical values is not countable—it belongs to a different

66. Georg Cantor's theory of the transfinite.