

grade of infinity; it has a higher, perhaps the second, power.<sup>1</sup>

In all these, and in many similar investigations, a conception has gradually emerged which was foreign to older mathematics, but which plays a great and useful part in modern mathematical thought. Older mathematics, ever since the introduction of general arithmetic or algebra, centred in the conception of equality and in the solution of equations. Everything was reduced to magnitude. But there are other relations besides those of magnitude, of more or less. Often in practical pursuits, if we cannot find a counterpart or write down an exact numerical equation, we can gain information by a correspondence. This conception of correspondence plays a great part in modern mathematics. It is the fundamental notion in the science of order as distinguished from the science of magnitude. If older mathematics were mostly dominated by the needs of mensuration, modern mathematics are dominated by the conception of order and arrangement. It may be that this tendency of thought or direction of reasoning goes hand in hand with the modern discovery in physics, that the changes in nature depend not only or not so much on the quantity of mass and energy as on their distribution or arrangement.

With these reflections we touch the limits of mathe-

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<sup>1</sup> A summary of Prof. Cantor's work is given by Prof. Schönflies in the 'Encyklop. Math. Wiss.,' vol. i. p. 184 *sqq.* The importance of accurate definitions and distinctions regarding the infinite and the continuous is dwelt on and

the different recent theories set forth in a very lucid address to the London Math. Society by Prof. Hobson, "On the Infinite and Infinitesimal in Mathematical Analysis," November 1902.