troduction of algebra or general arithmetic, in the application of this to geometry and dynamics, and in the invention of the infinitesimal methods, through which the rigorous theorems of the older geometricians which referred to the simpler figures—such as straight lines, circles, spheres, cones, &c.—became applicable to the infinite variety of curves and surfaces in which the objects and phenomena of nature present themselves to our observation. Logically speaking, it was a grand process of generalisation, based mostly on inference and induction, sometimes merely on intuition.[1] Such a process of generalisation has a twofold effect on the progress of science.

9. Process of generalisation.

The first and more prominent result was the greatly increased power of dealing with special problems which the generalised method affords, and the largely increased field of research which it opened out. We may say that the century which followed the inventions of Descartes, Newton, and Leibniz, was mainly occupied in exploring the new field which had been disclosed, in formulating and solving the numberless problems which presented themselves on all sides; also, where complete and rigorous solutions seemed unattainable, in inventing methods of approximation which were useful for practical purposes. In this direction so much had to be done, so much work lay ready to hand, that the second and apparently less practical effect of the new generalisations receded for a time into the background. We may term

[1] "On se reportait inconsciemment au modèle qui nous est fourni par les fonctions considérées en mécanique et on rejetait tout ce qui s'écartait de ce modèle ; on n'était pas guidé par une définition claire et rigoureuse, mais par une sorte d'intuition et d'obscur instinct" (Poincaré, "L'œuvre math. de Weierstrass," 'Acta Mathematica,' vol. xxii. p. 4).