tained through one and not through the other, if one may be counted toward the valuable degree of bachelor of arts and the other only toward the very inferior degree of bachelor of science or bachelor of philosophy, the two studies are not coordinate – they have not the same academic weight or rank.

The three principal propositions just enunciated lead to consequences which at first sight are repulsive to most men educated in the existing system. For example, it would follow from them that children might not receive the training which their fathers received; that young men educated simultaneously in the same institutions might not have knowledge of the same subjects, share precisely the same intellectual pleasures, or cultivate the same tastes; and that the degree of bachelor of arts would cease to indicate—what it has indicated for nearly three hundred years—that every recipient had devoted the larger part of his years of training to Latin, Greek, and mathematics. Proposals which lead to such results inevitably offend all minds naturally conservative. The common belief of most educated men in the indispensableness of the subjects in which they were themselves instructed, reenforces the general conservatism of mankind in regard to methods of education; and this useful conservatism is securely intrenched behind the general fact that anything which one generation is to impart to the next through educational institutions must, as a rule, be apprehended with tolerable precision by a considerable number of individuals of the elder generation. Hence, a new subject can only force its way very gradually into the circle of arts called liberal. For instance, it was more than a hundred years after the widespread revival of Greek in Europe before that language was established at Paris and Oxford as a regular constituent in the academic curriculum; and physics and chemistry are not yet fully admitted to that curriculum, although Robert Boyle published his "New Experiments touching the Spring of the Air" in 1660, Galvani discovered animal electricity in 1790, Lavoisier analyzed water in 1783, and John Dalton published his "New System of Chemical Philosophy" in 1808. Indeed, so stout and insurmountable seem the barriers against progress in education, as we look forward, that we are rather startled on looking back to see how short a time what is has been.

It is the received opinion that mathematics is an indispensable and universal constituent of education, possessing the venerable sanction of immemorial use; but when we examine closely the matters now taught as mathematics in this country, we find that they are all recent inventions, of a character so distinct from the Greek geometry and conic sections which with arithmetic represented mathematics down to the seventeenth century, that they do not furnish the same mental training at all. As Whewell pointed out forty years ago, modern mathematics—algebra, analytic geometry, the differential and integral calculus, analytical mechanics, and quaternions—has almost put out of sight the ancient form of mathematical science. Leibnitz published his "Rules of the Differential Calculus" in 1684, Newton his "Method of Fluxions" in 1711, Euler his "Institutiones Calculi Integralis" in 1768-70; but Lagrange, Laplace, Monge, Legendre, Gauss, and Hamilton, the chief promulgators of what we now call mathematical science, all lived into or in this century. The name of this well-established constituent of the course of study required for the baccalaureate is old, but the thing itself is new. A brief citation from the conclusion of Whewell's prolix