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GEOLOGY AND ECONOMICS[1]

DURING the century which has just closed, the various branches of natural science, botany, zoology, geology and their relatives, having earlier completed their childhood, attained to the well-rounded development of maturity. Their broad truths were given clear expression; they were widely apprehended; and they became the foundations of various inventions and applications of far-reaching influence upon human welfare. Geology, although closely bound up with agriculture, has, nevertheless, been especially concerned with mining. And justly so, because its contributions to the art of mining have been no more than a filial return, since mining as practised in the middle ages was the parent of geology. Until recent years geology's services to the industry have been chiefly rendered in spreading sound and reasonable ideas regarding the nature and distribution of the useful minerals; in solving the perplexing structural questions affecting their occurrence, and in facilitating the discovery of new fields.

The problems of the production of the metals and non-metalliferous substances, as we know them to-day, are of quite recent growth. High explosives, efficient engines and pumps, steam shovels and the like are all not so old as many men who are still living. They have so greatly reduced costs that practically a new world has opened to the miner. Not only on the surface or near it has he been able to work, but the depths have become accessible, and where the value of the ore justified the ef-

[1] Presidential address before the New York Academy of Sciences, December 19, 1910.