

the one directed by Captain Wheeler, have given catalogues of publications, reports, and maps, in which are lists of a part of the geographical maps published by these surveys. The geological survey of Canada also has published a list of its maps.

For the last forty years especially, geological maps on America have accumulated in large numbers, thanks to the geological surveys instituted either by the general governments or by States and Provinces. The United States, Canada, Mexico, Chili, and a large number of States and Provinces have rivaled each other in this field of science. Memoir after memoir, map after map, has been produced to show the geological structure of countries which yesterday were unknown, but to-day are marshaled in the scientific movement which carries forward in its progress all the nations of the world.

Geology, properly so called, dates only from this century; in the preceding one a few maps, rather mineralogical, than geological, appeared. Such are the maps of L. Coulon in 1664; of Guettard in 1746; of Monnet on France in 1780; of Guettard on North America in 1752; of von Charpentier the elder on Saxony in 1778; of Becker on the Grand Duchy of Nassau in 1778; of von Buch on Silesia in 1797; of Hein on the Thüringen Waldes in 1799; of Christopher Packe on East Kent in 1743; of R. Frazer and J. Billingsley on Devonshire and Somerset in 1794; of Maton on the Western Counties (England) in 1797.

The first geological map is due to the abbé L. Coulon, Paris, 1664. It appeared in a little volume entitled, "*Les Rivières de France*," a very rare work, of which but very few copies exist in the libraries of Paris. In 1683 Martin Lister read a paper before the Royal Society of England entitled, "An ingenious proposal for a new sort of maps of countries; together with tables of sands and clays, such as are chiefly found in the north part of England"; in *Phil. Trans.*, Vol. XIV, p. 739. London, 1684. But it was only a project, which Lister did not carry into execution. The first geological map published in England is dated 1743, almost a century after Coulon's little geological map of France; its title is, "A new Philosophico-chorographical chart of East Kent, invented and delineated by Christopher Packe, M. D." Scale rather more than an inch and a half to the mile, comprising a circle of about 32 miles around Canterbury.

To the celebrated Abraham Gottlob Werner is due, in great part, the coloring of geological maps; for before him several older German mineralogists had used an analogous process. Werner greatly improved not only the classification but also the plan of coloring, and proposed a method "of representing the several formations in distinct, but sober hues, and marking the superior rock by a narrow band of deeper color, along the lines of its contact with the subjacent one" (*Dr. Fitton's Notes on the History of English Geology*, London, 1833). This method of coloring was employed chiefly in Germany, in German Switzerland, a little in Scandinavia, and in England; never in France or in America.