

lations by the beautiful researches of Boussingault and Dumas is one of the brilliant points of modern meteorology.

The extension of physical and chemical knowledge, which we have here briefly sketched, could not fail to exercise an influence on the earliest development of geognosy. A great number of the geognostic questions, with the solution of which our own age has been occupied, were put forth by a man of the most comprehensive acquirements, the great Danish anatomist, Nicolaus Steno (Stenson), in the service of the Grand-duke of Tuscany, Ferdinand II.; by another physician, Martin Lister, an Englishman, and by Robert Hooke, the "worthy rival" of Newton.* Of Steno's services in the geognosy of position I have treated more circumstantially in another work.† Leonardo da Vinci, toward the close of the fifteenth century (probably when he was planning the canals in Lombardy which intersect the alluvial and tertiary formations), Fracastoro in 1517, on the occasion of the accidental exposure of rocky strata, containing fossil fishes, at Monte Bolca, near Verona, and Bernard Palissy, in his investigations regarding fountains in 1563, had indeed recognized the existence of traces of an earlier oceanic animal world. Leonardo, as if with a presentiment of a more philosophical classification of animal forms, terms conchylia "*animali che hanno l'ossa di fuora.*" Steno, in his work on the substances contained in rocks (*De Solido intra Solidum naturaliter Contento*), distinguishes (1669) between (primitive?) rocky strata which have become solidified before the creation of plants and animals, and therefore contain no organic remains, and sedimentary strata (*turbidi maris sedimenta sibi invicem imposita*) which alternate with one another, and cover the first-named strata. All fossiliferous strata were originally deposited in horizontal beds. This inclination (or fall) has been occasioned partly by the eruption of subterranean vapors, generated by central heat (*ignis in medio terræ*), and partly by the giving way of the feebly-supported lower strata.‡ The valleys are the result of this falling in."

Steno's theory of the formation of valleys is that of De Luc, while Leonardo da Vinci, like Cuvier, regards the valleys as

* Sir John Herschel, *Discourse on the Study of Natural Philosophy*, p. 116.

† Humboldt, *Essai Géognostique sur le Gisement des Roches dans les deux Hémisphères*, 1823, p. 38.

‡ Steno, *De Solido intra Solidum naturaliter Contento*, 1669, p. 2, 17, 28, 63, and 69 (fig. 20-25).