

the size of the streams that flowed between the severed escarpments.

He ascertained that, in proportion to their antiquity, the lava-streams had lost, one after another, the usual outward features of the younger sheets. The superficial scorix had disappeared, and the craters were worn away, until only scattered outliers of compact dark rock remained. Yet between this extreme and that of the most recent eruptions, where the lavas, in unbroken, rugged, cavernous sheets, extend from their craters down into the present valleys, where they have driven aside the running streams, every intermediate stage could be found.

Thus the doctrine of the origin of valleys by the erosive action of the streams which flow in them, though it has been credited to various writers,<sup>1</sup> was first clearly taught from actual concrete examples by

<sup>1</sup> Thus by Lyell and Murchison it was ascribed to H. B. de Saussure, Playfair, and Montlosier, *Edin. New Phil. Journ.* vol. vii. (1829), p. 15. In England it has been more commonly assigned to Hutton and Playfair, and to Scrope. The ascription of the doctrine to Montlosier was singularly unfortunate. That writer states that it had been the labour of his life (he was 34 years of age at the time he wrote) to study the valley system of Auvergne, and that he was on the point of publishing his opinion that the valleys have been carved out by the streams which still flow in them, when he discovered that De Saussure had already published the same conclusion. De Saussure's second volume from which Montlosier quotes was published in 1786. But Desmarest's memoir, in which the subaerial origin of the Auvergne valleys was proclaimed, had appeared some twelve years earlier. Montlosier was acquainted with that Memoir, for he cites it more than once. The doctrine of the carving out of valleys by atmospheric denudation became a prominent part of Hutton's theory of the earth. See also *ante*, p. 121, for Guettard's views.