and small crust depressions were exposed where the rocks had offered least resistance to the overlying weight of ice, while large angular blocks were often left in undisturbed position upon the ground-layer of pebble and sand over which the ice-sheet had previously moved.

A very short time after the appearance of Agassiz' work, Canon Rendu, afterwards Bishop of Anneçy, wrote a paper on the physics of glacier ice. He attributed to glacier ice, in spite of its hard and brittle character, a certain ductility which enabled it to mould itself like plastic clay to its surroundings. In this conception Rendu was much in advance of his time, as no observer had thought of any possible connection between plasticity and brittleness.

In the same year, 1841, Charpentier published his *Essai* sur les Glaciers, one of the grandest contributions to the geology of his time. This gifted pupil of Werner, whose pioneer researches in the Pyrenees have already been mentioned, describes in the first part of the essay the phenomena of glaciers with a fine precision, rivalling that of Saussure, and with a completeness far beyond any previous contribution on glaciers. He relies almost exclusively upon his own observations, whereas Agassiz frequently used the accounts in the literature. The second part of the essay is even more important. In it erratic blocks are discussed, and the author brings forward a convincing series of facts, from which he draws his conclusion that only glaciers could have transported the blocks and stranded them in their present positions.

With characteristic modesty, Charpentier claims neither for Venetz nor for himself the authorship of the idea that larger glaciers had formerly filled the Alpine valleys and had left the erratics strewn along them. He relates that uneducated mountaineers, more especially a chamois-hunter, Perraudin, from Lourtier, and a native of Chamonix, Marie Deville, had formed this idea and communicated it orally. He also recalls a remark of Playfair's that had long sunk into oblivion, but was the same in effect as Charpentier's own conclusion.

The hypothesis of a connected ice-sheet, which had been propounded by Agassiz, was not accepted by Charpentier. In the essay, Charpentier explains his arguments against it, and he further insists that the maximum advance of the glaciers occurred after the upheaval and partial subaerial denudation