

followed in less tilted positions. More striking than this scheme of Alpine structure is De Saussure's admirable description of the fan-shaped arrangement of the schists in the Central Alps of western Switzerland, and his proof that the longitudinal valleys and the chains of secondary rock follow the strike of the strata and the continuation of the main ridge, remaining parallel with the leading or central chain. Saussure further set forth the asymmetry of form presented by the Western Alps, in respect of their gradual descent to the Swiss plains on the north side of the Alps, and their abrupt descent on the Italian side. He examined the mineral composition of the rocks, and the alternation, succession, and position of the different kinds of rock. He also studied the topographical, meteorological, and physical relations in the mountains. A permanent addition to the facts of physical geography was made by his height measurements, his observations of electrical atmospheric disturbances, his determinations of the snow-line, rise of temperature in the ground and in the depths of the lakes, his investigations of glaciers, and of the distribution of plants at different altitudes.

It was not until after the publication of the first two volumes of his work that De Saussure became acquainted with Werner's geognostic and mineralogical writings. He welcomed the new methods and additional knowledge supplied by Werner, and promptly tried to apply them in the district he was himself examining. Hence we cannot blame De Saussure when we find in the third and fourth volumes of his work, certain ideas about rock structure and mountain upheaval that appear contradictory to views expressed in the earlier volumes.

De Saussure also changed his opinions more than once about valley-erosion and about the origin of the immense thicknesses of *débris* and pebble deposits in the Rhone Valley and at the foot of the Alps. Like Professor Arduino of Padua, De Saussure was intensely interested in the nagelfluë conglomerates and morainic accumulations and erratic blocks on the outer Alpine slopes, but was no more successful than Arduino in arriving at an explanation. He referred them all to one geological period, during which he thought gigantic intrusions of the crust had taken place, and the waters of the ocean rushing into the crust-basins had fragmented, torn away, and scattered large masses of rock.

With our present intimate knowledge of glaciation, it seems