other parts of Europe bear evidence of subsidence in the many terraced river valleys and sea borders, although never glaciated. Other facts bearing on the question will be found in a recent paper by Prestwich on the late Post-glacial submergence. The ice of the locally glaciated areas over Europe could have depressed isostatically only equal areas to a depth less than two fifths of the mean thickness of the ice.

The insufficiency of the ice-sheet to produce the widely extended Champlain submergence is evident. The only other agency to which appeal has been made is that of the earth's contraction; this makes the movements of the Quaternary one in cause and system.

The Recent period has its epeirogenic movements partly as a continuation of the earlier, and partly as a result, it is believed, of the deposition along coasts and elsewhere of river sediment. The principal facts have been reviewed on pages 341, 367. Another example, of a geanticlinal character, is afforded by the Scandinavian region. A recent report on the subject has been made by L. Holmström (1888). On the west coast, at two localities, in latitudes 57° 53′ N. and 58° 56′ N., the rate of rise of the land, during respectively 66 and 116 years before 1886, was about two inches in ten years; and at another place, in 58° 35′ N., about four inches in ten years. On the east coast, at several localities between 58° 45′ N. and 65° 15′ N., the rate during various intervals from 45 to 139 years before 1867 to 1875, was 1·8 to four inches in ten years; at Stockholm, 1·85 inches; and in Finland, in 63° N., 2·5 to 3·75 inches. The rise is least to the south. The conclusions differ but little from those derived by Lyell from the facts he gathered, during his visit to the coast in 1834.

Moreover, the many fault planes in the earth's crust resulting from old orogenic movements are planes of weakness, and show it from time to time by slips and consequent earthquakes (page 373). It is rendered probable that regions over the Rocky Mountains may still be in slow movement up or down.

Upturned beds occur on all the islands south of New England from Long Island to Nantucket. But although the disturbance has been supposed to be of Quaternary origin, the chief part is of earlier date. The beds of Long Island were first described by W. W. Mather in his excellent account of Long Island geology contained in his New York Geological Report (in quarto) of 1843.

The deposits, as made by Mather and as has since been proved by fossils, are Cretaceous clays, sand and pebble beds with overlying Quaternary drift. The bluffs of 150 to 200 feet along the northern coast have the beds mostly concealed by the fallen debris from above. But part of Mather's investigations were made after a "storm of the 11th and 12th of October, 1836," when the cliffs were laid bare, giving him an unusual opportunity for the study of the stratification. He was led to the conclusion that the flexures are partly local displacements in the clay-beds, due to vertical pressure and slides, and partly a result of upturnings anterior to the drift deposits. This accords with the author's observations over the island. It sets aside the idea that the flexures were in any case an effect of pressure from the moving ice-sheet.

Figs. 1572 to 1575 are from Plate iv. in Mather's Report. The crumplings in Figs. 1572 and 1573 are like those that are made by local pressure or slides, or sinkings of the