In the recent analyses of these waters, the carbonic acid in the Gas spring was found to equal for 1,000 parts, .671 ; of which .278 were required for the neutral carbonates. The Saline spring contained .664 of carbonic acid; of which .290 go to make up the neutral carbonates. The Sulphur spring, in like manner, gave of carbonic acid .573; while the neutral carbonates of the water required only .191. All of these waters, in January 1865, thus contained an excess of carbonic acid above that required to form bicarbonates with the carbonated bases present; while the analyses of the same springs in 1847, showed, as we have seen in § 43, a quantity of carbonic acid insufficient for the formation of bicarbonates. The questions of this deficiency, and of the variation in the amount of carbonic acid in these and other waters, will be considered in the third part of this paper.

§ 48. The waters of our fifth and sixth classes, as defined in § 34, are distinguished by the presence of sulphates; the former being acid, and the latter being neutral waters. In the fifth class the principal element is sulphuric acid, associated with variable and accidental amounts of sulphates of alkalies, lime, magnesia, alumina, and iron. Apart from the springs of this kind which occur in regions where volcanic agencies are evidently active, the only ones hitherto studied are those of New York and western Canada; which issue from unaltered, and almost horizontal Upper Silurian rocks. (§ 31.) The first account of these remarkable waters was given in Silliman's Journal in 1829 (vol. xv, p. 238), by the late Prof. Eaton, who described two acid springs in Byron, Genesee Co., N. Y.; one yielding a stream of distinctly acid water sufficient to turn a mill-wheel, and the other affording in smaller quantities a much more acid water. The latter was afterwards examined by Dr. Lewis Beck (Mineralogy of New York, p. 150). He found it to be colorless, transparent, and intensely acid, with a specific gravity of 1.113; which corresponds to a solution holding seventeen per cent of oil of vitriol. No chlorids, and only traces of lime and iron, were found in this water, which was nearly pure dilute sulphuric acid. Prof. Hall (Geology of New York, 4th District, p. 134) has noticed, in addition to these, several other springs and wells of acid water in the adjacent town of Bergen. Farther westward, in the town of Alabama, is a similar water, whose analysis by Erni and Craw will be found in Silliman's Journal [2] ix, 450. It contained in 1000 parts about 2.5 of sulphuric acid, and 4.6 parts of sulphates, chiefly of lime, magnesia, iron, and alumina. In this, as in