

The composition of the river-waters of Western Europe is well shown by numerous analyses. The substances held in solution include variable proportions of the atmospheric gases, carbonates of lime, magnesia, soda, iron, and ammonia; silica; peroxides of iron and manganese; alumina; sulphates of lime, magnesia, potash, and soda; chlorides of sodium, potassium, calcium, and magnesium; silicate of potash; nitrates; phosphoric acid; and organic matter. The minimum proportion of mineral matter among the analyses collected by Bischof was 2.61 in 100,000 parts of water in the Moll, near Heiligenblut—a mountain stream 3800 feet above the sea, flowing from the Pasterzen glacier over crystalline schists. On the other hand, as much as 54.5 parts in the 100,000 were obtained in the waters of the Beuvronne, a tributary of the Loire above Tours. The average of the whole of these analyses is about 21 parts of mineral matter in 100,000 of water, whereof carbonate of lime usually forms the half, its mean quantity being 11.34.¹²⁴ Bischof calculated that, assuming the mean quantity of carbonate of lime in the Rhine to be 9.46 in 100,000 of water, which is the proportion ascertained at Bonn, enough of this substance is carried into the sea by this river for the annual formation of three hundred and thirty-two thousand millions of oyster-shells of the usual size. The mineral next in abundance is sulphate of lime, which in some rivers constitutes nearly half of the dissolved mineral matter. Less in amount are sodium chloride,¹²⁵ magnesium carbonate and sulphate, and silica. Of the last-named, a percentage amounting to 4.88 parts in 100,000 of water has been found in the Rhine, near Strasburg.¹²⁶ The largest amount of alumina was 0.71 in the Loire, near Orleans. The proportion of mineral matter in the Thames, near London, amounts to about 33 parts in 100,000 of water.¹²⁷

¹²⁴ Bischof, "Chem. Geol." i. chap. v. Of the analyses, chiefly of European rivers, published by Roth, the mean of thirty-eight gives a proportion of 19.983 in 100,000 parts of water. Op. cit. p. 456. Compare I. C. Russell, Bull. U. S. Geol. Surv. 1889.

¹²⁵ On the variations of the chlorine in the Nile and Thames, see J. A. Wanklyn, Chem. News, xxxii. 1875, pp. 207, 219.

¹²⁶ Of the total solid matter dissolved in the water of the River Uruguay as much as about 46 per cent consists of soluble silica, chiefly as hydrated silicic acid. Hence the "petrifying" property of the water. J. Kyle, Chem. News, xxxviii. 1878, p. 28.

¹²⁷ Bischof, op. et loc. cit.; Roth, op. cit. i. p. 454. For composition of British river-water, see "Rivers Pollution Commission Report."