to balance them, but may be supposed, for the sake of clearness, to go into solution as carbonates; now carbonic is a very weak acid, so that these carbonates behave in solution in much the same way as uncombined bases or hydroxides, and give to the water a decided alkaline reaction, which would grow stronger (whereas alkalinity due to calcium carbonate would disappear) on evaporation. As a matter of fact, both calcium and the alkali metals are in solution as bicarbonate rather than normal carbonate, but it is less confusing for present purposes to think of only the latter as present. Alkaline waters, then, are those which may be regarded as containing a clear excess of sodium or potassium carbonate, and alkalinity can, in most cases, be detected from a statement of analysis if there is more carbonic acid reported than would be equivalent to the amount of lime present.

In addition to these mineral derivatives, many organic substances, originating from the decay of animal and vegetable matter, find their way into inland waters. Little is known as to their nature, and a satisfactory quantitative statement of them is an impossibility; moreover, they tend to be rapidly broken down, chemically and bacterially. Hence, generally speaking, solid organic solutes may be neglected by the physiographer. An exception, however, is to be made in the case of peaty waters. These contain humus, a degradation-product of vegetable matter, which is somewhat resistant to oxidative destruction, and is understood to impart an enhanced solubility to iron (in the ferrous state) and to silica. Dissolved in lake waters, humus has the property of inhibiting some forms of animal and plant life, and there is reason to believe that it aids greatly in the decomposition of minerals. It is a substance of high tinctorial power; hence, notwithstanding the strikingly deep colour of many peaty waters, the organic matter dissolved in them is trifling in actual amount. Peaty waters are very common, indeed predominant, in the Scottish rivers and lakes.

The matter held in solution by rivers varies both in quantity and quality with the geology and climate of the drainage area. In temperate climates the majority of river waters tend to a certain normal composition. They contain seldom more than 0·2 part per thousand of total solids, about one-half of which will consist of calcium carbonate held in solution by free carbonic acid; sulphates come next in order of quantity, followed at some distance by chlorides, whilst magnesium and the alkali metals amount to only a few units per cent. This composition stands in glaring contrast to that of sea-salt, in which we have in descending order of percentages chlorine, sodium, sulphates, magnesium, calcium. Various abnormalities in the dissolved matter of river waters may be brought about by special local conditions of the drainage area: not only may the bulk of solutes be considerably increased, but the proportion of certain single