The nature of the changes effected by the percolation of water through subterranean rocks will be best understood from an examination of the composition of spring-water. Springs may be conveniently, though not very scientifically, grouped into two classes: 1st, common springs, such as are fit for ordinary domestic purposes, and, 2d, mineral springs, in which the proportions of dissolved mineral matter are so much higher as to remove the water from the usual potable kinds.

1. Common Springs possess a temperature not higher but frequently lower than that of the localities at which they rise, and ordinarily contain, besides atmospheric air and its gases, calcium-carbonate and sulphate, common salt, with chlorides of calcium and magnesium, and sometimes organic matter. The amount of dissolved mineral contents in ordinary drinking water does not exceed 0·5, or at most 1·0 gramme per litre; the best waters contain less. The amount of organic matter should not exceed from 0·005 to 0·01 gramme per litre in wholesome drinking water.[83] Spring-water containing a very minute percentage of mineral matter, or in which this matter, even if in more considerable quantity, consists chiefly of alkaline salts, dissolves common soap readily, and is known in domestic economy as "soft" water. Where, on the other hand, the salts in solution are calcic or magnesic carbonates, sulphates, or chlorides, they decompose soap, forming with its fatty acids insoluble compounds which appear in the familiar white curdy precipitate. Such water is termed "hard." Where the hardness is due to the presence of bicarbonates it disappears on boiling, owing to the loss of carbonic acid and the consequent precipitation of the insoluble carbonate, while in the case of sulphates and chlorides no such change takes place.

The extensive investigations carried on by the Rivers Pollution Commission in Britain have thrown much light on the relation between the amount of mineral matter in solution in springs and wells, and the character of the under-

[83] Dr. B. H. Paul in Watts' "Dict. Chem." v. p. 1022.