not sufficient to convert all the calcium carbonate to bicarbonate. Deep sea water affords more or less free oxygen. (For Dittmar's results, see Rep. Chall. Exp., on ocean water.)

The *salinity* or proportion of salts varies from dry winds, which tend to concentrate, and from fresh-water streams, which dilute. The area of maximum salinity in the north Atlantic is the Sargasso Sea, a region of calms between 25° and 35° N. and 30° and 20° W., where the specific gravity is 1·0285; while that of minimum is in the region of equatorial rains between 10° N. and the equator. In the south Pacific there is an area of maximum specific gravity (1·02719) about the Society Islands. In general the salinity decreases downward to 800 or 1000 fathoms, and then increases to the bottom. In the south Atlantic the specific gravity at the bottom is 1·0257 to 1·0259, but in the north Atlantic it is 1·02616 to 1·02632 at 2000 to 4000 fathoms (Buchanan). In the Baltic Sea, the salinity is reduced one half or more by the waters from the rivers, and the maximum specific gravity is only 1·0140. But in the Mediterranean, owing to evaporation and an average rainfall of but 30 inches, the specific gravity is 1·0280 to 1·030; and hence the amount of saline matters is about 3·9 per cent to 3·6 for the Atlantic.

The following are analyses of two river waters, and of two mineral springs, from a paper by Professor C. F. Chandler. The Croton River (supplying New York City) is from a region of Archæan rocks; the Mohawk, one of Lower Silurian shales, sandstones, and limestones (underneath); and the two mineral springs arise from the Potsdam sandstone. The amounts of mineral salts are of grains in a U. S. gallon (231 cubic inches = 57,750 grains); also mean of analyses of Arkansas Hot Springs, by R. N. Brackett (Ark. Geol. Survey), temp. 124° and 146·5 F.

	Croton River, N.Y.	Mohawk, Utica, N.Y.		Congress Springs, Saratoga.	Lithia Well, Ballston.	Arkansas Hot Springs.
Potassium chloride.....	—	0·12		8·049	33·276	—
Sodium chloride.....	0·402	0·17		400·444	750·030	0 27
Sodium bromide.....	—	—		8·559	3·643	—
Sodium iodide.....	—	—		0·138	0·124	—
Magnesium chloride.....	—	—	Na. phosphate	0·016	0·050	—
Potassium sulphate.....	0·179	—		0·889	0·520	0·21
Sodium sulphate.....	0·260	0·57	Na. Carb.	10·775	11·928	0·45
Calcium sulphate.....	0·158	1·31	Li. Carb.	4·761	7·750	—
Magnesium sulphate.....	—	—	Ba. Carb.	0·928	3·881	Na_2CO_3 0·04
Calcium carbonate.....	1·648	4·60		143·399	238·156	7·15
Magnesium carbonate....	1·100	1·71		121·757	180·602	1·13
Iron carbonate.....	—	—		0·340	1·581	$FeSO_4$ 0·05
Silica	0·621	0·47		0·840	0·761	2·58
Organic, volatile.....	0·670	1·64		trace	trace	—
Total	5·038	10·68[1]		700·895	1233·240[2]	11·88

Pure water has very feeble solvent action on rocks except in the case of gypsum and anhydrite, which yield 1 part to 400 to 500 of cold water. Quartz, feldspar, and other siliceous minerals are essentially unaffected. Only 2 to 10 parts of calcite are taken up by 100,000 parts. Opal, which is silica in the soluble state (like that of Diatoms, Sponge-spicules, Radiolarians), yields 12 to 15 parts to 100,000 parts of cold water, and much more to warm water.

[1] The analysis afforded also 0·09 of alumina and iron oxide.

[2] This amount contains also 0·867 strontium bicarbonate and 0·077 alumina; and both the Ballston and Saratoga waters afforded a trace of calcium fluoride and sodium biborate. The carbonates in these waters are reckoned as bicarbonates. The Congress Spring afforded 392·289 cubic inches of carbonic acid to the gallon, and the Ballston, 426·114.