

the atmosphere and the sea. The sea gives up portions of its water as vapour, and the atmosphere in its turn gives up portions of its vapour as water; and climates are dry or moist according as the balance is in favour of the one or the other side of this exchange. Were there no currents in the atmosphere or the ocean, there would be a constant distribution of moisture in the air and concentration in the sea water depending on the temperature, subject to diurnal and annual oscillations. This stationary state of things, however, is by no means what is observed: both in the ocean and the atmosphere there are currents of vast dimensions. The great concentrating agency is the trade winds, which, by virtue of their dryness, remove water from the surface of the ocean over which they blow, while, by virtue of their momentum, they mechanically drive the concentrated water into the equatorial area of dilution.

The same remarks refer in a great measure also to alterations produced by changes from the liquid to the solid state, and *vice versa*. Removal of water, whether as ice or vapour, causes concentration; restoration of it causes dilution. Whether the removal is caused by evaporation or congelation, it is to a certain extent localised so as to produce areas of concentration and of dilution.

The cruise of the Challenger lasted three years and a half, and three years of this time were spent between lats. 40° N. and 40° S., therefore the majority of the observations apply to this region. From the surface observations which were made daily when at sea, and from those of other observers, the accompanying coloured map has been constructed. In it the density of the water at 60° F. (15°·56 C. is represented by various colours, as follows:—

Colour.	Density at 60° F.		Salinity in Grammes per Kilogramme.	
	From	To	From	To
Purple, . . . . .	...	Below 1·0250	...	Below 33·713
Light blue, . . . . .	1·0250	255	33·713	34·364
Dark blue, . . . . .	255	260	34·364	35·015
Light green, . . . . .	260	265	35·015	35·665
Dark green, . . . . .	265	270	35·665	36·315
Light red, . . . . .	270	275	36·315	36·965
Dark red, . . . . .	275	280	36·965	37·615
Yellow, . . . . .	...	Above 280	...	Above 37·615