

to 50 leagues. The rapidity of the current is from three to five miles an hour where the stream is narrowest, and is only one mile as it advances towards the north. The waters of the Mexican Gulf, forcibly drawn to north-east, preserve their warm temperature to such a point, that in 40 and 41 degrees of latitude I found them at  $22.5^{\circ}$  ( $18^{\circ}$  R.) when, out of the current, the heat of the ocean at its surface was scarcely  $17.5^{\circ}$  ( $14^{\circ}$  R.). In the parallel of New York and Oporto, the temperature of the Gulf-stream is consequently equal to that of the seas of the tropics in the 18th degree of latitude, as, for instance, in the parallel of Porto Rico and the islands of Cape Verd.

To the east of the port of Boston, and on the meridian of Halifax, in latitude  $41^{\circ} 25'$ , and longitude  $67^{\circ}$ , the current is near 80 leagues broad. From this point it turns suddenly to the east, so that its western edge, as it bends, becomes the western limit of the running waters, skirting the extremity of the great bank of Newfoundland, which M. Volney ingeniously calls the bar of the mouth of this enormous sea-river. The cold waters of this bank, which according to my experiments are at a temperature of  $8.7^{\circ}$  or  $10^{\circ}$  ( $7^{\circ}$  or  $8^{\circ}$  R.) present a striking contrast with the waters of the torrid zone, driven northward by the Gulf-stream, the temperature of which is from  $21^{\circ}$  to  $22.5^{\circ}$  ( $17^{\circ}$  to  $18^{\circ}$  R.). In these latitudes, the caloric is distributed in a singular manner throughout the ocean; the waters of the bank are  $9.4^{\circ}$  colder than the neighbouring sea; and this sea is  $3^{\circ}$  colder than the current. These zones can have no equilibrium of temperature, having a source of heat, or a cause of refrigeration, which is peculiar to each, and the influence of which is permanent.

From the bank of Newfoundland, or from the 52nd degree of longitude to the Azores, the Gulf-stream continues its course to east and east-south-east. The waters are still acted upon by the impulsion they received near a thousand leagues distance, in the straits of Florida, between the island of Cuba and the shoals of Tortoise Island. This distance is double the length of the course of the river Amazon, from Jaen or the straits of Manseriche to Grand Para. On the meridian of the islands of Corvo and Flores, the most western of the group of the Azores, the breadth of the current is