

## MAP II.

### CURRENTS OF AIR AND OCEAN IN CONNECTION WITH CLIMATES; REGIONS OF SUMMER RAINS AND SUMMER DROUGHTS.

THIS MAP is designed to show chiefly the regions of summer rains and summer droughts in North America; the effects of the currents of the air and the oceans on temperatures and rain falls; and the influence of these in producing climates favourable for the productions of the earth. The continent of North America, north of Mexico, is nearly equally divided between Canada and the United States. Canada embraces that part having moderate temperatures, the most uniform rains during the agricultural months, and necessarily the most favourable climates for the production of the chief plants used as food. The arrows on the map indicate the direction of the great currents of the Atlantic and Pacific oceans; the warmer or tropical currents flowing in a north-easterly direction, fall upon and raise the temperatures of western coasts; while the polar currents flow south-westerly down eastern coasts, depressing the temperatures of those parts of the continents.

The prevailing winds in the north temperate zone are from S. W. towards the N. E. This great current of air may be said to be constant north of lat. 35°. In the upper region of the air it blows nearly every day in the year from some point near the South-west towards the North-east. The arrows on the map representing the tropical currents of water also give the direction of the warmer aerial currents. With a constant movement of the air in high altitudes from the S. W. there must be a return current from the north towards the S. W. as there are counter currents in the ocean; but these polar winds near the surface of the earth blow from all points of the compass.

The warm currents of air and water falling upon western coasts, and aerial currents passing over the continents, elevate the temperatures of the western parts of the continents, while the cold currents pressing upon eastern shores, lower the temperatures there.

The mean temperature of the Gulf Stream in the Gulf of Mexico is 80° Fahrenheit; its maximum temperature is 86°, or 9° above the ocean temperature due the latitude. Increasing its latitude 10°, it loses two degrees of heat, and after running 3,000 miles towards the north, still preserves the temperature of summer. With this temperature it crosses the 40th degree of N. latitude, and spreading out for thousands of square leagues over the cold waters of the ocean, does much to mitigate the rigours of winter in Europe. When it strikes the British Islands it divides into two parts, the main current going to the Polar Sea, the other entering the Bay of Biscay.

It has been estimated that the quantity of heat discharged over the Atlantic from the waters of the Gulf Stream in winter, would be sufficient to raise the whole column of atmosphere which rests upon France and the British Islands from the freezing point to summer heat. Every western wind which