

we may perceive the great extent of sea which he explored; and his tract demonstrates, that, if any lands exist in this part of the globe, they must be far removed from the Continent of America; for New Zealand, which is situated between the 35th and 45th degrees, is very distant from America. But it is still to be hoped, that other navigators, following the tract of Captain Cook, will traverse the southern ocean under the 50th degree, and that they will discover whether these immense regions, which extend more than two thousand leagues, consist of land or of sea. However, I do not imagine that the southern regions, beyond the 50th degree, are so temperate that any advantage could be derived to us from the discovery of them.

IV.

Concerning the Invention of the Mariner's Compass, p. 153.

WITH regard to the invention of the Mariner's Compass, I have to add, that, from the testimony of Chinese authors, of which M. le Roufe and M. de Guignes have made an abridgment, it appears to be certain, that the polarity of the magnetic needle has been very anciently known to the inhabitants of China. The figure of these

first compasses was those of a man, who turned upon a pivot, and whose right arm pointed to the south. The time of this invention, according to certain Chinese chronicles, was 1115 years before the Christian æra, and, according to others, 2700*. But notwithstanding the antiquity of this discovery, it does not appear that the Chinese had ever derived from it the advantage of making long voyages.

Homer, in the *Odyssey*, tells us, that the Greeks employed the loadstone to direct their navigation when they went to besiege Troy; and this æra is nearly the same with that recorded in the Chinese Chronicle. Hence we can no longer doubt, that the direction of the loadstone toward the pole, and even the use of the mariner's compass in navigation, were known to the ancients at least three thousand years ago.

V.

Of the discovery of America, p. 155.

To what I said, p. 155. concerning the discovery of America, a critic of more judgment than the author of *Lettres à un Américain*, has accused me of doing a kind of injury to the memory of so great a man as Christopher Colum-

* See l'Extrait des Annales de la China, par Mrs. Roufe et de Guignes.

bus. 'It is confounding,' he remarks, 'Columbus with his sailors, to think that he could believe the sea rose toward the sky, and that they perhaps touched each other on the southern part of the globe.' This criticism is extremely just. I ought to have softened this fact, which I had extracted from some historical relation; for this great navigator, it is to be presumed, must have had very distinct notions concerning the figure of the earth, which he derived both from his own voyages, and from those of the Portuguese to the Cape of Good Hope and the East Indies. It is well known, however, that Columbus, when he arrived at the New Continent, thought himself at no great distance from the east coasts of Asia. As no man, at that period, had circumnavigated the world, he could not know its circumference, and did not imagine that the earth was so extensive as it has been demonstrated by later discoveries. Besides, it must be acknowledged, that this first navigator toward the west, could not fail to be astonished to find, that, when below the Antilles, it was impossible for him to gain the southern regions, and that he was continually forced back. This obstacle still subsists. We cannot, in any season, sail directly from the Antilles to Guiana; because the currents are extremely rapid, and constantly run from Guiana to those islands. Ships sail from Guiana to the Antilles in five or six days; but they require two months

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to return. In order to return, they are obliged to make a large circuit toward the Old Continent, from whence they direct their course toward the Terra Firma of South America. These rapid and perpetual currents from Guiana to the Antilles are so violent that they cannot be surmounted by the aid of the wind; and, as this circumstance is unexampled in the Atlantic ocean, it is not surprising that Columbus, who, notwithstanding all the resources of his genius and knowledge in the art of navigation, could not advance toward the southern regions, should think that something of a very extraordinary nature existed in this place, and perhaps that there was a greater elevation in this part of the sea than in any other; for the currents from Guiana to the Antilles actually run with as much rapidity as if they descended from a height.

The motion of the following rivers may give rise to the currents from Cayenne to the Antilles.

1. The impetuous river of the Amazons, whose mouth is seventy leagues broad, and its direction more to the North than the South.

2. The river Ouassia is likewise rapid, has the same direction, and its mouth is nearly a league wide.

3. The Oyapok is still more rapid than the Ouassia, passes through a greater tract of land, and its mouth is nearly of the same dimension.

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4. The Aprouak has nearly the same extent of course and of mouth as the Ouassâ.

5. The river Kaw is less extensive both in its course and mouth; but, though it issues from a Savannah about twenty-five or thirty leagues from the sea, it is extremely rapid.

6. The Oyak, which is a considerable river, divides into two branches at its mouth, and forms the island of Cayenne. This river, at the distance of twenty or twenty-five leagues, receives another called Oraput; it is very impetuous, and derives its source from a mountain of rocks, from whence it descends in rapid torrents.

7. One branch of the Oyak runs, near its mouth, into the river of Cayenne; and these two rivers, when united, are more than a league broad; the other branch exceeds not half a league.

8. The river of Kouron, which is very rapid, and not above half a league wide at the mouth, without reckoning the Macoufia, which, though it furnishes much water, comes from no great distance.

9. The Sinamari is an impetuous river; it comes from a great distance, and its bed is pretty narrow.

10. The river Maroni, though it be very rapid, comes from a great distance. Its mouth is more than a league broad, and, next to the Amazon, it discharges the greatest quantity of water.

water. It gives rise to no islands; while the mouths of the Amazon and Oronoko are interspersed with a great number.

11. The rivers of Surinam, of Barbiché, of Essequébé, and some others, till we reach the Oronoko, which is a very large river.

By the accumulations of mud and of earth brought down from the mountains by these rivers, it should appear, all the valleys of this vast continent have been formed; in the middle of the continent there are some mountains, most of which have formerly been volcanoes, and are not sufficiently elevated to allow their summits to be covered with snow or ice.

Hence it is apparent, that the united force of all these rivers gives rise to that general current of the sea from Cayenne, or rather from the Amazon, to the Antilles; and that this general current extends, perhaps, above sixty leagues from the eastern coast of Guiana.