

'ing space is occupied by another species, in
'the same manner as has been remarked with
'regard to fossil shells, in a great part of Europe,
'and perhaps every where else. It is by ob-
'servations on the interior parts of earth, and
'on such places as the sea leaves uncovered,
'where we always see particular species reign-
'ing over certain districts, that we have been
'enabled to form some idea of the prodigious
'number of individuals, and of the thickness
'of the banks at the bottom of the sea, of which
'we can only know the surface by our sound-
'ings.

'The accidental or particular bottom is
'composed of immense numbers of the prick-
'les of the sea-urchin; of fragments of shells,
'sometimes corrupted; of crustaceous animals;
'of madrepores; of sea-plants; of pyrites; of
'granites rounded by friction; of pieces of mo-
'ther-of-pearl; of mica; perhaps of talc, to
'which different names are given according
'to their appearances; of entire shells, but
'in small quantity, and seemingly dispersed
'through no great extent; of small flints, some
'crystals, coloured sands, a light slime, &c.
'All these bodies, disseminated by the currents,
'the agitation of the waters, and partly proceed-
'ing from the rivers, from the sinking of hills or
'high beaches, and other accidental causes,
'seldom perfectly cover the general bottom,
which

'which appears every instant, when we found
'often in the same regions. . . . I remarked, that,
'during near a century, a great part of the ge-
'neral bottoms of the Gulf of Gascony and la
'Mancha, have suffered little or no change,
'which supports my opinion concerning the two
'bottoms *.

II.

Of Currents in the Ocean; vol. i. p. 365.

TO the enumeration of currents, we shall add
the famous current of Mosckoe, Mosche, or
Male, on the coast of Norway, of which a learn-
ed Swede has given the following description:

'This current, which took its name from the
'rock of Moschenfiele, situated between the two
'islands of Tofoe and Woeroen, extends four
'miles from north to south.

'It is extremely rapid, especially between the
'rock of Mosche and the point of Lofoe. But,
'in proportion as it approaches the two isles of
'Woeroen and Rouest, its rapidity diminishes.
'It finishes its course from north to south in six
'hours, and from south to north in an equal
'time.

* Journ. de Phys. par M. Abbé Rozier, Dec. 1775, p. 438.

'This

‘ This current is so rapid, that it produces a number of small eddies, which the Norwegians call *gargamer*.

‘ Instead of following the course of the tides, it observes an opposite direction. When the waters of the ocean rise, they proceed from south to north, but the current then runs from north to south. When the sea retires, it goes from north to south, but the current then runs from south to north.

‘ It is remarkable, that, both in going and returning, it does not describe a straight line, like other currents found in some straits, where the waters of the sea rise and fall; but it moves in a circular direction.

‘ When the waters of the sea have risen one half, those of the current run to the south south-east. In proportion as the sea rises, the current turns towards the south; from thence it turns toward the south-west, and from the south-west to the west.

‘ When the tide is full, the current goes toward the north-west, and then toward the north. About the middle of the reflux, the current recommences its course, after having been suspended during some seconds.

‘ The principal phenomenon is its return by the west from the south south-east toward the north. If it did not come back by the same road, it would be difficult and almost impossible

‘ to

‘ to sail from the point of Lofode to the two great islands of Woeroen and Rouest. There are two parishes, which would necessarily be uninhabited, if the current observed not the course I have described. But, as it actually observes this course, those who pass from the point of Lofode to the two islands, wait till the tide has risen one half, because the direction of the current is then to the west. When they want to return from these islands to the point of Lofode, they wait till the tide be half ebb; because the course of the current is then toward the Continent. This circumstance renders the passage very easy. . . Now, there is no current without a declivity; and here the water rises on one side and descends by the other. . . .

‘ To be convinced of this truth, we have only to consider that there is a small tongue of land in Norway which extends sixteen miles into the sea, from the point of Lofode, which inclines more to the west, as far as that of Loddinge, which inclines more to the east. This tongue of land is surrounded by the sea; and, whether during the flux or reflux, the water is always stopt there; because it can have no issue but through six small straits or passages which divide the tongue of land into an equal number of portions. Some of these exceed not half a quarter of a mile in breadth, and sometimes not half so much. Hence they con-

tain

'tain only a small quantity of water. Of course,
'when the sea rises, a great part of the water
'coming to the north is stopt to the south of
'this tongue of land. The waters are, therefore,
'much more elevated toward the south, than to-
'ward the north. When the sea retires, and
'goes toward the south, a great part of the wa-
'ter, in the same manner, is arrested to the
'north of this tongue of land, and, consequently,
'is much higher towards the north than towards
'the south.

'The waters thus interrupted sometimes at
'the north and sometimes at the south, can find
'an issue only between the point of Lofoeede
'and the island of Woeroen, and between this
'island and that of Roueff.

'The declivity of the waters, when they de-
'scend, produces the rapidity of the current;
'and, for the same reason, this rapidity is
'greatest towards the point of Lofoeede. As this
'point is nearest the place where the waters are
'stopt, the rapidity there is likewise greatest; and,
'in proportion as the waters of the current ex-
'tend towards the islands of Woeroen and Roueff,
'their celerity decreases,

'It is now easy to conceive why the current
'is always diametrically opposite to the motion
'of the sea. Nothing opposes the common move-
'ments of the waters, whether they rise or fall.
'But the waters which are stopt above the point
'of

'of Lofoeede can neither move in a straight
'line, nor beyond this point, while the sea has
'not descended lower, and has not, in retiring,
'carried off the waters, which those that are
'stopt above the point of Lofoeede ought to re-
'place. . . .

'At the commencement of the flux and reflux,
'the waters of the sea cannot turn back those of
'the current; but when they have risen or
'fallen one half, they are then enabled to
'change the direction of the current. As it can-
'not then turn toward the east, because the water
'is always stable near the point of Lofoeede, as
'formerly remarked, it must necessarily proceed
'toward the west, where the water is lower*.
This explication seems to be conformable to the
true principles of the theory of running waters.

We must still add the description of the famous
current of Scylla and Charybdis, near the island
of Sicily, concerning which Mr. Brydone has late-
ly made some observations tending to prove that
the violence and rapidity of its movements are
much diminished.

'It was almost a dead calm, our ship scarce
'moving half a mile in an hour, so that we had
'time to get a complete view of the famous rock
'of Scylla, on the Calabrian side, Cape Pylorus
'on the Sicilian, and the celebrated Straits of

* Descript. du Courant du Molékoo, &c. *Journal Etranger*,
Fevrier 1758, p. 25.

the Faro that runs between them. Whilst we were still some miles distant from the entry of the Straits, we heard the roaring of the current, like the noise of some large impetuous river confined between narrow banks. This increased in proportion as we advanced, till we saw the water in many places raised to a considerable height, and forming large eddies or whirlpools. The sea in every other place was as smooth as glass. Our old pilot told us, that he had often seen ships caught in these eddies, and whirled about with great rapidity, without obeying the helm in the smallest degree. When the weather is calm, there is little danger; but when the waves meet with this violent current, it makes a dreadful sea. He says, there were five ships wrecked in this spot last winter. We observed that the current set exactly for the rock of Scylla, and would infallibly have carried any thing thrown into it against that point; so that it was not without reason the ancients have painted it as an object of such terror. It is about a mile from the entry of the Faro, and forms a small promontory, which runs a little out to sea, and meets the whole force of the waters, as they come out of the narrowest part of the Straits. The head of this promontory is the famous Scylla. It must be owned that it does not altogether come up to the formidable description that Homer

Homer gives of it; the reading of which (like that of Shakespear's Cliff) almost makes one's head giddy. Neither is the passage so wonderful narrow and difficult as he makes it. Indeed it is probable that the breadth of it is greatly increased since his time, by the violent impetuosity of the current. And this violence, too, must have always diminished, in proportion as the breadth of the channel increased. The rock is near 200 feet high. There is a kind of castle or fort built on its summit; and the town of Scylla, or Sciglio, containing three or four hundred inhabitants, stands on its south side, and gives the title of prince to a Calabrese family. We lay just opposite to Cape Pylorus where the light-house is now built. . . . The mouth of the Straits, betwixt the promontories of Pylorus in Sicily, and the Coda de Volpe in Calabria, appears scarcely to be a mile. But the channel enlarges to four miles in breadth near Messina, which is twelve miles from the mouth of the Straits. . . . The celebrated gulf or whirlpool of Charybdis lies near to the entry of the harbour of Messina, and often occasions such an intestine and irregular motion in the water, that the helm loses most of its power, and ships have great difficulty to get in, even with the fairest wind that can blow. . . . Aristotle gives a long and formidable description of it in his 125th chapter, De Admirandis, VOL. IX. which

‘ which I find translated in an old Sicilian book
 ‘ I have got here. It begins, “ Adeo profundum, horridumque spectaculum,” &c. but it is
 ‘ too long to transcribe. It is likewise described
 ‘ by Homer, 12th of the *Odyssæy*; Virgil, 3d
 ‘ *Æneid*; Lucretius, Ovid, Sallust, Seneca, as
 ‘ also by many of the old Italian and Sicilian
 ‘ poets, who all speak of it in terms of horror;
 ‘ and represent it as an object that inspired terror,
 ‘ even when looked on at a distance. It certainly
 ‘ is not now so formidable; and very proba-
 ‘ bly, the violence of this motion, continued for
 ‘ so many ages, has by degrees worn smooth the
 ‘ rugged rocks, and jutting shelves, that may
 ‘ have intercepted and confined the waters. The
 ‘ breadth of the Straits too, in this place, I make
 ‘ no doubt is considerably enlarged. Indeed,
 ‘ from the nature of things it must be so; the
 ‘ perpetual friction occasioned by the current
 ‘ must wear away the bank on each side, and
 ‘ enlarge the bed of the water.

‘ The vessels in this passage were obliged to
 ‘ go as near as possible to the coast of Calabria,
 ‘ in order to avoid the suction occasioned by the
 ‘ whirling of the waters of this vortex; by
 ‘ which means, when they came to the narrowest
 ‘ and most rapid part of the Straits, betwixt
 ‘ Cape Pylorus and Scylla, they were in great
 ‘ danger of being carried upon that rock. From
 ‘ whence the proverb, still applied to those who,

‘ in attempting to avoid one evil, fall into ano-
 ‘ ther,

“ Incidit in Scyllam, cupiens vitare Carybdim.”

‘ Here another light-house is placed to warn
 ‘ sailors of their approach to Charybdis, as that
 ‘ other on Cape Pylorus is intended to give them
 ‘ notice of Scylla.*

* Brydone's Tour, vol. i. p. 40. &c.