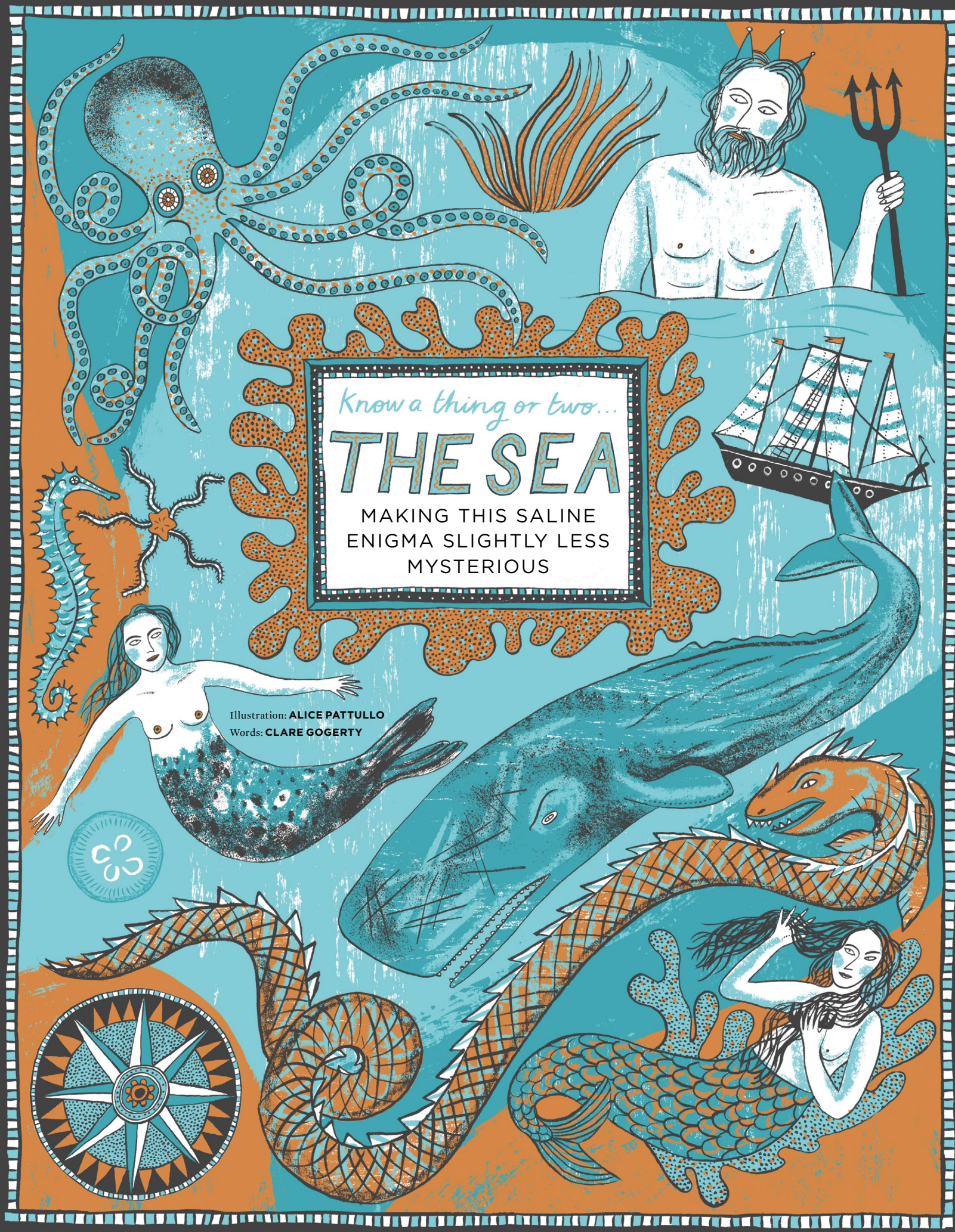

Know a thing or two...
THE SEA
MAKING THIS SALINE ENIGMA SLIGHTLY LESS MYSTERIOUS
Illustration: ALICE PATTULLO
Words: CLARE GOGERTY

Whatever the weather, some sort of centrifugal force propels us to the sea, whether it's to swim in its waters, surf its churning waves, paddle in the shallows, or simply to stand on a clifftop and stare at the vast ocean and its shifting colours. On a warm summer's day, there are few better places to be than lying on a beach towel, a book open but probably unread, listening to the waves tumble and the gulls squawk. It is a combination of elements that soothes and restores the senses.

Perhaps it is the enormity of the sea that continues to draw us. Most of the earth's surface is covered by it, approximately 70%. Even now, only roughly 5% of it has been explored – there are things down there that we will never see or know. Speculation about what lurks beneath has led to many myths and legends springing up. A lone ship adrift on a becalmed ocean or battling mountainous waves is vulnerable to dangers, real and imagined. Sailors and fishermen, only too aware of the unpredictability of the sea, know to treat it with respect and caution, and conjure stories to make sense of it.

Its mutable nature combined with its steadfast majesty has always inspired artists, from sailors scratching scrimshaw on a whale's tooth to JMW Turner blasting his canvas with wild brushstrokes and wind-battered vessels, or Japanese artist Hokusai immortalising a single, enormous wave. Musicians, too – whether it's sailors bellowing shanties on board merchant sailing ships or Claude Debussy or Vaughan Williams trying to capture its shifting moods – are constantly drawn to it.

So it is a sobering thought that the once abundant and limitless ocean is under threat from our mistreatment, in the form of rising plastic pollution, over-fishing and deep-sea dredging. Now, more than ever, is the time to treasure, protect and to enjoy it.

TIDES AND WAVES

TIDES The link between tides and the moon feels magical: how can a planetary body so far away affect our oceans? But it does – the ocean is dragged back and forth by the gravitational pull of the moon and the sun during monthly and yearly orbits. Twice a month, during full or new moons when Earth, sun and moon are in alignment, tidal ranges are larger than average.

Tides are actually huge ocean waves which can be hundreds of miles from crest to crest, yet only a few feet high. Unlike normal waves, which are caused by wind blowing over the water's surfaces, ocean waves are driven by the gravitational attraction towards the moon and the sun. Tides travel across the ocean towards the coastline where they appear as the rise and fall of the sea surface.

WAVES You think you understand waves, then you discover that they aren't made of water at all but energy passing through the water. As wind blows across the sea, it creates a friction with its surface water and this disturbance makes a wave crest. Energy passes through these waves which transmits it across the ocean. There are three types to look out for:

Spilling waves occur when the beach slope is shallow and the wave crumbles at the crests creating fringes of white water.

Plunging breakers occur when the slope of the beach or reef is steeper. This forms a tube before crashing down. These breakers are the 'barrels' that surfers ride inside.

Surging breakers occur when the seabed is steepest. Water sloshes against the steep shore and back down again, like water in a bathtub when you sit down with a thump.

Read more about waves and tides in *The Wavewatcher's Companion* by Gavin Pretor-Pinney (Bloomsbury).

Glossary

A few ocean words that may have puzzled you

The littoral The part of the shoreline between the limits of high and low tides.

The doldrums The belt of ocean approximately five degrees north and south of the equator where typically there is little or no wind.

Gulf Stream A warm and fast-moving ocean current that flows northeastwards from the Gulf of Mexico towards the east coast of America and Newfoundland, before crossing the Atlantic Ocean. A branch continues eastwards towards the UK affecting our weather.

Continental shelf The submerged part of a continental landmass which creates an area of relatively shallow ocean.

Flotsam and jetsam Flotsam is marine debris caused by a shipwreck or accident. Jetsam is deliberately thrown overboard (or 'jettisoned'). Flotsam may only be claimed by the original owner, jetsam by whoever discovers it.

Strandline The mark left by a line of seaweed, shells and other debris washed on to the beach at high tide.

Spring tide Nothing to do with the season, but refers to the 'springing forth' of the tide twice a month during the new and full moon.

Neap tide Occurs seven days after a spring tide when the sun and moon are at right angles to each other. More moderate than a spring tide.

SIX AMAZING SEA CREATURES

The seas around the UK are home to creatures as wondrous as any found in more exotic waters

Long-snouted seahorse *(Hippocampus guttulatus)*
With its protruding spines, downward gaze and prehensile tail, this most beguiling fish looks like a shy, prehistoric ghost. Floating upright, it hangs motionless waiting for its prey to pass, which it then sucks up through its long snout. Found in seagrass habitats from Scotland to Dorset.

Moon jellyfish *(Aurelia aurita)*
Most often seen when masses, known as a 'bloom', are washed up on the beach. Which is a shame, as they look most beautiful floating in transparent clusters. Moon jellyfish can grow up to 40cm in diameter and have short hairy tentacles that hang from their dome like a fringe. They are mostly harmless, though may sting sensitive skin.

Brittle star *(Ophiothrix fragilis)*
This elegant starfish has long slender arms which they can cleverly self-amputate if being attacked; the arms regrow. Brittle stars prefer to live in great gangs (called 'aggregations') on the sea bed, their arms raised to catch plankton; can number up to 1,500 per square metre. Usually in deep water but sometimes under boulders and in rockpools.

Snakelocks anemone *(Anemonia viridis)*
Unlike other anemones, Snakelocks anemone's bright-green tentacles remain out all the time: all the better to sting and capture small fish. They can be found on the seabed, attached to large seaweeds, and in sunny rockpools, where their flowing tentacles with their purple tips sift through the passing currents.

Goose barnacle *(Lepas anatifera)*
Attached to rocks and other objects by a long black penduncle and with a chalky white shell which opens to reveal spiky fronds, this unusual creature has an alien-like quality.

Spiny spider crab *(Maja squinado)*
Often disguised by seaweed and sponges that grow all over it, this large knobbly crustacean has long-jointed legs, small claws and spiky shell. It can be found in South and West England and its sustainable numbers mean it's increasingly eaten in the UK, although most are exported to France and Spain.

The five oceans

Although all the oceans are interlinked, the enormous body of water on Earth is separated into five oceans, each with its own characteristics. Let's start with the biggest...

Pacific Lying between the eastern coastlines of Asia and western coastlines of the American continent, this has the longest shoreline and constitutes about 46% of the Earth's ocean waters.

Atlantic Contained by Europe and Africa in the east and by America in the west, and includes the Baltic Sea, Black Sea, Caribbean Sea, Mediterranean Sea and Gulf of Mexico and the North Sea. It is the saltiest ocean.

Indian Between Africa, the Southern Ocean, Asia and Australia; home to major sea routes connecting the Middle East, Africa and Asia with Europe. Relatively warm.

Southern Also known as the Antarctic Ocean, it surrounds the Antarctic continent, and begins south of latitude 60 degrees south.

Arctic Surrounding and covering the North Pole, north of latitude 60 degrees north, and bordering North America and Europe, the Arctic Ocean is our smallest and shallowest. Home to sea ice, on average 3m thick.

THE BOUNTIFUL OCEAN

With over-fishing and pollution, our marine food supply is under threat. With a little care, though, it is still possible to feast on the sea's nutritious and tasty harvest

Sea salt Unlike processed salt, minerals including potassium, magnesium and calcium have not been removed from sea salt. The result is a clean, intense flavour favoured by chefs. If you are concerned about the amount of salt in your diet, remember that only about about 5% of the salt we consume is added by us: the rest is in processed foods.
Try: cornishseasalt.co.uk; maldonsalt.co.uk.

Seaweed The Japanese have always known the nourishing value of seaweed, which is rich in minerals and vitamins as well as protein and carbohydrates, and now we are finally cottoning on. Edible species on the UK coast, including dulse, laver and gutweed, are available for the responsible shoreline forager and can be used in soups and fish stews. Or buy dried seaweed online.
Try: justseaweed.com; atlantickitchen.co.uk.

Fish and shellfish We all know about the benefits of eating fish – it is high in Omega-3s, low in fat – which makes it a key part of the diet for most of us. Eating it these days is not as simple as it was, though, due to shortage of some species. To source sustainable fish, consult the Marine Conservation Society's Good Fish Guide (mcsuk.org) or download its useful Good Fish Guide app.

SEA MYTHS, TALES AND LEGENDS

From the kraken to Jaws, what may or may not lurk in the depths has sparked myriad tales of heroism, doom and terror

THE SELKIE-FOLK

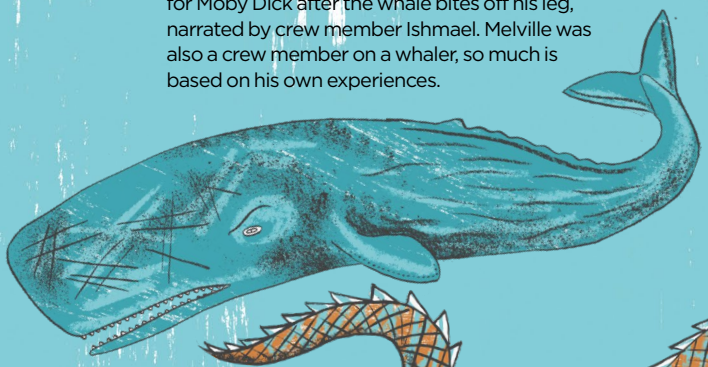
Stories about these shapeshifting creatures, found in Orkney and Shetland, are generally doomed romances. Selkies live in the ocean as seals but transform into humans by shedding their skin. They can only return to the sea by putting their skin back on: if it is lost or stolen they are doomed to live as humans. Once on land, male selkies – notoriously handsome and seductive – often get involved with women. When they go back into the ocean, the women contact them by shedding seven tears into the sea. Female selkies are similarly attractive, and men have been known to steal their seal skin to stop them returning to the water.

MOBY DICK

This classic story of obsession and revenge by Herman Melville is based on a true story of *The Essex*, a whaler that sank after being attacked by a sperm whale in 1820. It tells of Captain Ahab's steadfast hunt for Moby Dick after the whale bites off his leg, narrated by crew member Ishmael. Melville was also a crew member on a whaler, so much is based on his own experiences.

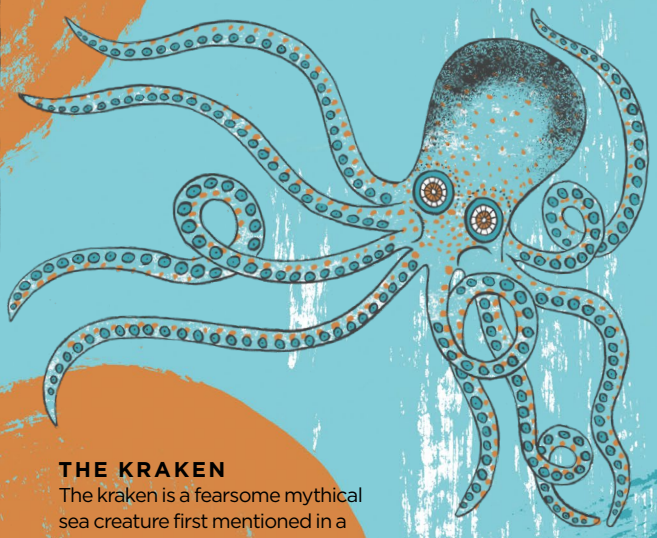
NEPTUNE

The Roman god of the sea and freshwater (Poseidon in Greece) is often portrayed as an older man with a beard (although in fine physical form), carrying a trident and borne in a chariot by sea creatures. His unpredictable, sometimes violent nature is like the sea and like earthquakes, which he also represents. He appears in much classical sculpture, mosaics and on ship's figureheads.



LEVIATHAN

Like the kraken (see left), this scaly creature is intent on bringing destruction upon seafaring vessels. Resembling a serpent with glowing eyes, it is mentioned several times in the Old Testament, particularly in the Book of Job (42: 15–32), which has a long and detailed description of it and its power ('He makes the depths boil like a pot'). He is often depicted as having seven heads and as representing Satan, and is vanquished by God.



THE KRAKEN

The kraken is a fearsome mythical sea creature first mentioned in a 13th-century Icelandic saga and featuring in Norse mythology. This huge, tentacled monster surges up from the sea and wraps itself around sailing ships, dragging the vessel and all its occupants into the water. Its origin is probably the giant squid, which can grow up to 13 metres, and has the largest eyes of any living creature.

MERMAIDS & SIRENS

Many of the fabulous creatures that recur in sea myths are females with destruction on their minds. In Greek mythology, sirens – often portrayed as having women's heads but bird's feathers and scaly feet – lured sailors to the death with their enchanting music and singing. A German version, Lorelei, a nymph, sits on a rock singing tempting songs that distract fishermen who crash their vessels and drown.

Like sirens, mermaids – part-human, part-fish – call to sailors from the sea. The sailors, smitten by their song, fall in love with them and are dragged underwater, where they drown.