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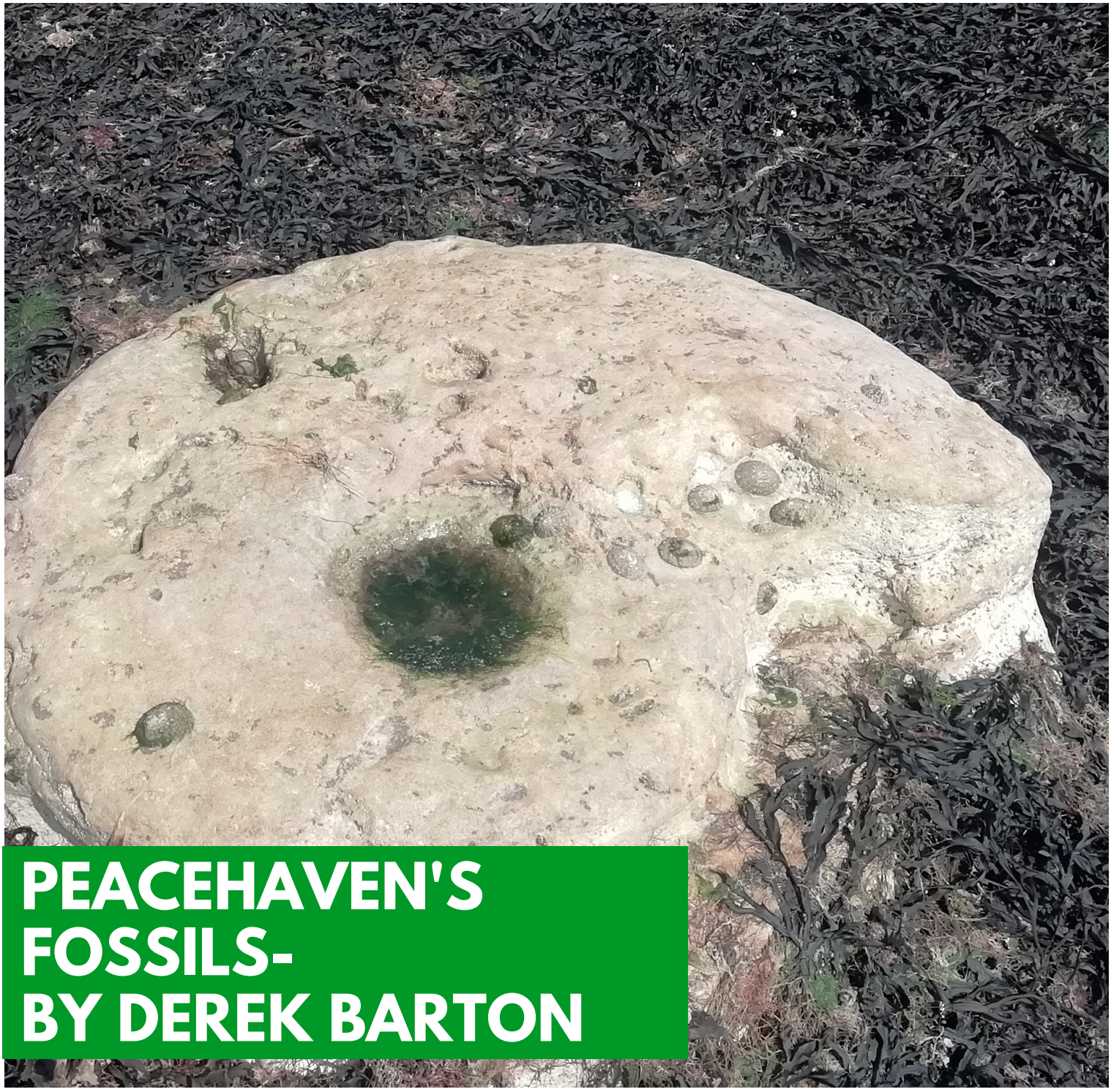
HISTORY SUPPLEMENT



PEACEHAVEN'S FOSSILS- BY DEREK BARTON

Making Peacehaven a better place to live, work and visit

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CHALK, FOSSILS, AND OTHER THINGS

Peacehaven is barely 100 years old, but the chalk on which most of the town is founded was laid down as a soft white mud in a warm tropical sea about 80 million years ago, towards the end of the Cretaceous period. The chalk is composed mainly of the microscopic skeletons of calcareous plankton called coccoliths, which rained down on the sea floor and were gradually turned into soft white rock by a process known as lithification. This is a complex process involving burial, heat and pressure which squeezed out all the water and cemented all the grains together.The soft rocks were then uplifted, folded and fractured as a result of the African continental plate colliding with the European plate when the Alps were formed. Later, these new uplands were eroded and sculpted by periglacial processes – freezing and thawing of the ground when thick ice covered much of the UK.In recent millennia, the sea has been responsible for carving out the vertical chalk cliffs and wave-cut platform that we see today.

Geologists originally divided the chalk into three: the Lower Chalk, typically grey or buff and containing lots of clay; the Middle Chalk, typically a very white chalk containing few flints; and the Upper Chalk, a white chalk with lots of flints. Distinctive fossils enabled those divisions to be subdivided. However, following detailed studies of the chalk from the mid-1970s onwards, the Middle and Upper Chalk are now just known as the White Chalk, which is subdivided by the appearance and properties of the groups of beds, and individual beds.

Locally, we have part of the White Chalk known as the Newhaven Chalk. Some distinctive beds or layers can be traced for hundreds of miles across the UK and France.

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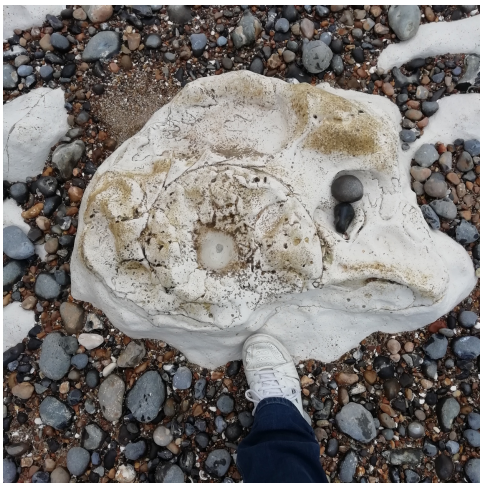
If you venture to the Peacehaven Undercliff you can find fossils. The most dramatic of these are giant ammonites known as Parapuzosia, which are exposed between Friars Bay and the Bastion Steps as the tide goes out. They are related to the modern nautilus and can reach over 1m in diameter, much bigger than those found in Dorset and Yorkshire. The cliffs and foreshore are a designated Site of Special Scientific Interest so it is illegal to hammer or remove them. Sadly, the sea is gradually wearing them away but there are still plenty to find.

Two Parapuzosia are illustrated here, with a size 11 trainer for scale;



The flint in the chalk is believed to originate from the dissolved and re-precipitated silica found in sponges that inhabited the sea floor. Sometimes, the sponges themselves are preserved inside the flints and very often, when the flint is broken, the inside wears away to form a geode or, if the hole goes right through, a ‘hagstone’.

Hagstones play a huge part in Western European folklore, offering the owner protection against snake bites or evil sprites.

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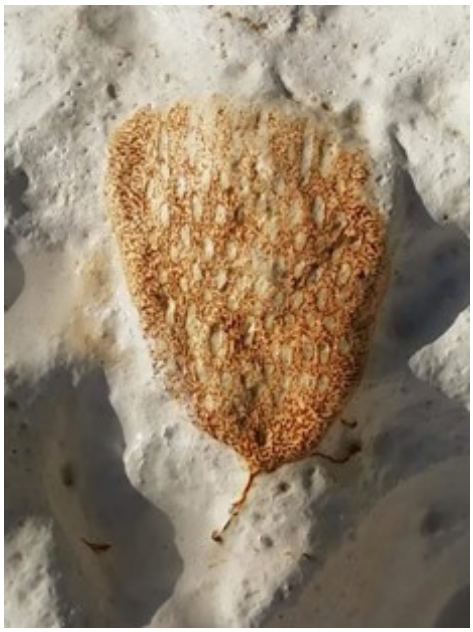
Like the sponge you have in your bathroom, fossil sponges can be quite globular or disc shaped. Some, however, can be preserved as a rusty impression on the old seabed. Found at low tide a few weeks ago, the beautiful fan-shaped one illustrated is known as Ventriculites.



Sea urchins or echinoids are one of the fossils most commonly found preserved in flint on the beach. Searching for them can be a bit hit-or-miss; you need to get down close to the pebbles and be patient. For every complete one, you will find others that are broken, squashed or nearly worn away. The three I'm holding are heart-shaped urchins known as Micraster, which show the characteristic five arms.

They have fascinated people since prehistoric times and are sometimes found in Neolithic burials. The Romans referred to them as 'snakes' eggs'.

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Helmet-shaped echinoids such as this Echinocorys are known as ‘shepherd’s crowns’ in folklore. Amongst other benefits, if they were placed around the fireplace, they were supposed to protect your house against lightning. In the kitchen, they would ensure your bread would rise and, if placed on the dairy shelf, they would stop your milk turning sour.

Bivalves are often found in the chalk. These are a very characteristic Cretaceous oyster known as Inoceramus. Like modern oysters, their shape can vary. Broken bivalve shells make the chalk very gritty at some levels.

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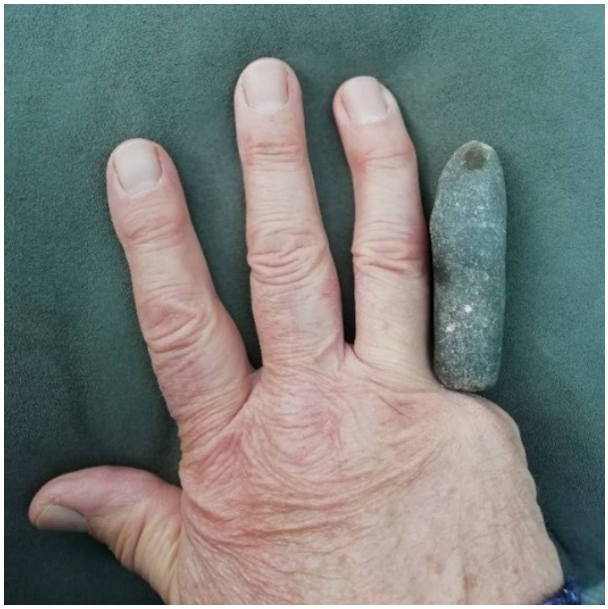
Whilst the ammonites grew huge in the warm tropical sea, corals were struggling to survive and are not commonly found in the Peacehaven chalk, and certainly not as reefs. Here is a tiny solitary coral, known as Parasmilia, which I found beside the Bastion Steps.

Flints can resemble many things such as teeth and fingers. Elongate flints are sometimes the infilling of burrows on the old sea floor.

Flints that look like fossils are called pseudo-fossils, but they can be fun to collect.



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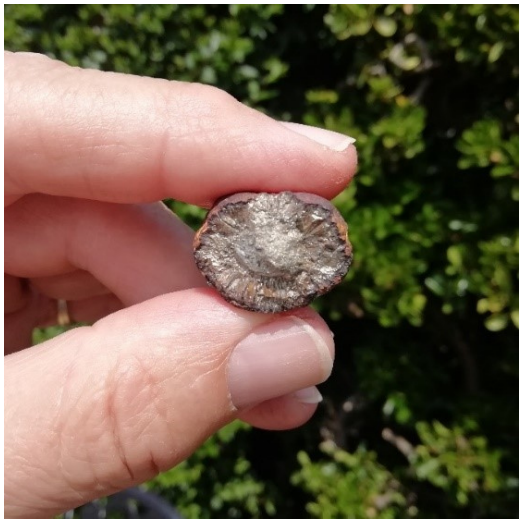
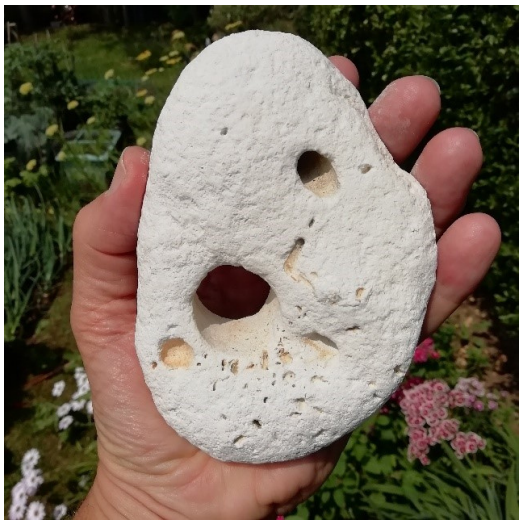
Collectors often think they have found a meteorite when they pick up heavy rusty nodules that can be broken open to reveal radiating silvery crystals inside. These are, in fact, marcasite nodules, a form of iron pyrite, related to fool's gold, commonly found in the chalk.



The chalk can be full of holes and these are not necessarily fossils but the homes of the modern marine fauna. The larger holes are due to rock-boring molluscs called piddocks, and boring worms called polydora make some of the smaller holes. There is even a sponge, cliona, that grinds and etches its way into the soft chalk.



Collecting fossils is great fun, but if you and/or your children go down to the Undercliff, do be careful. The steps and rocky chalk foreshore are very uneven and slippery. Be aware of the tide, and keep away from the unprotected cliffs!

Derek is a retired geotechnical engineer, a fossil collector, and a long-term resident of Peacehaven. We thank him very much for this interesting article.