



Puddingstone

One of the world's most unusual rocks

Throughout Essex can be found large boulders, some hidden in grass verges or churchyards, others standing upright by farm gates or at road junctions. They are known as glacial erratics and were scattered across Essex by glaciers and rivers during the Ice Age. Some are of exotic rock types originating as far away as Scotland or even Scandinavia. The most common boulders, however, did not come very far and these are blocks of hard, pale sandstone known as sarsens (see GeoEssex Factsheet No. 1). Another common rock type looks from a distance like concrete but it is nothing of the kind. This rock is called **puddingstone** and is the most interesting of our Essex erratics.

Named after its resemblance to a plum pudding, puddingstone is a type of rock called a **conglomerate** and is made up of well-rounded flint pebbles, up to 5 centimetres (2 inches) in diameter, bound together in a hard, quartz 'cement', or matrix. Puddingstone is a unique rock and easily distinguished from concrete by the extreme hardness of the matrix. What makes puddingstone special is that it is homogeneous - the pebbles and the enclosing matrix are the same hardness - therefore when a piece of puddingstone is broken the plane of fracture passes through, rather than around, the pebbles. This is very significant and means that it is an unbelievably tough rock.

Puddingstone has the same origin as sarsen stones, in fact sarsens have been described as puddingstone without the pebbles. They are both extremely hard rocks originating in or close to Essex and known collectively by geologists as **silcretes**, which simply means that they are cemented by silica (quartz). The pebbles in puddingstone were originally flint nodules, which were stripped from the Chalk by millions of years of erosion and pounded together on beaches that have long since vanished. These ancient rounded beach pebbles were then laid down as pebble seams of the Reading Beds about 55 million years ago and later raised above sea level. Around this time the climate of Essex was very warm and water, containing dissolved silica, was drawn to the surface. The pebble beds became cemented by silica (in the form of quartz) to form this tough conglomerate that we now know as puddingstone.

Puddingstone is usually called 'Hertfordshire puddingstone', as the blocks that are found in Essex most probably originated in Hertfordshire (a quarry near St. Albans still shows a layer of puddingstone 'in-situ') and were brought to Essex by a previous course of the River Thames.

A rock that has been confused with puddingstone is **ferricrete**, an iron-cemented flint gravel, but the two rocks are easy to tell apart. In ferricrete the flint pebbles are



A polished slice of puddingstone from Stanway near Colchester. Photo: G.Lucy

cemented together by iron-stained sand whereas puddingstone is a much harder rock whereby the sand between the pebbles has been completely turned to a solid mass of silica (quartz) with no visible sand remaining.

Puddingstone must be one of the most instantly recognisable rocks; when cut and polished it can also be one of the most attractive, having a great variation in colour - mostly due to staining by oxides of iron (brown, red, yellow, orange and pink have been known, and the pebbles often have zones of different colours). Because it takes a high polish it has been turned into decorative items (an example being Victorian snuff boxes) and fine pieces of jewellery since at least the early 18th century; it is still so used today. Puddingstone has also been traded around the world; it was reported that a specimen was on display in the gemstone collection of the Hermitage Museum in St. Petersburg, thought to be a gift from Queen Victoria to the Tsar of Russia.

The erosive power of the Thames, flowing far north of its present course, carried large boulders of puddingstone into Essex. Puddingstone occurs as boulders at many roadside locations particularly in north-west Essex between Harlow and Saffron Walden and in central Essex, along a line between Waltham Abbey and Chelmsford, but smaller pieces turn up in gravel pits or on the surface of ploughed fields. It has been found further afield such as the boulder at Stifford in Thurrock and the magnificent example in the middle of a Colchester housing estate. Pieces of puddingstone could turn up anywhere along the former course of the Thames which accounts for it also appearing on Norfolk and Suffolk beaches.



A puddingstone boulder beside a cottage in White Notley, near Braintree. Photo: G.Lucy

Puddingstone has been the subject of many superstitions, one of which was that it grew in the soil, hence the name 'growing stone'. This belief has led to fine examples being destroyed out of fear that they might eventually block rivers or destroy crops. Puddingstone has had practical uses, particularly in Roman times when its great hardness made it useful for making querns for grinding corn. Stone Age man also knew of puddingstone - in Colchester Museum is a puddingstone hand axe from Braintree.

Further reading

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