

Notes on the Porcelain in Christchurch Mansion, Ipswich, 06.04.16

'Hard-paste' and 'Soft-paste' porcelain

Paste forms the 'body' (the matrix) of porcelain, with flux forming the fusible component.

'Hard-paste' porcelain is made of natural materials – a mixture of kaolin (china clay) and china-stone. Kaolin gives plasticity to the mixture and china-stone gives the body its translucency. Its contained alkalis, chiefly potash and soda function as a flux. It is fired at very high temperatures, around 1,400°C. Such porcelain is generally hard and fractured surfaces are smooth and curved.

'Soft-paste' porcelain contains artificial materials. Glass (fritted) is important, other materials include clays, feldspar and bone-ash. It is fired at a lower temperature (1,100°C – 1,200°C), and when working it, is less malleable than hard paste. Such porcelain is generally soft, more granular and gritty and has irregular fracture.

Specimens in the China and Glass Room

Teapots in first case on right (on entering from the Main Hall)

Worcester teapot (on top shelf)

There are great differences in hardness of items from the Worcester Works. Three different soft pastes were used with steatite from Mullion in Cornwall, or whitening (chalk) and pipe clay, or bone-ash. A glassy frit was used in all of them.

Bow teapot (on top shelf)

The Works at Stratford-le-Bow, Essex, were called New Canton (after Canton in China). Soft-paste was made with 'unaker' china clay or bone-ash.

Bristol teapot (on middle shelf)

Both soft-paste and hard-paste items were made. Hard-paste from the Bristol Works is of extraordinary hardness and refractoriness. Being made from china clay and china-stone it has a composition approaching quartz. Some Bristol porcelain has a remarkably small proportion of lime and alkalis (the fluxing or fusible component), less than in fine China porcelain 6%, or Dresden 6.3%. Having a very high proportion of silica, the Bristol paste required high temperature in the kiln. In the Alexandra Palace fire of 1873, the Bristol-made items survived without damage when all other china was destroyed.

'Lowestoft Porcelain' case

A soft porcelain, although the paste is not so soft as that of Bow. There are specks and black spots on most pieces of Lowestoft porcelain. A Norwich Geological Society excursion to Corton on 05.04.1878 was led by J H Blake of the Geological Survey, who showed the party a bed of fine loam in the sands in the cliff. It was thought probable that a continuation of that deposit, or similar to it, was that worked inland many years previously for the manufacture of Lowestoft Pottery.

'Chinese Style' case (middle shelf)

A soft-paste porcelain piece from the Liverpool works. The constituents of Seth Pennington's 'china' were Bone-ash, Lynn sand, and flint (these were fritted together) and clay (nature not specified) which was added afterwards.

Some constituents of Porcelain Pastes

Kaolin (China Clay)

Formed from alteration of minerals, notably feldspars, containing alumina. Examples include from decomposition of granite in Cornwall and Devon, and the 'unaker' from North America (Cherokee land) as used in Bow. Analysis of pure example: silica 46%, Alumina 39.5%, Water 14%, Magnesia, lime, potash, soda and iron 0.5%.

China-Stone

Commonly an altered granite, with slightly altered feldspar, a micaceous material, silica (quartz) and some kaolin. This is the 'petuntse' of some authors. Silica is the principle constituent, followed by alumina.

Frit

Produced by 'fritting' (heating) powdered glass.

Feldspar

Silica compound of alumina and alkalis (chiefly potash and soda). Norway was a major source for porcelain manufacturers.

Bone-Ash

Prepared by calcining (burning) animal bones and grinding to a fine powder. South America was a major source of supplying bones. Bone-ash is a characteristic ingredient of soft-paste English china, giving it a phosphatic body.

Steatite (soapstone)

A silicate of magnesia. Used for a soft paste which would not crack when boiling water poured into a teapot.

Flint

Pebbles were calcined (heated), turning them white and more amenable to crushing and grinding.

Notes

Sillimanite (aluminium silicate) is used to make sillimanite – or aluminium porcelain (fired at high temperature) insulators for spark plugs and laboratory ware.

Glazes (outer skins) are not dealt with here.

The terms 'China' and 'Porcelain' may be used in other ways by authors.

Visit the Wolsey Art Gallery, next to the China and Glass Room, to see:

'The Mill Stream' by John Constable

Note the human intervention on the natural watercourse -a mill structure; straightened channel; changes to the riverbank.

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