

**Catalogue of specimens illustrative of the composition and manufacture of British pottery and porcelain : from the occupation of Britain by the Romans to the present time / by Sir Henry De La Beche, C.B., director, and Trenham Reeks, curator.**

**Contributors**

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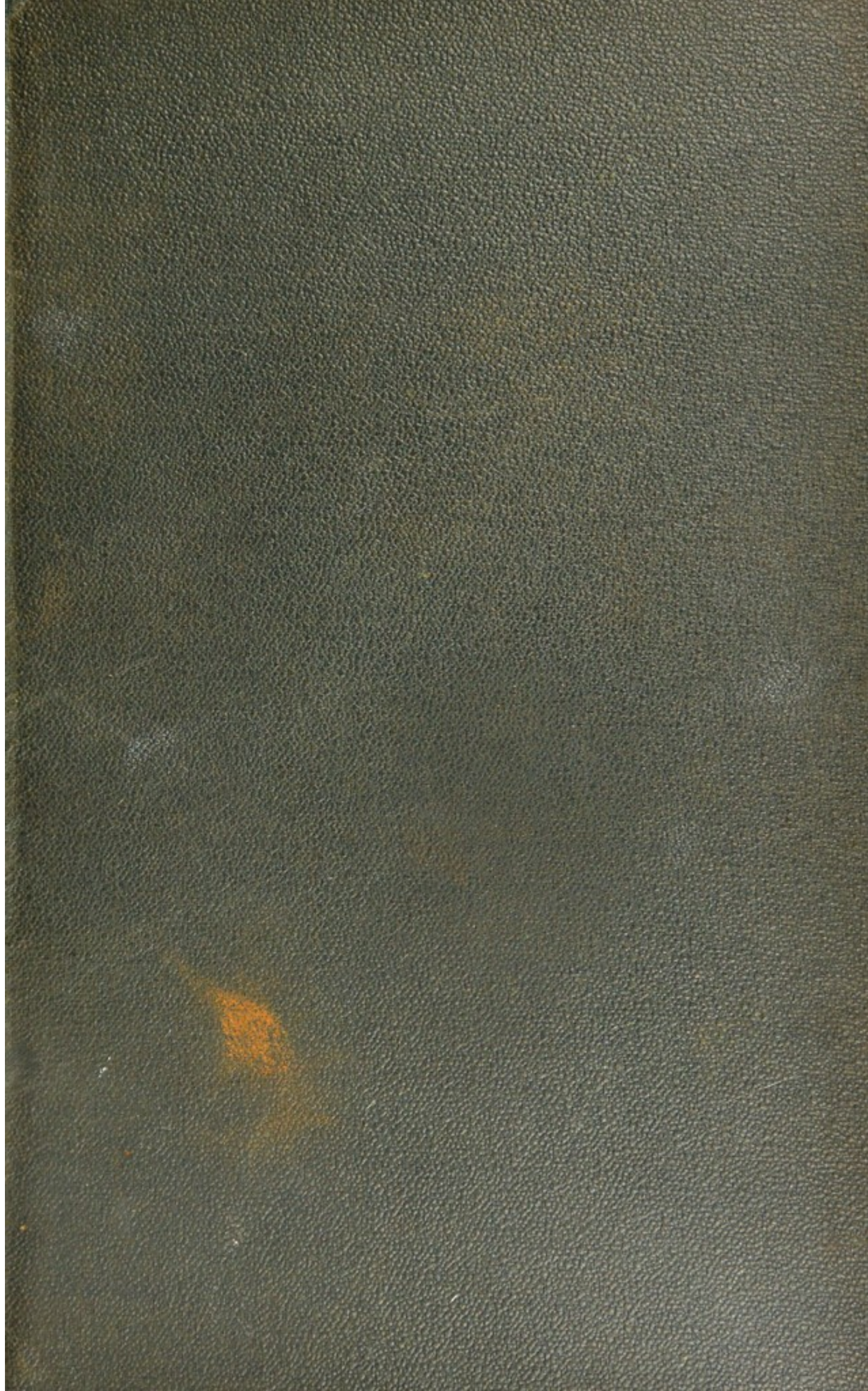
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MUSEUM OF PRACTICAL GEOLOGY.

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CATALOGUE OF SPECIMENS

ILLUSTRATIVE OF THE

COMPOSITION AND MANUFACTURE

OF

BRITISH POTTERY AND PORCELAIN,

FROM THE OCCUPATION OF BRITAIN BY THE ROMANS  
TO THE PRESENT TIME.

---

BY

SIR HENRY DE LA BECHE, C.B.,

DIRECTOR,

AND

TRENHAM REEKS,

CURATOR.

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LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY;

AND SOLD AT THE MUSEUM.

1855.

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*Price One Shilling.*



## N O T I C E.

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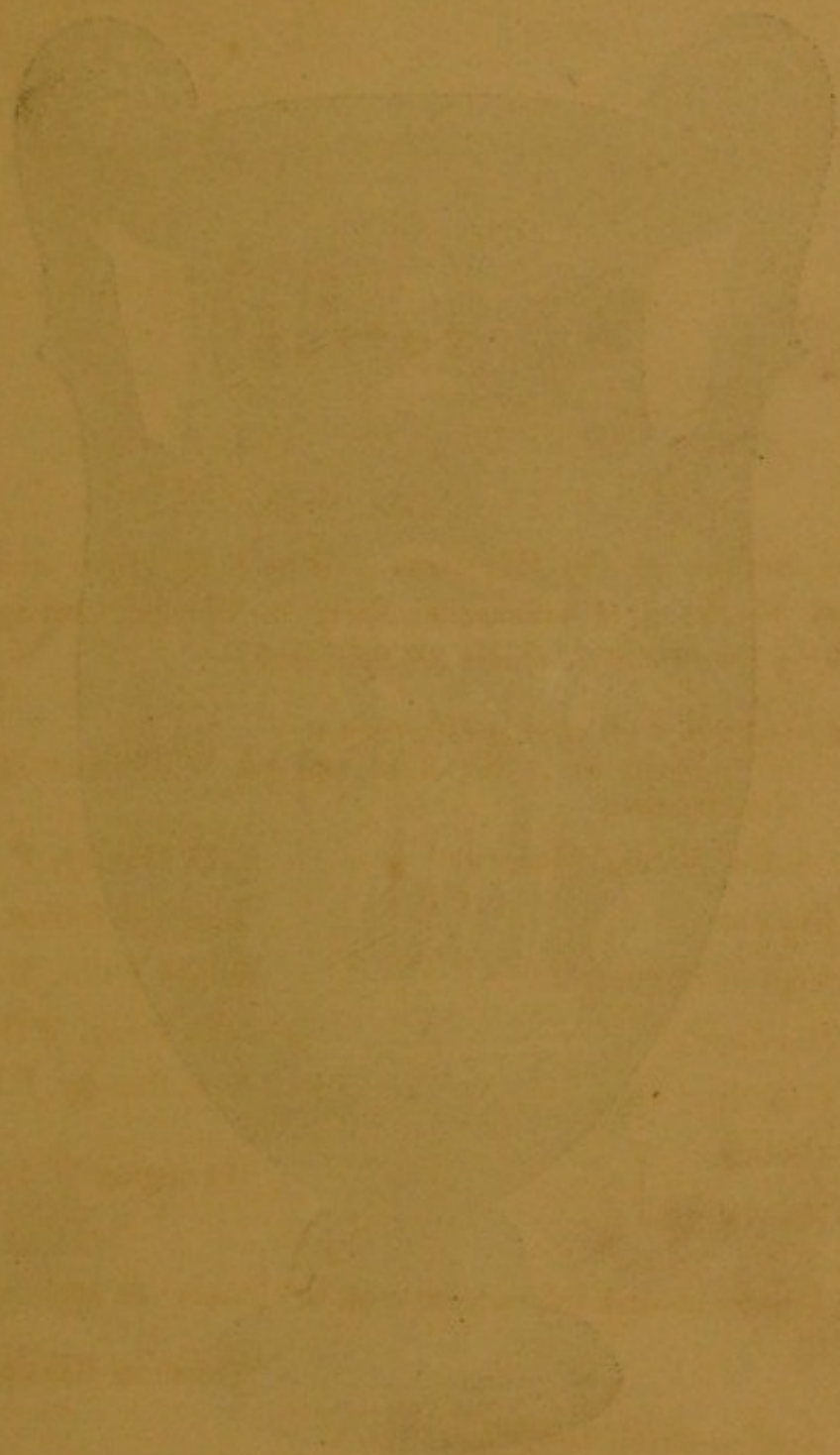
The Session of the Government School of Mines and of Science applied to the Arts commences early in October, during which the following Courses of Lectures are delivered :—

Chemistry, with special reference to its applications in the Arts and Manufactures	-	-	-	A. W. Hofmann, Ph. D. F.R.S.
General Natural History	-	-	-	T. H. Huxley, F.R.S.
Physics	-	-	-	George G. Stokes, M.A. F.R.S.
Applied Mechanics	-	-	-	Robert Willis, M.A. F.R.S.
Metallurgy	-	-	-	John Percy, M.D. F.R.S.
Geology	-	-	-	A. C. Ramsay, F.R.S.
Mining	}	-	-	Warrington W. Smyth, M.A.
Mineralogy				

A Prospectus and Information may be obtained on application to,

TRENHAM REEKS, Registrar.

Jermyn-street, London.







A copy of a large Greek vase in the British Museum collection (No. 1,567), executed by Wedgwood. The original was formerly in Sir W. Hamilton's collection. It belongs to the latest period of vase painting known as the style of the Basilicata, and is supposed not to be earlier than 200 B.C. See page 135. No. Ce. B. 193 a.

*Presented by Apsley Pellatt, M.P.*

MUSEUM OF PRACTICAL GEOLOGY.

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CERAMICS : Britain

FA1

BRITAIN : Ceramics



ZHH.41 (2)

## P R E F A C E.

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WHEN the sanction of the Treasury was given, in 1835, to the suggestion that advantage should be taken of the progress of the Geological Survey to form collections illustrative of the mineral wealth of the country, and of the application of its various mineral substances to the useful purposes of life, the Geological Survey was engaged upon Cornwall. Among the important substances there obtained were certain granite rocks known as *Cornish* or *China stone*, and an artificial product named *Cornish* or *China clay*, substances then largely employed in the composition and manufacture of porcelain and of certain earthenwares, and still more extensively used for these manufactures in the present day. The specimens obtained of these mineral substances for the museum, then in Craig's Court, immediately led to collections of others illustrative of the earthenware and porcelain more or less manufactured with them.

As the progress of the Geological Survey continued, various other British mineral substances, which either had been in former times or were now employed for ceramic purposes, became known; and it was considered desirable to form a Collection which should illustrate the composition and manufacture of British pottery and porcelain, from the occupation of Britain by the



Romans to the present time. Although some portions of the Collection in the Museum of Practical Geology may be defective, for the present, it may be regarded as the best that has hitherto been formed ; and there is every hope, especially from the continued donations of objects to it, which purchase could not obtain, that it may gradually be rendered still more effective for instruction.

In forming the Collection it became needful to show, to a certain extent, the progress of enamelled colours from early times. Indeed, it would have been difficult to understand that part of the subject without such specimens. Hence, those showing the enamel colours found at Nineveh and Babylon, the examination of which enabled Dr. Percy, Metallurgist to the Museum, to point out that certain metallic oxides and their combinations were systematically used in enamel colours many centuries before the periods usually assigned. In like manner certain Greek vases became valuable, as also specimens from Italy, commonly known as Majolica, and from other countries, in obtaining knowledge applicable to a proper consideration of the advance made in the composition and manufacture of British pottery and porcelain. Such additions, however, are limited, and have their general bearing pointed out in the Catalogue.

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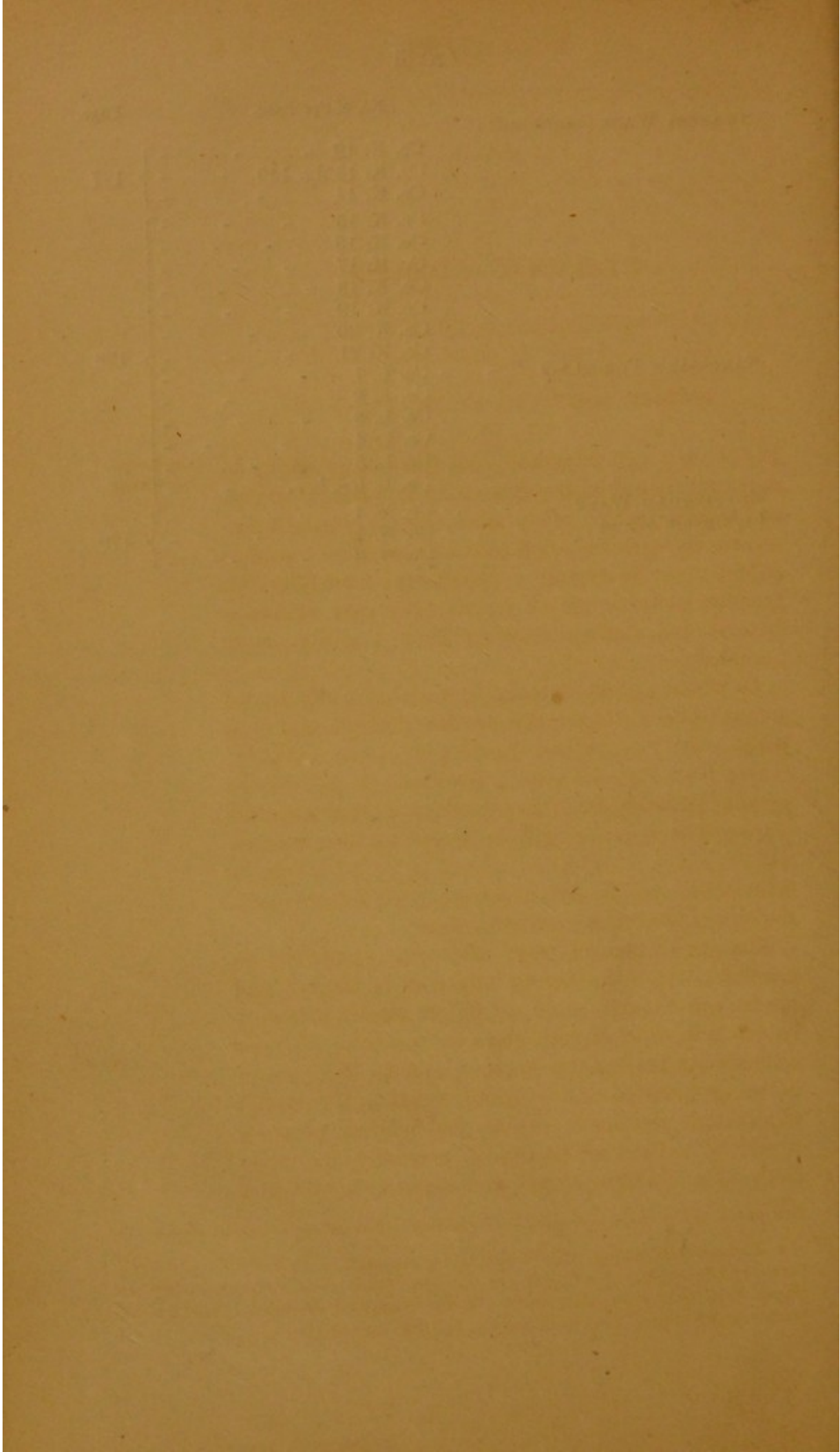
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## CERAMIC SERIES.

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### POTTERY, PORCELAIN, BRICKS, AND TILES.

It has been well remarked, that there is no branch of industry, viewed with reference to its history, theory, and practice, which offers more that is interesting as regards its economic applications or scientific considerations, than the ceramic or plastic art; none affording products more simple or varied, more easy of manufacture, and, notwithstanding their fragility, more durable.\*

Introductory  
Observations.

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It would appear in vain to search for any centre among nations whence this art was derived, and from which, like many other branches of human industry, it may have radiated among mankind; though certain peculiar methods of working the clays or other materials employed in it can readily be traced to their sources, and divisions of mankind, spreading by conquests or colonization, can be seen to have carried certain peculiarities of the ceramic art with them.

The desiccation of clays after rain, especially in countries where the drying influences of the sun and air are considerable, could not fail to attract attention to the soft state of such clays at one time, to their comparative hardness at another, and to their power of being moulded into various forms. We should expect that sun-dried portions for building purposes would be early used in regions generally dry, especially where building stones were scarce or absent, and

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\* Alexandre Brongniart, "Traité des Arts Céramiques, ou des Potteries, considérées dans leur Histoire, leur Pratique et leur Théorie." Paris, 1844. Préface, t. i.—An important work, from which a large portion of the information contained in many others written on this subject, since its publication, has been derived.



where walls would chiefly require protection from the more vertical effects of rain. The further hardening of clays by fire could scarcely also be otherwise than soon observed, since sun-dried bricks or any form of moulded clay employed in connexion with it would readily show the induration which could be thus produced. The hardened state of the clays, often, perhaps, when their composition was favourable and the heat sufficient, carried to partial vitrification, would be expected to introduce their further use for domestic vessels, especially for such as might advantageously be employed over fires. In certain cases even the composition of a clay might be so favourable that enough of vitrification of the more fusible parts was effected to hold liquids. No doubt, in regions where the vegetation enabled nations to use fitting portions of it, such as gourds and the like, for many domestic vessels, the desire to obtain those of baked clay, except for use over fires, might be checked. The horns, also, and skins of animals might often be found fully to serve the wants of many people for the like purposes; nevertheless, the convenience of baked clays for fire vessels, and the desire for those of larger sizes than horns or gourds could afford, would eventually produce an extended demand for the potter's art.

Whatever may have been the origin of brick making and pottery, and however the art may have spread, it was known and practised in early times, as is not only shown by ceramic remains among the ruined cities and tombs of ancient nations, but also by records, such as those of the Scriptures, wherein not only are references often made to the potter's art, but where that art is pointed out as held in high esteem.\*

*Base of clays.* The base of all clays may be regarded as that portion of the minerals named *felspars*, which remains after their decomposition by atmospheric or other influences. This portion is the combination of silica  
 Ce. R. M. 1. (or the matter of rock crystal, Ce. R. M. 1) with alumina (or the matter of sapphire, ruby, and corundum,  
 Ce. R. M. 2. Ce. R. M. 2), termed silicate of alumina, with the

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\* In the genealogy of the tribe of Judah a family of potters is mentioned as working for the king.—1 Chron. iv. 23.



silica left after the potash, soda, or lime of the other portions of the felspars may be removed in solution. Although all the four chief varieties of the felspars, known as orthoclase, albite, oligoclase, and labradorite\*, are liable to decomposition, the three former seem those which principally afford the base of the ordinary clays, and of these again the orthoclase (Ce. R. M. 3) may perhaps be regarded as that which more abundantly does so. These felspars constitute a portion, often considerable, of large masses of the rocks of igneous origin, such as granites, porphyries, greenstones, and the like,† as also of rocks derived from them, distributed in various directions, as beds and layers, by the agency of water. The more pure varieties of the finely comminuted matter forming clays are those which have been derived from rocks wherein decomposed felspars are combined with other minerals which have remained undecomposed. Thus, for example, certain granites, (wherein the felspar alone is decomposed, and this portion of them is reduced to a fine state of division, so as to be readily removed in mechanical suspension, by water passing over them,) afford a fine sediment from the remains of the felspars alone, the other minerals having a tendency, from their larger volume, to remain behind. In this manner large masses of the decomposed remains of felspars may be carried into cavities, or depressions, and be often covered with the other minerals of the original rock, formed into a kind of fine gravel, subsequently drifted over such masses. In this state the clay is usually white, and known as *kaolin*, from a similar name given *Kaolin*. to it by the Chinese.

Ce. R. M. 3.

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\* Although analyses show many minor modifications in the component parts of orthoclase, albite, oligoclase, and labradorite, the following may be regarded as their general composition :—

		Silica.	Alumina.	Potash.	Soda.	Lime.
Orthoclase	-	65·4	18·0	16·6 <sup>a</sup>	—	—
Albite	-	69·3	19·1	—	11·6 <sup>b</sup>	—
Oligoclase	-	63·0	24·9	—	12·1 <sup>c</sup>	—
Labradorite	-	53·7	29·7	—	4·5	12·1

<sup>a</sup> Usually including a little soda and lime. <sup>b</sup> Part of the soda often replaced by potash and lime. <sup>c</sup> Part of the soda also replaced by lime and potash.

† See the series of these rocks in the collections of the Museum.



When, however, the remains of the decomposed felspars are washed away into localities where they become intermingled with other earthy matters, in a finely comminuted state, or when they may be derived from a compound rock, such as some greenstones, formed of the mineral named *hornblende*, and of a felspar (commonly orthoclase), both minerals decomposing at the same time, so that their mingled remains are transported together in mechanical suspension, the resulting body is no longer white, but variously coloured. Thus, by the addition of different substances derived from different sources, clays of all kinds may be formed. Even when we suppose the purer varieties to have been deposited in the first instance, and to have formed distinct beds, as, for example, the kaolin clays of Bovey Heathfield, Devonshire (Ce. R. M. 4), which have been washed, with other detrital matter, and even trees,\* from the granitic region of a part of Dartmoor in previous geological times, it is easy to see that these clays may be again removed by atmospheric influences, rivers, and other geological abrading causes, and thus be rendered impure by the admixture of a variety of substances, brought into intimate mechanical union with them by these causes.

*Bovey clay.*  
Ce. R. M. 4.

*Poole clay.*  
Ce. R. M. 5.

Poole clay, so termed from being shipped at Poole, Dorsetshire, chiefly raised in the neighbourhood of Wareham, and extensively employed at the British

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\* "This (supracretaceous or tertiary) clay, which is stated to have been worked about the year 1730 (Lyson's *Magna Britannia*, Devonshire, p. ccxci.) is shipped at Teignmouth for the potteries, and would appear to have been formed naturally, much in the same manner as is now done artificially in Cornwall and Devon, though on a larger scale, decomposed granite having been washed down from Dartmoor into a lake or estuary; so that while the grosser particles were first lodged at the higher end nearest the granite, the fine sediment was accumulated at the lower part. Large quantities of this clay have been, and still continue to be raised from the neighbourhood of Teigngrace and White-way, and other places on that side of Bovey Heathfield. The mode of raising it is extremely simple, generally consisting in removing the gravel head and sinking a large rectangular pit, the sides of which are supported by wood. As the pit is sunk the workmen who cut out the clay in cubical or prismatic lumps, weighing about 30 lbs. to 35 lbs. each, fling the pieces by means of a pointed staff from stage to stage according to the depth of the pit; after which it is carried to the clay cellars, and thence forwarded, when it is properly dried."—Report on the Geology of Cornwall, Devon, and West Somerset, 8vo. 1839. According to the Rev. John Templer, about 20,000 tons of this clay were raised in 1822. It would appear to have varied at from 23,000 to 28,000 tons for ten years previous to 1838, and may be in 1852 about 25,000 tons.



potteries, is an example of a clay having a considerable amount of purity, that is, containing a large proportion of silicate of alumina and free silica, without injurious ingredients, accumulated far from any decomposing igneous rocks, such as granites, porphyries, and the like. It is known also as "blue clay" in the potteries.

Its geological position is in the portion of the tertiary or caenozoic beds (those occurring above the chalk) of Dorsetshire and Hampshire, which correspond with the Lower Bagshot Sands of the London district. Its decomposed felspathic matter, affording the silicate of alumina and a portion, at least, of the free silica, may readily have been derived from other beds, such as many sandstones, in which that matter may have been disseminated, the finer particles being held in mechanical suspension in water and transported to their present geological position. Previous clays also could be broken up and removed in a similar manner.\*

It is not known when "Poole clay" began to be first worked. By an Order in Council of 1666, arising out of a dispute between Wareham and Poole, it is directed that no dues were to be paid on "tobacco pipe clay."† In an Act of Parliament, obtained by Poole in 1756, the clay is still termed "tobacco pipe clay." In Hutchings' History of Dorsetshire, published in 1774, this clay is mentioned as the chief article sent from "the Key at Wareham," and in 1796 about 10,000 tons of it were exported annually.‡

\* Many of the British clays, termed *pipe clays*, from being used in the manufacture of tobacco pipes, would appear to have been derived from the disintegration of stratified rocks, those deposited by means of water, the decomposed felspathic matter, furnishing the silicate of alumina, remaining in a somewhat pure state, intermingled with much silica and a few other substances.

† For this and the following information respecting "Poole clay," we are indebted to Mr. William Joseph Pike, the chief exporter of that clay.

‡ Hutchings' History of Dorset, edition of 1796. The following is an extract from this edition:—"Good tobacco pipe clay is dug round this town (Wareham) at Arne Hill, Heneger Hill, Norden, &c. It formerly sold at 50s. a ton, but now at 14s. or 15s. Nearly 10,000 tons are annually exported to London, Hull, Liverpool, Glasgow, &c., but the most considerable part to Liverpool for the supply of the Staffordshire potteries, and to Selby for the use of the Leeds potteries. The principal pits are on Norden and Witch farms, the former belonging to William Moreton Pitt, and the latter to John Calcraft, Esq., and the clay taken from the same is in great repute with the Staffordshire and Yorkshire potteries from its peculiar excellence, and being the principal ingredient in the ware, commonly called Staffordshire ware, so universally in use in this kingdom, as well as in many other parts of Europe."



In 1831 the export of the clay had extended to 34,290 tons, and in 1851 it reached 69,286 tons, according to the clearances at the Poole Custom House. Of this 69,286 tons, about 53,268 tons were employed in the manufacture of the finer kinds of earthenware, chiefly in the Staffordshire potteries, and 16,018 tons for ordinary stoneware, tobacco pipes, alum making, &c.\*

*Substances  
essential to the  
body or paste.*

It has been shown by experience, and accounted for by science, that in proportion as the silicate of alumina and free silica prevail the clay is refractory, that is, infusible by the ordinary means of producing heat, and that, when iron and lime are present, the clays are more fusible. Indeed, as will be seen by reference to the catalogue illustrative of the metallurgical series, certain compounds of the silicates of alumina and lime form the slags or glasses so important in many metallurgical operations. The substances considered essential to the *body* or *paste*† of pottery or porcelain of all kinds are silicate of alumina, or silicate of magnesia, or both, combined with free silica. The silica in these bodies or pastes varies from 55 to 75 per cent., and the alumina from 35 to 25 per cent. Magnesia is a comparatively rare substance introduced into porcelain or pottery pastes, and is, when used, chiefly derived from the mineral named *steatite*. It is then employed to replace the alumina, either wholly or in part. It may often, however, be found disseminated in small quantities among clays, particularly where these beds are mingled with lime, derived from limestone dis-

\* The following will illustrate the export of "Poole clay" during the 21 years, ending with 1851, as obtained by Mr. Pike from the Poole Custom House :—

				Tons.					Tons.
1831	-	-	-	34,290	1842	-	-	-	35,887
1832	-	-	-	32,718	1843	-	-	-	23,300
1833	-	-	-	28,282	1844	-	-	-	31,275
1834	-	-	-	40,500	1845	-	-	-	41,512
1835	-	-	-	46,125	1846	-	-	-	40,975
1836	-	-	-	49,500	1847	-	-	-	43,535
1837	-	-	-	38,812	1848	-	-	-	32,277
1838	-	-	-	31,612	1849	-	-	-	37,237
1839	-	-	-	39,375	1850	-	-	-	54,877
1840	-	-	-	42,750	1851	-	-	-	69,286
1841	-	-	-	40,050					

The clay, either natural or artificial, used, is commonly termed the *body* in this country; by the French authors and manufacturers it is known as the *pâte* or *paste*.



tricts in which magnesian limestones may be intermixed with the more ordinary kinds.

While common natural clays afforded ready materials for ordinary pottery, and all within reach were employed in different districts, it could scarcely happen but that observation would lead to the use of some in preference to others, particularly if the heat employed, and the methods of work adopted were somewhat the same. The artificial preparation of clays for pottery, otherwise than by well washing and mixing, after selecting good localities for furnishing them, does not appear to have been employed in Europe until long after it was familiar to the Chinese, and indeed seems to have been adopted in European countries only in the early part of the eighteenth century, in order to produce a paste or body in imitation of the Chinese porcelain.

Judging from the analyses which have been made of the ancient pottery of Asia Minor, Egypt, Greece, Italy, and other somewhat advanced nations of the time, the pastes or bodies employed appear to have been little else than natural clays, selected for their fitness to the purposes for which they were intended. It has, indeed, been inferred that for the red ware peroxide of iron was introduced into the paste, and certainly in some of the pastes or bodies this oxide of iron is found somewhat largely, at the same time it should be recollected that several clays do naturally contain a large proportion of that substance. In the paste of the celebrated Greek pottery of the Campania there is often much oxide of iron, while the remainder of the paste has a very natural character. The mean of eight analyses of this pottery (differing little from each other), by M. Salvétat, at Sèvres, was as follows:—

Silica	-	-	55·88
Alumina	-	-	18·88
Oxide of iron	-	-	15·80
Lime	-	-	7·48
Magnesia	-	-	1·63

Viewing natural clays alone, we may regard the bricks and pottery made from them as varying from those which are simply dried in the sun to those some-

*Artificial clays  
for pottery*

*Pastes or bodies  
of ancient  
pottery*

*Body of Cam-  
panian Greek  
pottery.*

*Physical cha-  
racter of  
ceramic bodies.*



what highly fired or baked in kilns at a considerably elevated temperature. In the first case the brick or piece of pottery is merely a dry piece of clay, the particles adhering slightly together;\* in the second a partial chemical change has been produced, which, however slight in some cases, is yet sufficient to cause the unchanged particles to adhere firmly by means of such a cement, so that when the piece which they collectively form is struck, a bell-like sound, showing a fair amount of cohesion, is produced.

*Relative porosity of pottery.*

It will be obvious that sun-dried bricks or pottery, being merely pieces of desiccated clays, may be again reduced to the state of soft clay by the addition of the water lost by drying. This, however, is not the case with baked bricks or pottery, inasmuch as the condition of the matter is changed by the firing, all the parts melted or otherwise altered by the heat, being no longer in their original state, and thus with well-baked bricks or pottery a mixture with water produces no substance resembling the clay whence the bricks or pottery were formed. As to the porosity of pottery it may depend on the amount of firing; an incomplete baking, keeping a portion of the clay in its more natural state; or on the composition of the clay, combined with the amount of heat employed. These conditions may be such that vessels might be rendered to a great extent impervious to water without the aid of a coating of glass, or glazing for the purpose. Thus it would happen that while some clays, by their composition, gave a vessel or brick impervious to liquids, others under equal baking would be porous although manufactured in exactly the same manner.

*Shrinkage of clays from drying or firing.*

Clays have also to be considered as to their shrinkage from drying and firing, since in this respect they vary materially. The "fat" clays, as they are termed, those which are very unctuous and plastic, from containing little gritty matter and much water, usually shrink very considerably, while those which are "dry" or "lean," more harsh to the touch, from usually con-

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\* The Egyptians of the present day continue to make sun-dried bricks much in the same manner as appears to have been the practice in the same land in ancient times, mixing straw or reed with their clay to assist in keeping the desiccated mass well together. The Israelites complained that they were compelled to make bricks without straw.



taining disseminated grains of sand and less water in the same bulk, better keep to the size and shape first artificially given them. Thus a brick composed of the first kind will commonly get out of shape and crack, while one made of the latter may retain its general form when becoming hard.

The shrinkage arises from two causes—First, those clays which contain the larger amount of hydrated earths (water combined with earths) shrink from the loss of water, even to 15 per cent. and beyond: this may not arise from their fusibility, since they are often very refractory in the furnace. Secondly, from being formed of fusible substances, the decrease of bulk arising from the increased juxtaposition of the component particles of the clays by fusion, and amounting frequently to from 10 to 15 per cent., a certain loss of volume being also due to the evaporation of the water of the clay. From these causes, either single or combined, it becomes very essential that in pottery all portions of the clay employed should be of the same kind or composition, otherwise the shrinkage would be unequal, and the vessels, in baking, would be distorted and cracked from that cause alone. In the employment of natural clays, therefore, it becomes needful well to knead and work them, a process, judging from the better kinds of pottery of ancient nations, well understood by them.

*Causes of shrinkage of clays.*

Although natural clays may frequently have been employed singly, it could scarcely happen but that occasional experience and often, probably, original design, arising from known variations in their plastic or other characters, induced the potters to mingle certain of them together, especially in districts where both "fat" and "dry" or "lean" kinds might be found near each other, so that the pottery produced answered the different purposes for which it was intended. In the operation of firing alone the potters must have often found such variations of fusibility in the clays employed as to lead them to mingle two or more together, so that a highly fusible body or paste was modified by one found from experience to be more refractory.

*Mixture of natural clays.*

Artificial clays, or those not occurring naturally as clays, would seem to have been first employed by the

*Artificial clays.*



*Early date of  
porcelain  
manufacture  
in China.*

Chinese for their pottery or porcelain. The date at which the use of these artificial clays commenced in China appears uncertain. Indeed, how far the clays may have been first used in their natural state as found in the vicinity of decomposed granitic rocks, the natural process by which they were formed being afterwards artificially imitated, seems also uncertain. It might easily happen that the kaolin distributed in beds or irregularly in hollows first attracted attention, this kaolin mingled with quartz in such proportions that if pounded the whole would constitute a clay well fitted for porcelain. Be this as it may, according to the researches of Mr. Stanislas Julien,\* porcelain, or some ware which is thus termed, was well known in China B.C. 163. In A.D. 600 porcelain was in common use, and in A.D. 1000 the art is considered to have attained its greatest perfection in China. Marco Polo, the Venetian traveller, saw the manufacture of porcelain at Kinsai, as it was carried on in the thirteenth century, and mentions the mining of at least a part of the materials employed, and its being left exposed to atmospheric influences for many years, during which time it was never disturbed.

*Composition  
of Chinese  
porcelain.*

*Kaolin.  
Pe-tun-tse.*

It is probable that the main general composition of the present artificial clays employed by the Chinese for their porcelain has long remained the same, so that we may thus obtain a fair insight into those used by them in former times by an examination of those now employed. The chief ingredients of these clays are *kaolin*† and *pe-tun-tse*. There seems little doubt that kaolin is the decomposed felspar above mentioned (p. 3), while with the pe-tun-tse there is somewhat more difficulty, as it may be a rock somewhat like the *China stone* of Cornwall, a compound of felspar, (in a somewhat decomposed state usually) quartz, and a steatitic mineral; a granitic rock similar to that often termed *pegmatite*, composed of felspar and quartz, or the rock sometimes known as *compact felspar*, which is little else than *pegmatite* in a state where the component minerals, quartz and felspar, have not crystal-

\* Brongniart, *Traité des Arts Céramiques*.

† The term kaolin is said to be derived from Kaou-ling (lofty-ridge), the name of a hill whence some of it is obtained.



lized out separately. Pe-tun-tse may indeed be a name given to a somewhat variable substance. It is evidently somewhat hard when first obtained, requiring to be broken into fragments and reduced to a fine state of comminution by pounding.\* It is mixed with water, from mechanical suspension in which it gradually subsides in tanks, and the water being withdrawn the pe-tun-tse† remains fit for use. The granitic district in the neighbourhood of the Poyang lake affords both kaolin and pe-tun-tse, in the same manner that the granitic district near St. Austell, Cornwall, furnishes both *China clay* (kaolin) and *China stone* (used by our manufactures as pe-tun-tse is by the Chinese). Steatite or soapstone, *hua-she* (slippery stone), is also used by the Chinese in their porcelain, but the articles manufactured are stated to be rare, and more than usually costly.

The following analyses, by M. M. Laurent and Malaguti, show the chemical composition of certain of the Chinese porcelains, the composition of Chinese, like that of other porcelains, necessarily varying according to the intentions of the manufacturers, as to the market for their wares ‡:—

	Silica.	Alumina.	Potash.	Lime.	Protoxide of Iron.	Magnesia.	Total.
Paste or body of a white vase ornamented with painting.	70·5	20·7	6·0	0·5	0·8	·01	98·6
Paste or body of a greenish white plate, with blue ornaments.	53·5	28·5	5·0	0·6	0·8	trace.	98·4

Although vases and other pieces of Chinese porcelain found their way to Europe before the Portuguese had

*Introduction of Chinese porcelain into Europe.*

\* The mode of pounding, &c., is shown in Brongniart's *Traité des Arts Céramiques*, p. xlii., taken from Chinese drawings.

† The best pe-tun-tse is stated to come from Hoey-chow adjoining the province of Keang-nan. Sir George Staunton mentions pe-tun-tse as obtained from the neighbourhood of King-te-chin.—Davis's *China and its Inhabitants*, 1840, vol. ii. p. 244.

‡ Porcelain is stated to be made in several places in China. There is a large manufactory at King-te-chin and another at Chaou-king-foo, west of Canton (Davis's *China*). Very celebrated porcelain is made at the former place, where there were nearly 3,000 kilns, (of small size we may suppose,) at the beginning of the last century, according to the Père d'Entrecolles, who resided there in 1712.



doubled the Cape of Good Hope in 1497, it was only after that event that this porcelain became well known to various European nations.\* The Portuguese would appear to have carried on a considerable trade in Chinese porcelain, as also the Dutch who succeeded them in a great part of their East Indian traffic. According to Mr. Marryat,† the earliest mention of China ware in England is in 1586. The English East India Company, formed in 1600, having at length obtained an establishment at the port of Gombroon, opposite Ormus, in the Persian Gulf, introduced Chinese porcelain directly from thence into England, and hence it became known as Gombroon ware. In 1631 China ware was commonly imported into England.

*First European  
porcelain made  
at Meissen,  
Saxony.*

The introduction of Chinese porcelain produced a strong desire to imitate it. Although the ornamental designs were copied upon ordinary European wares, such as those of Delft, no real advance was made until the discoveries of Böttcher in the commencement of the eighteenth century. It would appear that Böttcher was an apothecary's assistant of Berlin who fled into Saxony to avoid persecution on account of his supposed secret of making gold. It is related that working in the laboratory of Tschirnhaus, an alchemist, at Dresden, some crucibles prepared by him assumed the character of Chinese porcelain. He at first worked at Dresden with a brown clay found near Meissen, and produced a red ware; and it was not until 1709 that he made white porcelain. Though not good, it was sufficient to induce Augustus II. Elector of Saxony and King of Poland, who had previously seen the importance of the subject, (even confining Böttcher, though with every comfort, in the Albrechtsburg at Meissen, to

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\* The Portuguese introduced China porcelain into Europe about 1520.

† "Collections towards a History of Porcelain and Pottery in the 15th, 16th, 17th, and 18th centuries." London, 1850, p. 103.—"In the inventory of minor valuables belonging to Mary Queen of Scots, are enumerated:—'Deux cuillières de pourcelaines, garnyes, l'une d'or, et l'autre d'argent.'" He adds, "Cavendish, however, the celebrated traveller in the reign of Queen Elizabeth, is supposed to have presented his royal mistress with the first vessels of porcelain ware which came into England. Mr. Douce, in his illustrations of Shakspeare, says, that in the reign of Elizabeth Spanish carracks were captured and part of the cargo was china ware of porcelain. Amongst the new year's gifts to Queen Elizabeth, 1587–8, Lord Treasurer Burghley offered one 'porrynger' of 'white porselyn' garnished with gold; and Mr. Robert Cecil 'a cup of grene pursselyne.'"



prevent his escape and that of the secret,) to establish a manufactory at Meissen. Böttcher was appointed the director in 1710, and in 1715 succeeded in making fine and excellent porcelain. This manufactory has continued to the present day, producing the fine porcelain more commonly known in this country as Dresden china.

Whatever were the clays with which Böttcher originally worked, it would appear that he finally employed the kaolin of Aue, from near Schneeberg, in the Erzgebirge. To its use, it is stated, he was led by finding that the hair powder furnished to him was heavier than the ordinary kind; and by experiment ascertaining that this powder, substituted for the wheaten flour, with which the true hair powder should have been composed, was the substance he sought for in the manufacture of his porcelain, being, in fact, dried and powdered kaolin.\*

*Discovery of European kaolin.*

The greatest secrecy was adopted with respect to Böttcher's method of manufacturing porcelain. The kaolin itself was sent in sealed barrels, by sworn persons, and its exportation was prohibited. The workmen were closely watched, and the establishment at the Albrechtsburg at Meissen was a complete fortress for the confinement of the parties employed. The warning of "Be secret until death" was placed in the workshops. This secrecy continued even down to 1812, when M. Brongniart, inspecting the Meissen works, upon the requisition of Napoleon, it was found necessary to release M. Steinau, the director of the manufacture, from his oath, in order to explain the process adopted.

*Secrecy adopted respecting the porcelain manufacture at Meissen.*

Notwithstanding all the precautions taken, in 1718, the year previous to the death of Böttcher, which took place in 1719, Stölzel, the chief workman at Meissen, escaped and endeavoured to establish works at Vienna, with the aid and under the direction of a Belgian named Claude du Pasquier, or du Paquier. The latter

*Vienna porcelain.*

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\* The statement is, that John Schnorr, an iron-master, riding near Aue, observed that a soft white earth adhered strongly to his horse's feet. Considering that this earth might be used as a substitute for wheat flour as hair powder, he carried some away with him, and it was subsequently sold in large quantities for this purpose at Dresden, Leipsic, and other places. This Kaolin continued long to be known as *Schnorr'sche weisse Erde* (Schnorr's white earth).



*Höchst porcelain.*

obtained a licence for 25 years from the Emperor Charles VI., but was not able to raise the funds necessary for carrying on the works in a proper manner. These did not advance until the manufactory was acquired for the State by the Empress Maria Theresa in 1744. A workman from the Vienna manufactory named Ringler made, in 1740, good porcelain at the pottery at Höchst, a village on the Nidda, in the Mayence territory, one previously celebrated.

*Berlin Porcelain.*

The method of manufacturing the Meissen porcelain gradually spread. In 1750 porcelain began to be manufactured at Berlin by a merchant named Wezelly, who obtained the secret from the Höchst workmen. Gotzkowski a banker succeeded, in 1761, and advanced the works. Frederic II. bought them in 1763, and made them into a royal manufactory. In 1758 a manufactory, established at Neudeck in 1747, was transferred to Nymphenburg, near Munich. In 1765 the St. Petersburg manufactory, formed by the Baron Yvan Antinovitch in 1744, was enlarged by the Minister Olsonieff.

*Munich and St. Petersburg porcelain.*

*Sèvres Manufactory.*

The Sèvres works were first established at St. Cloud, where, from 1695, a ware with a coarse yellow paste was manufactured. From the account given by Martin Lister, who visited the St. Cloud works in 1698, it would appear that "there was no moulding or model of China ware which they had not imitated; and they had added many fancies of their own, which had their good effects, and appeared very beautiful."\* Reaumur who had obtained kaolin and pe-tun-tse from China, endeavoured (1727 to 1729) to discover similar substances in France. Although he did not himself succeed in his researches, he was the means of paving the way for the use of these substances, when discovered, in the Sèvres manufactory. In 1745 a company was formed with privileges for 30 years; and the manufactory was established in the Château de Vincennes. These privileges were sold in 1753, and a third share

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\* It was a common practice in the early attempts at making porcelain, after its more general importation into Europe by sea round the Cape of Good Hope from China, to imitate both the forms of the vases, dishes, &c., imported, and the designs painted upon them.



having been taken by Louis XV., it obtained the title of a royal manufactory. In 1756 the works were removed to Sèvres, more space being required in consequence of their progress; and in 1760 Louis XV. became the sole proprietor. Though the "soft porcelain"\* had been made, as in England, for several years, the "hard porcelain," such as had been for a long time manufactured at Meissen, was not made at Sèvres until after the discovery of kaolin in France. This was first effected near Alençon by Guettard, who gave an account of it to the Académie des Sciences in 1765. The kaolin, however, was found not sufficiently good for the purposes required. Kaolin having been accidentally discovered the same year at St. Yrieix, near Limoges; and having been ascertained to be both abundant and of good quality in 1768, the manufacture of hard porcelain was established at Sèvres in 1769.

*Discovery of  
kaolin in  
France.*

The exact date of the first English porcelain manufactures at Bow and Chelsea does not appear to be very correctly known.† The source also of all the clay employed (though some, at least, is stated to have been imported directly from China), is not clearly ascertained.‡ The sand used to render the clays perfectly "dry," is mentioned as having been obtained from Alum Bay, in the Isle of Wight, a sand which has been extensively employed in the manufacture of glass.§ It is certain also that pounded glass was at first mixed

*Bow and  
Chelsea porce-  
lain.*

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\* The terms of "soft" and "hard" porcelain are often employed to distinguish the different kinds, but it may be doubted how far this is advisable, seeing that the different kinds pass so much from one into the other. "Hard" porcelain is more refractory than the "soft," and is usually also less easily to be scratched. Not only as respects the body or paste, but the glazes employed, the same distinctions prevail, the harder bodies being commonly covered with the harder glazes.

† Mr. Marryat, in his *History of Pottery and Porcelain* (p. 172), points out that Martin Lister, in 1698, alludes to a manufacture of porcelain (if such it could be termed, being little better than a kind of opaque glass) at Chelsea. It seems to have been an attempt to make ware in imitation of the Chinese, all the early specimens being painted closely to resemble that ware in order to be sold for it.

‡ M. Georley, who visited London in 1765, was informed "that the county of Cornwall supplied them (the Chelsea works) with the sort of earth fit to make porcelain." —(*Tour to London*, London, 1772, vol. ii. p. 76.) About this time (1768), as will be seen in the text, Cookworthy is considered to have discovered the Cornish kaolin.

§ This sand forms part of the tertiary, or cainozoic series of rocks occurring on the northern side of the Isle of Wight. It is worked and carried away in large quantities at the present time from Headon Hill, Alum Bay, for glass manufactories.



*Natural kaolin  
of Bovey,  
Devon.*

with the clay and sand at the Chelsea works, in order to imitate the transparency of the Chinese porcelain. There is also some uncertainty as to the kinds of clay employed in the earlier works at Derby and Worcester.\* The natural kaolin of Bovey Tracey, Devon, is stated to have been worked in 1730, and the clay of Wareham, Dorset, and other adjacent places, was exported, as above mentioned, at least as early as 1666.

*Discovery of  
Cornish kaolin.*

The great advance of the porcelain manufacture in England is due to the discovery of the kaolin of Cornwall by William Cookworthy, of Plymouth, about 1755. Borlase, in his "Natural History of Cornwall," 1758, makes no mention of any Cornish clays employed in pottery; he merely notices that of Amalebria, in Towednack, as likely, from some experiments he had made, to be useful for porcelain, stating that there were other white clays at Tregonning Hill, near Breague, &c. He also notices other clays as fitted for the purpose, and mentions that W. Cookworthy had made experiments on the Breague China stone; and that it had been found useful in the manufacture of porcelain. Cookworthy apparently had his attention directed to the subject by an American, who showed him China stone and kaolin from Virginia, in 1745.† He afterwards found these substances in Cornwall, and, eventually, with Lord Camelford, worked both, on property of the latter, in the parish of St. Stephen's. Pryce, in his "Mineralogia Cornubiensis," published in 1778, states that artificial kaolin (China clay) was then made in the parishes of Breague and St. Stephen's, by repeated washings with clear water, and afterwards packed in casks and sent off,‡ and that Mr. Cookworthy, by his late improvements

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\* Respecting the *soft paste*, as it has been termed, of Chelsea, Bow, and Derby, and of the early manufactures of St. Cloud, Chantilly, and Sèvres, M. Arnoux mentions (Lectures on the Results of the Great Exhibition of 1851—Lecture on Ceramic Manufactures) that it should be carefully distinguished from the soft paste now made. He states, that in the preparation of the former, "they fritted a pure siliceous sand with salts of potash, soda, lime, and alumina; this frit was very white, and as it did not contain any hydrate of alumina to make it plastic, they were obliged to add a certain quantity of a white calcareous clay; however, as this clay altered the whiteness and transparency it was used very sparingly, and they were compelled to give an artificial plasticity by using soft soap and gum."

† Prideaux's Relics of Cookworthy, 1853.      ‡ Mineralogia Cornubiensis, p. 32.



at his porcelain manufactory, then established at Bristol (having been removed there from Plymouth), was likely to produce ware which should rival the best Asiatic china. Lord Camelford seems evidently to have been a partner of Cookworthy in the patent of 1768, usually, but erroneously considered as the date of the discovery of the Cornish kaolin. This patent was eventually sold by them to Mr. Champion, of Bristol.\*

Kaolin is now chiefly prepared in Cornwall and Devon, from the Hensborough, or St. Austell granite, and from the north side of Tregonning Hill, near Breague, in the former, and from the south side of Dartmoor, near Shaugh, in the latter county. In these and certain other localities the decomposition of the felspathic portion of the granitic rocks in that district is found very favourable for its preparation. Though the method of making kaolin is simple, at the same time it requires much care so that the kinds obtained from the substances acted upon should be as pure as those substances will permit. The presence of iron has particularly to be avoided, as it would colour the body or paste of earthenware or porcelain made with a kaolin containing it.†

Those places are selected where water can be readily procured, and where the rock is in a very friable state from the decomposition of its felspar. The less of other minerals the rock may contain, and the harder, the heavier, and less decomposed these may be, the better. The decomposed rock, usually containing much quartz, is commonly exposed on an inclined plane to a fall of a few feet of water, which washes it down to a trench, whence it is conducted to catch-pits. The quartz, and the schorl, mica, or other minerals which may be present, are in a great measure retained in the first catch-pit; but there is usually a second or even third pit in which the grosser portions are collected, before the water, charged with the finer particles

\* Letter of Lord Camelford to Mr. Polwhele, (Hist. of Cornwall,) Nov. 30, 1790. The writer refers both to kaolin and China stone, "which he (Cookworthy) immediately perceived to be the two materials described by the Missionary Père D'Entrecolles."

† Occasionally a decomposed felspar may contain sufficient iron to render it profitable as a paint. Thus from a decomposed elvan (granitic porphyry) on the west of Killiow, near Truro, Cornwall, a very excellent yellow ochre is obtained by the same method of washing as is employed for making kaolin, and large quantities are sent away, the amount of iron in the felspathic portion of the rock being sufficient to produce a good colour.



of the decomposed felspar, in mechanical suspension, is allowed to come to rest in the tanks or ponds prepared for the purpose. In these the matter of the kaolin is permitted to settle, the water being withdrawn by means of holes in the sides of the tanks from which plugs are removed as it gradually parts with the matter in mechanical suspension. By repeating this process the tanks become nearly full of kaolin in a state of soft clay. This by exposure to the air is allowed to dry sufficiently to be cut into cubical pieces of about 9 or 12 inches in the sides, which are then carried to a roofed building, through which the air can pass freely, and are so arranged that they become properly dried for sale. When considered sufficiently dry, the outsides of the lumps are carefully scraped, and the pieces of kaolin are sent to the potteries in bulk or casks as may be thought desirable.

The kaolin of Cornwall and Devon varies much in quality, both on account of the substances worked and the care employed in making it. The quantity prepared and shipped has been estimated as at present more than 80,000 tons per annum.\*

The following are illustrations of the kaolins:—

- Ce. R. M. 6. Decomposed granitic rock from which the kaolin is obtained at the Morley or Lee Moor clay works, near Shaugh, Devon. *Presented by Earl Morley.*
- Ce. R. M. 7. Kaolin from the Morley or Lee Moor clay works, Devon, quality, B.B. *Presented by Earl Morley.*
- Ce. R. M. 8. Kaolin from the Morley or Lee Moor clay works, Devon, quality P.† *Presented by Earl Morley.*
- Ce. R. M. 9. Decomposed granite from which the kaolin is prepared, Gunbarrow, St. Austell, Cornwall. *Presented by Mr. Arthur Phillips.*

\* Mr. H. M. Stocker, of St. Austell, in a paper "On the China stone and China clays of Cornwall," read before the Polytechnic Society of Cornwall, at their meeting of 1852. He estimates this quantity as shipped from Cornwall alone, and takes the sum of 240,500*l.* as spent in the preparation of kaolin in Cornwall. He represents 7,200 men, women, and children, as employed in the kaolin works in Cornwall, estimating the value of their labour at 197,100*l.* per annum.

† The following are analyses made of the Morley or Lee Moor china clays, by the late Mr. Richard Phillips, F.R.S., at this Museum in 1850:—

		P.		B.B.
Silica	-	45·30	-	50·65
Alumina	-	53·00	-	48·85
Magnesia	-	·71	-	·13
Oxide of Iron	-	—		trace.



Kaolin from Gunbarrow, St. Austell, Cornwall.	Ce. R. M. 10.
<i>Presented by Mr. Arthur Phillips.</i>	
Kaolin from Bluebarrow, St. Austell, Cornwall.*	Ce. R. M. 11.
<i>Presented by Mr. Arthur Phillips.</i>	
Kaolin from Carnbean, St. Austell, Cornwall.	Ce. R. M. 12.
<i>Presented by Mr. Arthur Phillips.</i>	
Kaolin from Stents, St. Austell, Cornwall.	Ce. R. M. 13.
<i>Presented by Mr. Arthur Phillips.</i>	
Kaolin from Huel Prosper, Roche, Cornwall.	Ce. R. M. 14.
<i>Presented by Mr. Arthur Phillips.</i>	
Kaolin from Park an Dillac, St. Dennis, Cornwall.	Ce. R. M. 15.
<i>Presented by Mr. Arthur Phillips.</i>	
Kaolin from St. Stephens, Cornwall.*	Ce. R. M. 16.
<i>Presented by Mr. Arthur Phillips.</i>	

The china-stone of Cornwall, exported to the pot-<sup>Cornish china-</sup>teries, may be considered as the granitic rock which<sup>stone.</sup> furnishes the kaolin in a minor state of decomposition, the felspar of the compound rock still retaining much of its silicate of potash or soda. It is usually a mixture of quartz, partly decomposed felspar (the amount of decomposition varying materially), and of scales of a greenish-yellow talcose substance, requiring merely to be broken into convenient pieces for carriage, those parts of a quarry being avoided in which schorl† becomes intermixed with the rock. The china-stone is chiefly quarried from the granite of St. Stephens, that furnishing some of the best kaolin. China-stone is also exported in smaller quantities from Porthleven and St. Michael's Mount, derived from Tregonning Hill, Breague, which also furnishes kaolin. The quantity of china-stone exported from Cornwall is estimated at 18,000 tons.

China-stone from St. Stephens, Cornwall, composed Ce. R. M. 17.

\* The following analyses of Bluebarrow (1) and St. Stephens (2) Kaolins were made by Dr. Lyon Playfair, at the laboratory of this Museum, in 1852:—

Clays, dried at the temperature of 212° Fahrenheit.

	(1)	(2)
Silica - - - - -	45.52	46.38
Alumina, with trace of oxide of iron - - -	40.76	38.60
Lime - - - - -	2.17	3.47
Potash, with trace of soda - - - - -	1.90	1.77
Magnesia, phosphoric acid, and sulphuric acid -	traces	traces
Water, with a small quantity of organic matter -	9.61	9.08

† A mineral somewhat common in the granite of which the china stone forms a portion.



of quartz, slightly decomposed felspar, and a talcose mineral.

*Presented by Mr. Arthur Phillips.*

Ce. R. M. 18. China-stone from the same district, the felspar in a more advanced state of decomposition.

Ce. R. M. 20. China-stone, Restourack, St. Dennis, Cornwall.

*Presented by Mr. Arthur Phillips.*

Ce. R. M. 21. China-stone, Tregonning Hill, Breague, Cornwall.

*Presented by Mr. Arthur Phillips.*

*Mixtures of natural and artificial clays in British pottery.*

*Flint (commi-nuted) employed in British pottery.*

Although natural clays are extensively employed for British pottery, such, for example, as the Devon or Bovey clays, and the Dorset or Poole clays (above mentioned, p. 4), they are usually mixed with a certain proportion of the Cornish and Devon artificial kaolins, the proportion varying according to the kind of earthenware or porcelain required. Grains of silica are always mingled with them, these commonly now obtained from flints, finely pounded, and mechanically mingled in the general paste or body. The flints\* are obtained from the chalk districts from which there is the cheapest carriage, and usually by sea and canals. Those which are black are usually preferred. They are first calcined or burnt in a kiln, to render them easily broken. They are then stamped or crushed, and afterwards mixed with water, and reduced to the consistence of cream by grinding in circular pans, the bottoms of which are commonly paved by some hard stone, not uncommonly chert, over which heavy stones of the like kind are driven round by machinery, the flints being thus ground in water between them. When taken out of these pans, the creamy looking mixture is placed in a reservoir, often termed an *ark*, where the pounded flint settles, and the water is drawn off.

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\* The introduction of flints into the manufacture of pottery is attributed to Mr. Astbury, a Staffordshire potter of great enterprise, who, in 1720, riding to London on business, as then was a common practice, found his horse's eyes disordered before he reached Dunstable. On arriving at the inn in that town he consulted the ostler, who placed a small flint in the fire, heated it to redness, and, after throwing it into water, pulverized it: he then blew a little of the powder into the horse's eyes. The attention of Mr. Astbury was arrested by the process of reducing the flint to powder. Observing the white character of the latter, he had some flints sent to Shelton, "where," according to Dr. Shaw ("Chemistry of Porcelain, Glass, and Pottery," 1837,) "on his return home he had them fired after the ware was baked; then pulverized in a large mortar; and in the state of powder mixed with pipe clay in water, with which he *washed* the inside of his hollow ware. Ultimately it was introduced into the body."—Page 248.



Flints as obtained from the chalk districts, these Ce. R. M. 22.  
from—

Flints calcined in a kiln.

Ce. R. M. 23.

Flints stamped and crushed.

Ce. R. M. 24.

Flints after they have been ground in the mills.

Ce. R. M. 25.

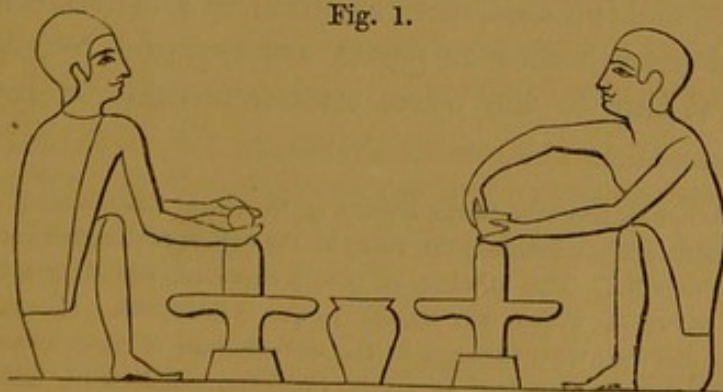
Ce. R. M. 22, 23, 24 and 25. *Presented by Mr.*

*Lewis Dillwyn.*

As the potter's wheel is, and has been so important a *Potter's wheel.* machine in the manufacture of pottery and porcelain, a slight notice of its progress among mankind may be desirable. After much discussion on the subject, it would appear probable that the potter's wheel, like so many other things connected with the ceramic art, is derived from China. M. Brongniart\* infers that the potter's wheel after leaving China, where it had been long known, passed into Egypt by Scythia and Bactria, and through Scythia or Egypt itself to the Arabs of the Arabian peninsula and of Africa. He also considers that the evidence shows it to have been introduced through Scythia, and nearly at the same time into Greece, and its colonies in Southern Italy, reaching Etruria at a later date, and that it then penetrated the whole of Southern Europe, Rome and its colonies, Spain, &c., as these countries became civilized and acquainted with the arts of the East, stopping at the southern part of Germany, and only partially entering it; and that, while penetrating into Gaul, it remained unknown among the ancient Scandinavian nations.

Representations of the potter's wheel in the tombs at Thebes show, as in the following figure (fig. 1), that the general method of employing that machine in ancient days in Egypt was much the same as that common in most countries at the present day.

Fig. 1.



\* Brongniart, *Traité des Arts Céramiques*.



*Manufacture of earthenware.*

With respect to the manufacture of common earthenware, one which is so considerable in England, not only for home consumption but for exportation, being sent to various parts of the world in great quantity, and which is, at the same time, so cheap,\* the following sketch of the processes usually employed may be useful to the visitor.

*a.* The *common body* or paste is usually composed of Dorset or Poole clay, Cornish or Devonian kaolin, and flint.

*b.* *Best-body* is formed of Dorset or Poole clay, Cornish or Devonian kaolin, Cornish china-stone, and flint.

The Dorset or Poole clay, which may be regarded as the base or chief ingredient in the manufacture of English earthenware, is mixed with water, and reduced to a state in which it can be passed through sieves of various sizes, in order to clear it of all lumps, and to render it of a fine general consistency. The kaolin requires no cleaning preparation, and the flints are used as they come, finely comminuted, from their deposit in water after passing the grinding mills. The china-stone requires to be treated as the flints, with the exception of being calcined or burnt in kilns, having to be crushed and reduced to a fine powder in mills.

The materials being all thus ready for use, the proportions of each considered requisite for the kind of ware to be made are taken and mixed with water and with each other, to the *slip kiln*, a long brick-trough heated by means of flues from a furnace. Here the mixture is kept simmering until it becomes something of the consistency of dough. It is then ready for use, and is placed, until required, in cold dark cellars. If coloured bodies or pastes are required to give a general tint to the ware, certain metallic oxides, or

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\* According to M. Arnoux (Lectures on the Results of the Great Exhibition of 1851, vol. ii.—Lectures on Ceramic Manufactures) the value of the export of English earthenware, in 1851, was 1,062,000*l.* The number of pieces exported, including those of British porcelain (the value of which was 60,000*l.*), was 84,000,000. M. Arnoux states that in 1852, 185 factories were engaged in the manufacture of earthenware and porcelain; 52 scattered over the country, at Leeds, Stockton, Sunderland, Glasgow, Swansea, &c., and 133 in North Staffordshire, where 60,000 persons were more or less occupied in this manufacture in the districts commonly known as the "Potteries."



coloured clays or marls, are added to the prepared mixed clay, as may be thought desirable. *Manufacture of earthenware.*

The body or paste of mixed materials being now prepared, it is either *thrown*, as it is termed, by means of the potter's wheel, that is, raised into circular forms of different kinds by means of the rotary motion of the wheel, and by the action of the fingers, or moulded into forms, in the latter case the paste or body being first rolled into flattened pieces, which can be easily squeezed into a mould, commonly of plaster of Paris. When thought desirable, the "thrown" forms are finished by placing them on a lathe, and turning them into more accurately circular shapes.

The various forms of the paste or body being completed, the pieces are taken to be carefully dried in rooms prepared for the purpose, in order to deprive them, as much as possible, of moisture, without causing disintegration; water in the pastes or bodies being to be regarded only as a tool in the manufacture, to be laid aside when no longer required.

The future pieces of earthenware being thus sufficiently dried, are placed in large flat-bottomed pans, oval or round, as may be considered desirable, with vertical sides of sufficient height, termed *saggers*, made of refractory materials, such as fire-clays, the broken pieces of earthenware after the first firing, and also of broken saggers themselves, pounded up, and often mixed with a small portion of damaged Dorset, Devon, or Cornish clays. In these saggers the pieces of dried future ware are so placed as to allow as many as possible to be packed without injury to each other. The saggers are then arranged in a kiln, termed the *biscuit kiln*, one above the other, so that an upper covers a lower sagger. The kiln is then "fired," that is, the heat deemed proper is communicated to it, and the "fire" is continued for about three days; that is, a kiln "fired" on Monday evening will be ready to be "*drawn*," or the saggers and their contents removed, on Friday morning. The ware is then in the condition termed *biscuit*, white and porous, readily absorbing water.

The *biscuit* is now in a state to be painted with certain colours, which can be used "*under the glaze*,"



*Manufacture of earthenware.* that is, before it is covered with a preparation which, in another "firing," turns into a coating of glass, and for receiving the impressions from etchings and engravings (introduced so advantageously into ceramic manufactures for about a century), producing the "*printed ware*." The colours which can be advantageously used "under the glaze" are few as compared with those employed above it.\* In the latter case, the paints used are enamel colours, that is, glasses of different kinds, mixed with metallic oxides, giving the colours sought.† The printing is but the employment of the colours that can be advantageously used "under the glaze," mixed with oil, and worked as ordinary printing-ink for engravings. Care is required as regards the paper for pressing the print on the ware, and for the dexterous removal of the paper after the pressure, so that the impression be not injured. To drive off the oil used as a vehicle for the colours, the ware, after "printing," is exposed at a low heat on a kiln, termed a "*hardening kiln*;" after which it is ready to be glazed. The materials of the glaze, which may vary according to the practice of different potteries, are mixed with water, so as to form a substance of about the consistency of cream. Into this the earthenware, either painted with colours which will not injure in the heat of the kiln into which it is next placed, or printed with colours of the like general kind, is dexterously dipped. Upon removal, all traces of the colouring are lost under a general slight coating of the finely comminuted materials of the glaze, the water being readily absorbed by the porous "*biscuit-ware*." It is now placed in saggars in a "*gloss kiln*," as it is termed, for about one day, exposed to a less heat than in the "*biscuit kiln*," but at the same time sufficient to reduce the coating upon the ware to a glass, disclosing the painting or printing under it, and preventing the access of liquids to the porous ware

\* Cobalt blue, chrome green, &c., which the heat of the "*gloss*," or glazing kiln, will not change. Red, from peroxide of iron, cannot be thus applied, the heat of the kiln converting the red into brown and black.

† These glasses generally are more readily fused than the kind of glaze employed, so that the latter is not injured by the firing, the enamel colour simply covering and uniting with it sufficiently. The glaze itself can be coloured with various mixtures with metallic oxides. For enamel colours consult the catalogue of the Vitreous Series.



beneath. The earthenware is then ready for the *Manufacture of earthenware.* market.

The materials of earthenware mixed, and ready for use. Ce. M. 1.

Piece thrown and turned, ready for the "biscuit kiln." Ce. M. 2.

Piece of earthenware, as taken after "firing" from the "biscuit" kiln. Ce. M. 3.

Piece of earthenware, printed as taken from the hardening kiln. Ce. M. 4.

Piece of earthenware, after firing in the "gloss" kiln, ready for the market. Ce. M. 5.

Ce. M. 1. to Ce. M. 6. *Presented by Mr. Lewis Dillwyn.*

While on the subject of earthenware, mention *Dip or dipt ware.* should be made of a very ingenious manufacture, apparently in use long before the present white earthenware was invented, commonly termed "*dipt*" or "*dip ware*." This kind of earthenware is still made, though not to so great an extent as formerly; "printed" and "*biscuit painted ware*" advantageously competing with it in lowness of price. In the manufacture of this ware, the prepared body or paste after being mixed as usual, and being "thrown" on the wheel to the form required, is handed over to the "*dip-turner*." This workman having received the "thrown" piece (a mug, for instance), in its rough state, places it on a lathe, and takes off its inequalities, even giving it a pattern, if thought desirable, by engine turning. Having coloured clays (either natural or artificially prepared) in a vessel with a spout that can be varied in form, the coloured clays being of the consistency of cream, he blows into this vessel through another tube, and thus forces the creamy clay out of the first-mentioned spout upon the piece of clay turning slowly on his lathe. In this manner, rings of coloured clay can be deposited on the revolving piece of clay, uniting with it. By dexterously dropping portions of the creamy clays, patterns also of different kinds and of different colours may be produced. Great varieties of design can thus be obtained. The arborescent or dendritic forms observed are also usually produced by the "*dip-turner*," who, after covering the



*Dip or dipt  
ware.*

turned piece of the original paste or body, in its clay state, with an evenly spread coating of his "dip" compound in its creamy condition, drops, before it becomes dry, another kind of "dip" compound, having a greater density than the first, upon it; and thus, by holding the piece so that the heavier compound or colour (should a simple one be employed,) can descend amid the moist first spread "dip," he permits it to disseminate its particles in an arborescent form. The pieces thus prepared are then merely fired in the "biscuit" kiln, and glazed in the "gloss" kiln for the market.

- Ce. M. 6. Specimen of "raw" clay thrown.
- Ce. M. 7. Specimen of "raw" clay, thrown and turned.
- Ce. M. 8. Shows the "raw" material, thrown, turned, and ribbed by coloured clays.
- Ce. M. 9. Exhibits similar substances, treated in the same manner, and fired.
- Ce. M. 10. The "raw" clay, thrown, turned, with the arborescent figure produced in the manner above mentioned.
- Ce. M. 11. A mug resulting from the latter kind of work, fired, ready for glazing.

Ce. M. 6 to Ce. M. 11. *Presented by Mr. Lewis Dillwyn.*

*Manufacture of  
porcelain.*

The manufacture of porcelain bears a general resemblance to that of earthenware, the differences relating chiefly to the composition of the pastes or bodies and glazes, to the arrangement of kilns fitted for greater heats properly to act upon more refractory materials, and to muffles or kilns for firing the various enamel colours employed upon the different forms given to the porcelain.\* According to the analyses of M. Laurent, the general composition of the Sèvres porcelain, from 1770 to 1836, was—

Silica	-	-	-	58·0
Alumina	-	-	-	34·5
Lime	-	-	-	4·5
Potash	-	-	-	3·0
				100·0

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\* Excellent details as to the manufacture of the Sèvres porcelain will be found in Brongniart's "*Traité des Arts Céramiques*." Paris, 1844.



The paste used for painting upon in 1843, was *Manufacture of porcelain.* nearly the same, being—

Silica	-	-	-	58·03
Alumina	-	-	-	33·94
Lime	-	-	-	4·58
Potash	-	-	-	2·97

The substances usually employed to form the paste or body are kaolin, china-stone, (*kaolin caillouteux*)\*, plastic clay (from Abondant, eastern edge of the Forêt de Dreux), the siliceous sand (nearly pure silica) of Aumont, near Creil, and chalk from the Colline de Bougival. According to M. Laurent, the composition of the kaolin and china-stone of Marognac used in the manufacture of the Sèvres porcelain, is as follows:—

		Kaolin.	China-stone.
Silica	-	57	83
Alumina	-	33	10
Potash	-	6	6
Lime	-	2	—
		<hr/> 98	<hr/> 99

The composition of the Meissen (Dresden) porcelain of 1825, chiefly differed, according to the analyses of M. Laurent, from that of Sèvres in containing scarcely any lime and more potash, these analyses giving, for the former†—

Silica	-	-	-	57·7
Alumina	-	-	-	36·0
Potash	-	-	-	5·2
Lime	-	-	-	0·3
Protoxide of iron	-	-	-	0·8
Manganese	-	-	-	traces.

In the composition of the Berlin porcelain of 1808, the proportion of silica was greater; the potash was

\* The kaolin gives porcelain more infusibility, while china-stone gives more translucency and fusibility. The kaolin used at Sèvres comes from St. Yrieix-la-Perche, 26 kilometres to the south of Limoges.

† The materials employed for porcelain of ordinary domestic use were,—

Kaolin from Aue	-	-	-	18	- - - (The Aue kaolin is
Kaolin from Sosa	-	-	-	18	now exhausted, 1852.)
Kaolin from Seilitz	-	-	-	36	
Felspar (Pegmatite?)	-	-	-	26	
Broken biscuit porcelain	-	-	-	2	



*Manufacture of* in less proportion than in the Meissen, and in greater quantity than in the Sèvres porcelain, having been, according to the analysis of M. Laurent,\*—

Silica	-	-	-	66·6
Alumina	-	-	-	28·0
Potash	-	-	-	3·4
Protoxide of iron	-	-	-	0·7
Manganese	-	-	-	0·6
Lime	-	-	-	0·3

The various English porcelains have not hitherto been subjected to much examination as to their chemical composition.† The ingredients are commonly Cornish or Devonian kaolin, Cornish china-stone, and flint, with prepared bones.‡ According to Aikin, the following was the composition of the body or paste of an English (Staffordshire) porcelain about 1840—

Cornish kaolin	-	-	-	31·0
Cornish china-stone	-	-	-	26·0
Flint	-	-	-	2·5
Prepared bones	-	-	-	40·5

M. Arnoux considers the soft porcelain commonly manufactured in England as nothing but that which

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For finer kinds, employed for ornamental purposes,—

Kaolin from Seilitz	-	-	-	37
Quartz	-	-	-	37
Lime from Pirna	-	-	-	17·5
Broken biscuit porcelain	-	-	-	8·5

\* The materials used in the Berlin porcelain are as follows:—

For domestic use.				For ornamental purposes.			
Kaolin from Morl	-	76		Kaolin from Morl	-	25	
Felspar	-	-	24	Kaolin from Beiderue	-	50	
				Felspar	-	-	15
				Pure (siliceous) sand	-	10	

† The subject is now under investigation in the laboratories of this Museum.

The chemical composition of English soft porcelains has chiefly engaged the attention of Mr. Cooper, according to whom the substances contained in three kinds were as follows:—

	I.	II.	III.
Silica	- - - 39·88	40·60	39·685
Alumina	- - - 21·48	24·15	24·650
Lime	- - - 10·06	14·22	14·175
Protoxide of iron	- } - 26·44	15·32	15·386
Phosphate of lime	- }		
Magnesia	- - - —	0·43	0·311
Alkali and loss	- - - 2·14	5·28	5·792

‡ In 1800, Spode introduced calcined bones into the body or paste of his porcelain at Stoke-upon-Trent, Staffordshire. The bones now used are chiefly obtained from Ireland and America.



is termed hard, from its greater hardness, modified by the presence of the phosphate of lime contained in the bones employed.\* He observes that about 24 factories are chiefly engaged upon soft porcelain in England, the greater part of their products sold in this country, the exports of it not exceeding (in 1852) 60,000*l.* in value. The hard porcelain of France successfully competes with the soft porcelain of England, being cheaper and more durable.†

The porosity of ordinary pottery, however valuable in hot climates for cooling water,‡ seems early to have suggested the use of a glazing, or thin glass covering, for the purpose of rendering it impervious to fluids. In the present state of our knowledge it would appear difficult to give a probable date for this invention, or even to assign it a locality. So little is known of the early intercourse of the Chinese with the nations adjoining them, and of these again with the more western countries of antiquity, as regards the potter's art, that even supposing the view taken of the progress of the potter's wheel to be approximately correct, and that early Chinese pottery was glazed, and that a knowledge of a process by which a glaze was formed, travelled with the wheel, we still remain in doubt how far the first glazing of pottery can be traced to that people. The early Chinese glazes do not appear to be known. Those we see upon their ancient porcelain would seem to be derived from the same substances as those now employed, namely, mixtures in which some felspar forms a chief ingredient, and which usually require "high firing," or considerable heat, to melt them. Such glazes would be little applicable to the ware of those ancient nations whose pottery has become known

\* Lecture on Ceramic Manufactures. As to the action of the bones, M. Arnoux remarks that when the other materials "begin to combine at a certain heat the bones being phosphate of lime, which cannot be decomposed by the silica, melt, without combining, into a sort of semi-transparent enamel, and being intimately mixed in the mass, give transparency in proportion to the quantity used."

† M. Arnoux mentions that there were (in 1852) 70 factories of hard porcelain in France, and that the value of the French exports of this porcelain had risen from 320,000*l.* in 1846 to 670,000*l.* in 1850, and was still largely on the increase.

‡ Probably used for that purpose at early times, seeing that the comparative coolness of water in porous vessels, from the reduction of temperature effected by the evaporation of the water oozing through them, would have been readily observed and appreciated in warm climates.



*Glazes.*

to us, and which for the most part was not of a very refractory kind. At the same time, although this kind of glazing may not have been applicable, even supposing the materials for it could be obtained, or that a knowledge of them so far existed as to lead to their discovery in other lands than China, a piece of glazed pottery, of any kind, could not fail to show the importance of a glaze, and produce a desire for its imitation.

The composition of glazes requires to be such that, when they are exposed to the necessary heat, they should unite with the body or paste, and that, in cooling, they should not split, crack, or *craze*, from occupying so much less volume in their fired state than previously that they cannot completely cover the pottery or porcelain beneath. The metallic or other bodies employed for glazes, as silicates or borates, firmly unite with the body or paste beneath, and thus the glass of the glaze becomes firmly united with it. The substances commonly used for glazes are quartz, flint, felspar, gypsum (sulphate of lime), borax, boracic acid, common salt (chloride of sodium), potash, soda, and oxide of lead. Some glazes are first formed into *frits*, imperfectly vitrified bodies so termed, and then pounded for use. Coloured glazes are formed with the addition of nearly pure oxides of manganese, copper, iron, chromium, cobalt, &c. Opaque glaze or enamel is made with oxide of tin, and sometimes with phosphate of lime.

*Assyrian and  
Babylonian  
glazes or ena-  
mels.*

When or wherever glazes upon baked clays may have originated it is certain that they have been used from remote times in Assyria and Babylon. Investigations at this establishment have shown, as regards the specimens of Babylonian bricks noticed beneath, that with a base of silicate of soda, or soda glass, an opaque white was obtained by means of the oxide of tin, while a yellow was formed by antimony and lead (antimoniate of lead—*Naples yellow*). The blue colour from copper was previously well known, while the occurrence of lead in the blue enamel, probably employed as a flux, was not previously ascertained. Thus the use of lead, antimony, and tin in glazes or enamels has to be carried many centuries further back among ancient nations than has been usually supposed. From



the manner in which these Babylonian bricks are coated, the composition running over and down the sides of the bricks, it would appear as if the glazing compound was put on while the face of the brick to be glazed was horizontal, the brick being then fired in that position to reduce the composition to the glassy state. The Assyrian enamelled bricks in this collection, and presented by Mr. Layard, would appear to show that similar glazes or enamels were probably employed by the Assyrians at a still earlier time.

Fragment of an enamelled brick, enamel much decomposed, from Nimroud (Nineveh). From analyses of Babylonian enamelled bricks, mentioned above, the white opaque colour would be stanniferous (like Ce. Vi. 6) while the yellow resembles that on Ce. Vi. 5, and is probably, like it, formed of lead and antimony. The blue green colour is due to copper, and the brown probably to iron. The brick itself is of baked clay, with impressions showing that it has been worked up with small vegetable stems, such as straw and grass. Many fine specimens of the like kind are to be seen in the British Museum. This brick may date from B.C. 800 to B.C. 900. *Collected and presented by Mr. Layard.*

Ce. Vi. 1.

Fragment of an enamelled brick from Khorsabad (Assyria). The white colour probably stanniferous (as above), the yellow formed from antimony and lead, and the green from copper. Body of the brick of the same kind as Ce. Vi. 1. A pebble is seen in the middle of the brick. Date probably about B.C. 700.

*Collected and presented by Mr. Layard.*

Ce. Vi. 2.

Smaller fragment of an enamelled brick of the same general character as Ce. Vi. 2. Date probably about B.C. 700. *Collected and presented by Mr. Layard.*

Ce. Vi. 3.

Part of a glazed or enamelled brick from Babylon, the glass coating being thick and extending over the corner of the brick, showing its mode of application in a fluid state on somewhat of an horizontal surface, part running over the sides. The blue colour of this glaze or enamel is due to the silicate of copper united with silicate of soda. The glaze also contains some lead, apparently used as a flux for the glass. A red colour on one side of the brick where the substance of the glaze ran over before firing, is due to the reduction

Ce. Vi. 4.



*Babylonian  
glazes or ena-  
mels.*

of the copper to a sub-oxide (the red oxide). The body of the enamel is a silicate of soda. Date may be about B.C. 600.

*Collected and presented by Mr. W. Kennett Loftus.*

Ce. Vi. 5.

Part of another glazed or enamelled brick from Babylon. The base of the enamel or glaze, silicate of soda, coloured by oxide of antimony and lead (Naples yellow). The enamel laid on when the brick was placed horizontally, with the face upwards. Date may be about B.C. 600.

*Collected and presented by Mr. W. Kennett Loftus.*

Ce. Vi. 6.

A white enamelled brick from Babylon. The white colour due to peroxide of tin. Date may be about B.C. 600.

*Collected and presented by Mr. W. Kennett Loftus.*

The bodies or pastes of all the bricks above mentioned, from Babylon and Assyria, contain calcareous matter in fair abundance.

*Egyptian glazes  
or enamels.*

The Egyptians largely employed glaze or enamel in covering small figures and other ornamental forms, the interior parts of which are formed of grains of sand cemented by melted matter, commonly silicate of soda. The greenish or greenish blue colour is due to silicate of soda and copper, and this cupreous enamel appears to have been that most largely employed. They did not confine this glazing to such compositions alone, for scarabæi and other figures are found carved out of a steatitic material, and have evidently been dipped in a similar glaze and fired, the steatitic material readily resisting the heat required for the fusion of the glaze.

The Egyptians are supposed not to have, in earlier times, known how to unite their glaze or enamel with true pottery. In the second and third centuries, however, of the Christian era, they are considered to have preserved traditions of their art, and to have applied the true cupreous glaze to real pottery, though still of a coarse kind.

Ce. Vi.

7—8.

Egyptian sepulchral figures, glazed with a cupriforous glass, applied after the figure has been moulded.

10—11.

Similar figures, not of good workmanship, broken to show the kind of paste or frit inside. The white interior is composed, according to analyses made in the laboratory of this museum, of fine sand, cemented by



silicate of soda, the soda probably mingled with the sand as a carbonate (it may have been derived from the Natron Lakes), and the whole then fired. *Egyptian glaze or enamels.*

Similar sepulchral figure. The glaze light coloured, tinted only with light green in places. Vesicular holes in various parts of the surface seem to point to a fair amount of firing. Ce. Vi. 12.

Figure of Bubastes, surmounted by Ra (the sun). The body finer than the former, approaching a frit, the cupriferous glaze has entered much inward. Ce. Vi. 13.

Small figure of Ptah-Sekeri-Hesar. The fracture shows a body or paste more advanced towards a glassy frit, coated with cupriferous glaze of a blue colour. Ce. Vi. 14.

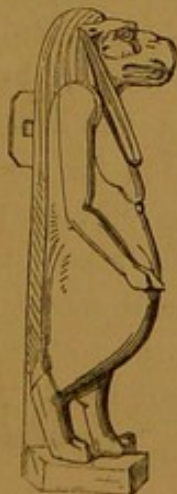
Fig. 2.



Sepulchral figure of Ankh-har, Governor of the South. The body and glaze appearing as of one substance, a blue glassy frit, the outside only more vitreous. Ce. Vi. 15.

Two small figures of Ta-hur (Thoueris). Body slightly varying. Glazes of different tints. Ce. Vi. 16.  
a & b.

Fig. 3.





*Egyptian glazes  
or enamels.*

- Ce. Vi. 17. Figure of Ra (the Sun). Body and glaze shown in the fractured base, somewhat more distinct from each other.
- Ce. Vi. 18. Numerous discs, bored and strung as beads. Body or paste, as shown by the broken bead, sandy and brown. Glaze, blue, cupriferous.
- Ce. Vi. 19. Various Egyptian scarabæi, bored for stringing, differently glazed. Fractured portions show various substances forming the interiors. While some appear ceramic or frit bodies, others are carved out of a steatitic mineral.
- Ce. Vi. 20. A low relief carved out of a steatitic substance, then dipped in the cupriferous glaze, and exposed to the heat needed for the melting of the glaze. Portions of a frit, covered with a blue glaze, were subsequently, with pieces of yellow arragonite, inlaid in cavities, carved in the steatitic material, filling up the general design. The cavities are shown to have been previously formed by such portions being coated with the green glaze.
- Ce. Vi. 20 b. The Sacred Eye, found with Egyptian mummies, usually near the incision made for evisceration, upon embalming. The paste or body a frit, of the same kind as those above mentioned, coated with cupriferous glaze; a blue black enamel representing the centre of the eye.

*Indian glazes  
or enamels.*

Ce. Vi. 20 c.

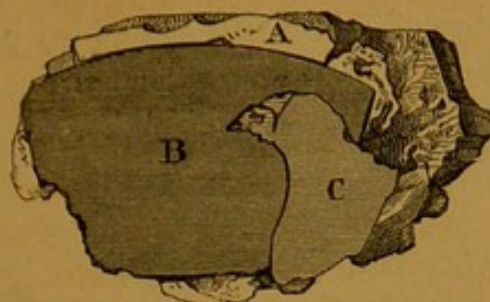
The Egyptian method of enamelling frits composed of siliceous sand, cemented by some alkaline silicate, seems to have been introduced at a subsequent time into India by the Mohammedans. In this specimen the frits are enamelled with different coloured glasses, the enamelled frits then cut, so as to form a design in mosaic when embedded on a wall of chunam or plaster. A portion of a bird (C) is represented on a turquoise blue ground (B), with a margin of white (A). The blue colour, probably formed by oxide of copper and silicate of soda, as in the Babylon enamelled brick, Ce. Vi. 4, is remarkable for the tint resembling the turquoise blue of the Sèvres porcelain. These enamelled frits have been used in India from the 13th century. They are still made, it is said, in Scinde. This example is from the tombs of the Kooth Dynasty, Golconda. Date, about the 15th century.

*Presented by Major Oliphant.*



*Indian glazes  
or enamels.*

Fig. 4.



The black glaze employed in the Greek vases, especially those found in the Campania, has been supposed to be, in great part, due to volcanic ashes spread by the brush over the portions required, the vase being then exposed to the heat necessary for their fusion. The white and other colours used upon these vases are not enamels, but coloured clays, or *engobes*, painted on the vases, after sketches of the design were executed on them. There are some excellent specimens in the British Museum, showing a freedom of hand employed in these sketches, where the engobes have peeled off, which much surpasses the work when covered by them; as might, indeed, be expected from the greater difficulty of working with coloured clays of the right consistency. According to M. Salvétat, who analyzed the black glaze of some Greek pottery (Campanian), it was composed of the following substances:—

Silica	-	-	-	46·3
Alumina	-	-	-	11·9
Lime	-	-	-	5·7
Soda	-	-	-	17·1
Oxide of iron	-	-	-	16·7

The quantity of soda in this compound, which otherwise does not very materially differ from some volcanic ashes, might lead to the supposition that it had been added as a flux. The whole, indeed, may have been artificial, essentially a soda glass with oxide of iron and some lime, the alumina being accidental. Be the compound natural or artificial, the painting with it on these vases shows the application of a glaze, on them, for ornamental purposes.

Early Greek vase, about 700 B.C. Body reddish. Ce. Vi. 21.  
Form as in the annexed sketch (fig. 5). Figures first



*Greek glazes.* sketched in red, then coloured by black glaze, and fired. Engobes of white and red added in parts, and portions of the figures picked out by scratching through the glaze with a point. Found at Vulci.

Fig. 5.



Ce. Vi, 22. Greek vase, between 400 and 500 B.C. Body reddish. Figures and other parts of the design drawn with black glaze upon the body, then fired. White engobe in part added. Detail of figures worked out by scratching through the glaze with a point. Form as in the annexed figure (fig. 6). The use of compasses shown by the circles round the pupils of the large representations of eyes. Found at Vulci.

Fig. 6.



Ce. Vi. 23. Greek vase, about 400 to 500 B.C. Body red. Figures and pattern drawn in black glaze (fig. 7).



Some white engobe. Minor details picked out by scratching through the glaze with a point. Found at Vulci. *Use of glaze in ornamenting Greek vases.*

Fig. 7.



Large Greek vase, 22 inches in height; three handles. Date about 400 B.C. to 500 B.C. Body red. Figures and pattern drawn in black glaze, which covers also a large part of the vase beneath. Some white engobe. Detail of figures picked out through the glaze by a point. Form as in the following sketch (fig. 8). Found at Vulci. Ce. Vi. 24.



*Use of glaze  
in ornamenting  
Greek vases.*

Fig. 8.



Ce. Vi. 25. Greek tazza,  $13\frac{1}{2}$  inches in diameter. Date about 400 B.C. Body red. Figures left in red by painting the other parts with black glaze. Details of figures freely sketched in black glaze (figs. 9 and 10). Found at Vulci.

Fig. 9.

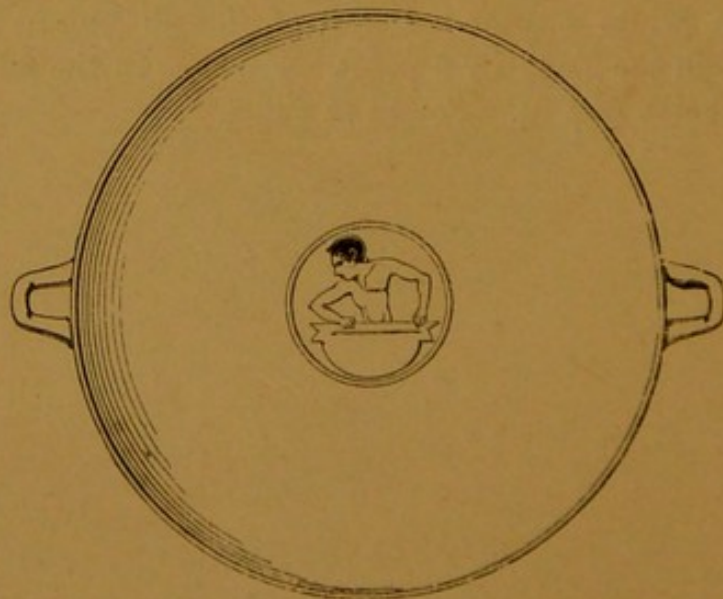
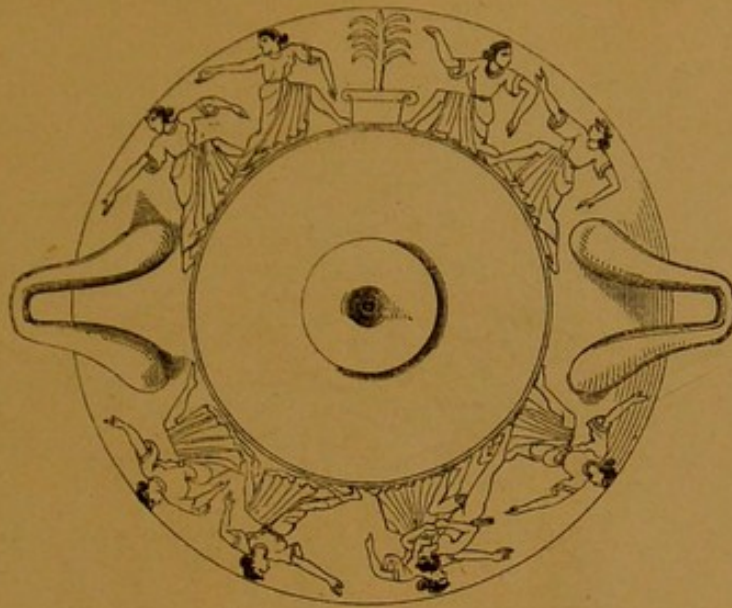




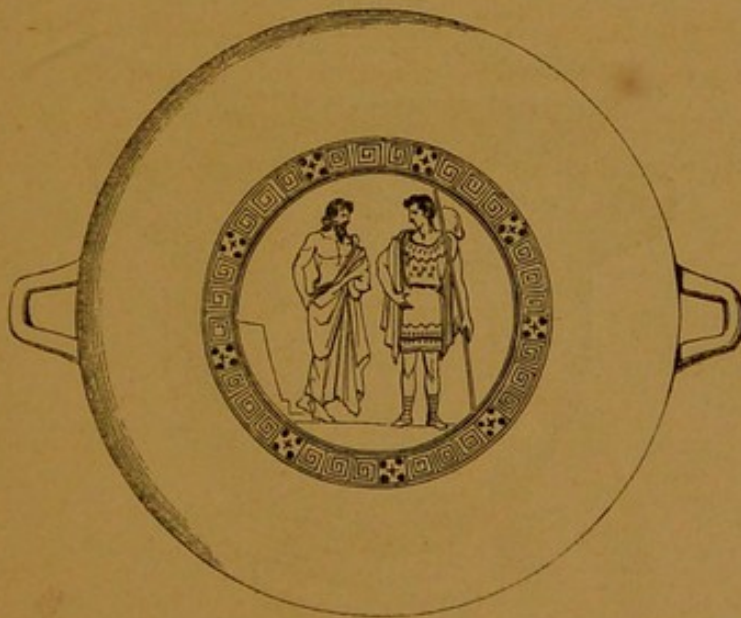
Fig. 10.

*Use of glaze  
in ornamenting  
Greek vases.*



Greek tazza, 11 inches diameter. Date about Ce. VI. 26.  
370 B.C. Figures left in red by painting with black  
glaze (figs. 11 and 12). Details of figures sketched in  
black glaze. Found at Vulci.

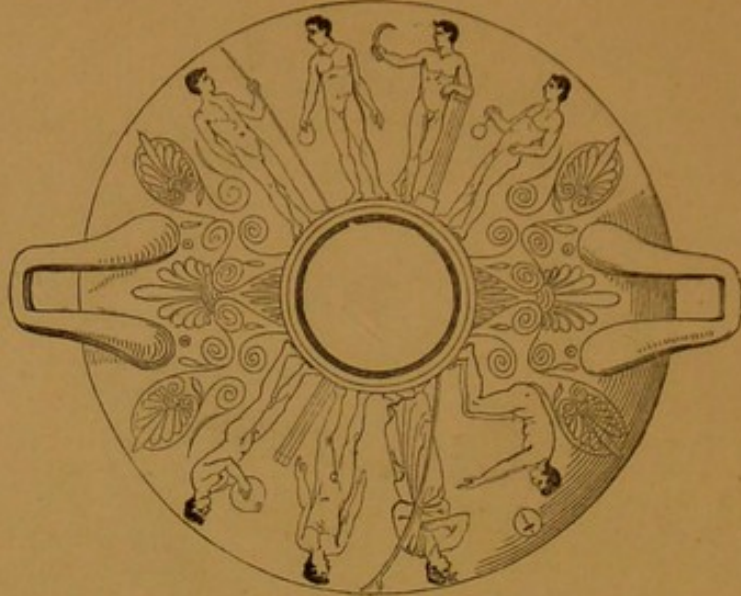
Fig. 11.





*Use of glaze  
in ornamenting  
Greek vases.*

Fig. 12.



Ce. Vi. 27. Greek vase,  $12\frac{1}{2}$  inches high, and 13 inches in diameter. Date about 400 B.C. Body red, and figures and pattern left in red by painting with black glaze (fig. 13). Detail of figures sketched in black glaze. Found at Ruvo, Naples.

Fig. 13.



Ce. Vi. 28. Large Greek tazza, 16 inches in diameter. Date about 270 B.C. Body red; figures, in red, left. Some white engobe. Pattern in part scratched with a point. Form as in the annexed sketches (figs. 14 and 15). Found at Ruvo.

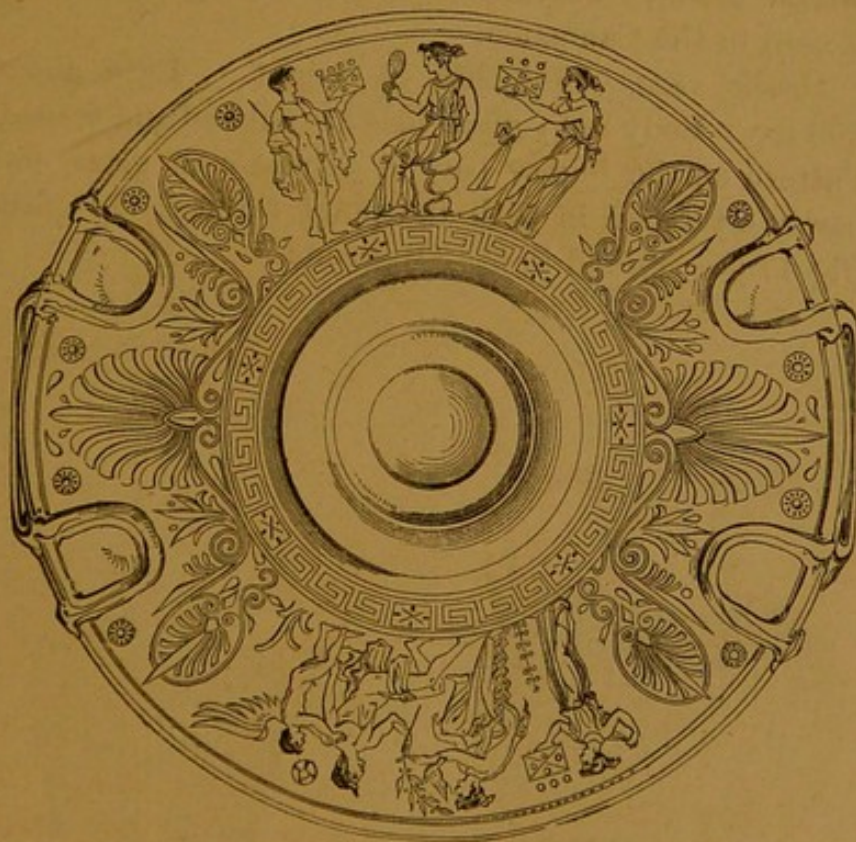


Fig. 14.

*Use of glaze  
in ornamenting  
Greek vases.*



Fig. 15.



Greek vase, 12 $\frac{1}{4}$  inches in length. Date about 300 B.C. Figures left in red, in same manner as above. Some white engobe. Form as in the figure (fig. 16). Found in the Campania.

Ce. Vi. 29



*Use of glaze  
in ornamenting  
Greek vases.*

Fig. 16.



Ce. Vi. 30. Greek vase, 10 inches high. Date about 200 B.C. Ribbed and turned. Wholly covered outside, except the bottom, with black glaze. Only partially glazed inside. Form as in annexed sketch (fig. 17 a). Found in the Campania.

Ce. Vi. 31. Greek vase, 13 inches in height. Date about 200 B.C. Body red; glaze black. Ribbed and turned. Pattern on the higher part in engobe over glaze, and partly scratched in with the point through the glaze (fig. 17 b). Found in the Campania.

Fig. 17 a.



Fig. 17 b.





Greek vase, 11 inches in height. Date about 200 B.C. Coarse design. Picked out in red by painting the remainder of the vase with black glaze. Found in the Campania. *Use of glaze in ornamenting Greek vases.* Ce. Vi. 32.

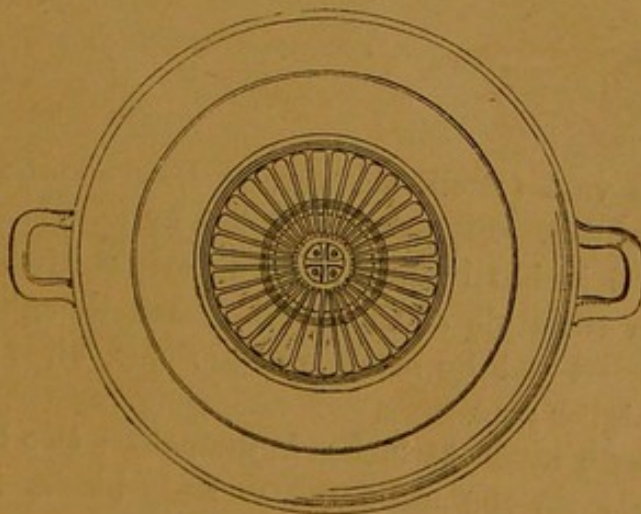
Greek vase, 10½ inches in height. Body red. Date about 300 B.C. Figures left in red by the black glaze; latter very brilliant. Form as in annexed figure (fig. 18). Nola. Ce. Vi. 33.

Fig. 18.



Greek tazza, 8 inches in diameter. Body red. Glaze black and brilliant. Beautifully turned, with elegant impressed pattern inside. Form as in annexed figures (figs. 19 and 20). Nola. Ce. Vi. 34.

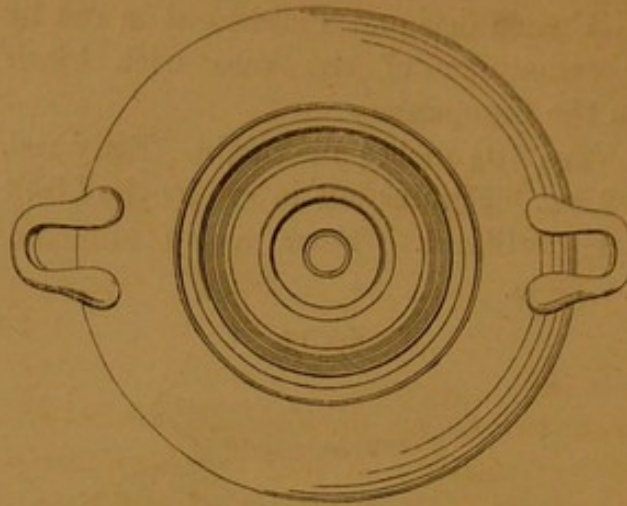
Fig. 19.





*Use of glaze  
in ornamenting  
Greek vases.*

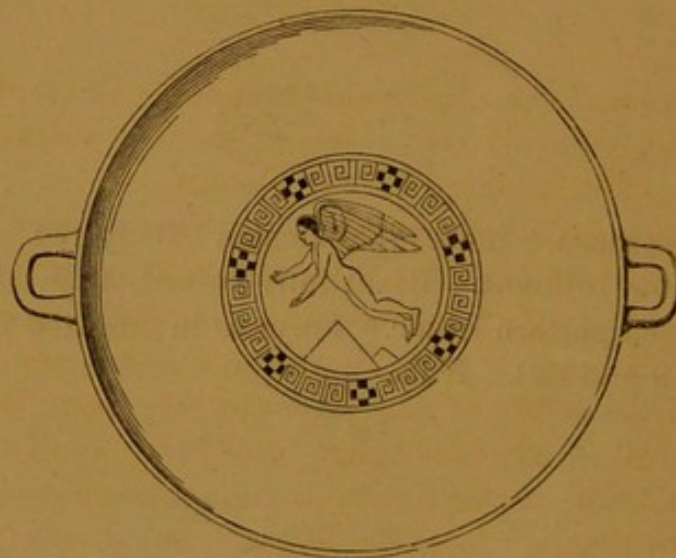
Fig. 20.



Ce. Vi. 35. Greek bottle (?). Date about 200 B.C. Body red, glaze black. Slightly ribbed. Found in the Campania.

Ce. Vi. 36. Greek tazza, 8 inches in diameter. Body reddish. Figures and pattern left red by painting with black glaze (fig. 21). Found in the Campania.

Fig. 21.



Ce. Vi. 37. Greek vase (Basilicate ware). Date about 200 B.C. Body reddish. Figures in red, left by the glaze.

Ce. Vi. 38. Vase, 9 inches in height, of uncertain kind. Executed in the style of the Greek vases, though coarse. Figures left red by black glaze. Some white engobe in the higher part.

Ce. Vi. 39. Etruscan tazza,  $4\frac{1}{2}$  inches in diameter; two handles. Date between 400 and 500 B.C. Body black. Smooth



black surface or glaze. Part of tazza ground down after firing (fig. 22). *Use of glaze in ornamenting Etruscan vases.*

Fig. 22.



Etruscan tazza,  $3\frac{3}{4}$  inches in diameter. Body black, ribbed outside in part by scratching with a tool (fig. 23). Smooth black exterior surface. Ce. Vi. 40.

Fig. 23.



Etruscan vase, with one handle. Date, 400 to 500 B.C. Body black. Smooth surface outside, like glaze. Vessel turned for the pattern. Ce. Vi. 41.

Lead in glazes or enamels has been above (p. 31) *Lead glazes.* seen to have been found in the enamel of Babylon bricks. Brongniart mentions a Roman lamp in the Bibliothèque Imperiale, at Paris, of about the second or third century of the Christian era, with a green cupreous glaze containing lead; as also a small statuette of Venus Anadyomene, supposed to be less ancient than the lamp, in like manner covered with a green glaze containing lead. The Arabs employed a plumbiferous glaze in the ninth century; some fragments of Arab pottery of that date, in the Ceramic Museum at Sèvres, have a lead glaze. Two broken vases (the specimens now at Sèvres) were taken from a tomb of the date of 1120, in the celebrated Abbaye de Jumièges, with plumbiferous glazes, one yellowish, the other a brilliant green. How far these vases may have been manufactured in France is uncertain; but if the



*Lead glazes.*

statement of Passeri be well founded, that, in 1100, a lead glaze was used for the pottery then manufactured at Pesaro, by covering the body or paste with "chalk of lead," plumbiferous glazes were employed in Europe in the early part of the twelfth century. Lead glaze was in use in Alsace in the thirteenth century, and Stazlstatt, who died in 1283, is commonly reputed as the first person who glazed fictile ware in Alsace with lead.

The Moors introduced their lead glaze into Spain in the thirteenth century, and about that time it seems to have spread in different countries. The tiles used in the castles and abbeys of the thirteenth century in France (Abbaye de Voulton, near Provins, Fontainebleau, Château de Gisors, St. Etienne d'Agen) were covered with a lead glaze, as also the various Norman tiles which have been used in the churches and castles of England. From its easy fusibility, this glaze seems to have been very commonly employed in the fourteenth, fifteenth, and sixteenth centuries.

Ce. Vi. 42.

Tile from an ancient kiln, Droitwich, Cheshire. Design, lion (yellow) upon red ground inside a circle, with fleur-de-lis filling up the corners of the square tile. Lead glaze. Date, end of 13th century.

Ce. Vi. 43.

Tile from same place. Design, arms of England.

Ce. Vi. 44.

Another tile from the same place. Design, letters A. B. C. D., &c. round a six-petalled flower.

Ce. Vi. 45.

Another tile from the same place. Design, two birds on each side of an ornament passing diagonally across the tile.

Ce. Vi. 46.

Tile. Design, double-headed eagle inside a circle, yellow, upon a red ground. Date, about 1300.

Ce. Vi. 47.

Tile. Design, a mermaid in a circle, with fleur-de-lis, in yellow on yellow, ground. Date, 15th century.

Ce. Vi. 48.

Tile. Design, crown above M, in yellow, upon a red ground. Malvern, 15th century.

Ce. Vi. 49.

Fragment of tile. Design, Gothic, with date of 36th Henry VI. (1458), on the upper side. Malvern.

Ce. Vi. 50.

Tile, part of several forming a general design. East Hampstead Park, Berkshire. 15th century.

*Presented by the Marquess of Downshire.*



Two pressed tiles, one with 'Thomas' reversed. *Lead glazes.*  
Found at Castle Acre, Norfolk. Supposed made at Ce. Vi. 51.  
Bawsey, Lynn, 14th century.

Pressed tile, one of four forming a design. Tavistock, Ce. Vi. 52.  
North Devon. About 16th century.

Lead glaze still continues, from its ready fusibility, to be much employed in ordinary pottery, as also in common earthenware, though there has been a strong desire, as much as possible, to avoid such glazing, and to use borax instead of it. Plott, in his History of Staffordshire, mentions the method of using lead for glazing the ware then (1686) made at Burslem, whence it appears that the prepared clays, wrought into the forms required, and covered with the materials of the glaze, were fired at the same time. The following may be taken as examples of the composition of the plumbiferous glazes used for ordinary English earthenware :—

		Parts.
Carbonate of lead	- -	66
Cornish china-stone	- -	22
Flint	- - -	12

*Common Printed-ware Glaze.*

Carbonate of lead	- -	45
Cornish china-stone	- -	28
Flint	- - -	13
Flint glass	- -	14

The annexed are examples of glazes in which lead is mixed, used for some of the soft English porcelains :—

I.

		Parts.
Cornish china-stone	- -	100
Calcined flint	- -	60
Carbonate of lime	- -	25
Cornish kaolin	- -	10
Soda	- - -	10
Borax	- -	60
Carbonate of lead	- -	30

These are fritted together with 20 per cent. of carbonate of lead, and 10 per cent. of flint.



*Lead glazes.*

## II.

	Parts.
Cornish china-stone - - -	34
Chalk - - -	17
Flint - - -	15
Borax - - -	34
	<hr/>
	100
	<hr/>
Of this composition, fritted -	69
Cornish china-stone -	10
Carbonate of lead -	21

*Tin glazes, or enamels.*

The use of tin in glazes or enamels, forming an important colourless coating for ordinary pottery, so that it can receive painting with advantage, the oxide of tin giving a white opaque character to the glaze, from the dissemination of its particles, imbedded uncombined amid the glass, has been usually supposed to have originated with the Persians and Arabians. We have seen, however, that tin in such enamels or glazes was used in Assyria and Babylon (p. 32. Ce. Vi. 6). Stanniferous glaze has not yet been found among the productions of the ancient Chinese. Brongniart infers that tin glazes or enamels were known to the Arabs of Northern Africa in the ninth century. From the evidence of the bricks with stanniferous glazes from Babylon and Nineveh, the use of such glazes may readily have been derived from the countries east of the Mediterranean. The tiles employed at the tomb of Mahomet at Medina, built in 707, have, however, neither tin nor lead in their glaze. The paste of one of these tiles, examined at Sèvres, was white, sandy, and hard, containing 89·95 silica, 3·87 alumina and iron, 2·00 lime, 0·51 magnesia, and moisture 3·00. The glaze is fine, and of two colours, blue and green, with a black line between, dividing the tile in its length.

Stanniferous glaze seems clearly to have been introduced into Europe by the Arabs or Moors during their power in Spain. There still remain some beautiful works in enamel tiles in that country, the largest amount at the Moorish palace of the Alhambra, stan-



niferous glaze being often employed upon the tiles there used. The dates of the earlier of these tiles at the Alhambra would range from 1273 to 1302. Tiles of a like general kind are manufactured at Valencia at the present day. *Tin glazes or enamels.*

Fragment of an early tile from the Alhambra. Paste or body reddish, upon the face of which a coating of white opaque stanniferous enamel was spread, and upon this the design was subsequently painted in blue and brown enamel. The brown enamel, when viewed in a proper light, is seen to be iridescent. Ce. Vi. 53.

Fragment of a tile from the Alhambra, also of early date. Paste reddish. Design only partly executed in white enamel, the remainder formed by green and black enamel, and by uncovered portions of the paste or body. Ce. Vi. 54.

Large fragment of a tile from the Alhambra. Paste reddish. Design, first impressed on the surface of the tile, and including in the centre a shield, with a bend having an Arabic inscription. A coating of white stanniferous enamel was then applied, upon parts of which blue and brown enamels were painted, leaving portions white. Considered of later date than the preceding. Ce. Vi. 55.

Smaller tile from the Alhambra. Paste brown. Design impressed, and the surface then covered with opaque white stanniferous enamel, upon which blue, brown and green enamels were subsequently added. Date probably not far removed from the preceding (Ce. Vi. 55). Ce. Vi. 56.

Fragment of Hispano-Moorish tile from the Alcaza, Seville. Paste brown. Surface first covered with white opaque enamel, upon which the design was sketched in brown, some parts being subsequently covered with blue, light brown, and yellow enamels, others remaining white. Ce. Vi. 57.

Small tile from the Alcaza, Seville, showing that all there employed were not first covered with the white opaque stanniferous glaze, since the surface of the paste (light brown), in this specimen, was covered directly by a blue enamel, like the enamelled Babylon brick, Ce. Vi. 4. Ce. Vi. 57b.

Part of a tile or brick from the Alhambra, apparently having formed the corner of some work, as two Ce. Vi. 58.



*Tin glazes or enamels.*

surfaces are enamelled. Paste, light brown. The two surfaces first covered by opaque white stanniferous enamel, upon which the design was formed in blue enamel, leaving portions of the white, on some of which yellow and light brown enamels were subsequently added. Date apparently much removed from that of the early tiles of the Alhambra.

Though Moorish tiles were probably introduced into Italy at the conquest of Majorca by the Pisans in 1115, and such tiles were sufficiently esteemed to be employed for ornamental purposes in the churches of Pisa and other places, the exact manner and time when a knowledge of the tin glaze passed into Italy is not so clear. It is considered to have been there first used about 1415-20, by Luca della Robbia,\* the Florentine sculptor, so celebrated for his terra cotta figures and bas-reliefs, covered with stanniferous glaze. Although he chiefly executed Madonnas, Scripture subjects, and architectural ornaments, Luca della Robbia also made enamelled tiles. He died in 1420. During his lifetime, and after his death, his brothers Ottaviano and Agostino, and his nephew Luca and great-nephew Girolamo, executed the same kinds of work to about the year 1560, altogether a period of about 150 years. The colours employed by them were yellow, opaque blue, green, and violet.

Majolica or Raffaele ware,† which has become so celebrated, arose from the power to execute paintings on the surfaces given by the stanniferous enamel. The early specimens of this ware resemble the Moorish pottery, whence it was derived. Passeri‡ describes

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\* Luca della Robbia, born in 1388, was eminent as a sculptor in bronze and marble, working at Florence and Rimini, before he modelled in clay for terra cottas.

† The term "majolica" is derived from Majorca, whence the Moorish ware was first introduced into Italy. The term "Raffaele" arose from the designs of Raffaele having been employed for some of it. Though Raffaele may not have painted on the ware itself, he seems to have sometimes, at least, furnished the designs, as well as his scholars, since, in writing to the Duchess of Urbino, he informs that princess that the designs are ready which she had desired for porcelain for her sideboard. (Marryat, *Hist. of Pottery and Porcelain*, p. 11.) Some of the designs are also considered to have been taken from the engravings of Raffaele's works by Marco Antonio.

‡ *Istoria delle Pitture in Majolica fatte in Pesaro e nel luoghi circonvicini*. A work first printed at Venice, in 1752, and reprinted at Bologna, in 1775. Another edition, edited by Ignazio Montanari, appeared in 1833. All these are exceedingly scarce. A translation, in French, with an Appendix by the translator, M. Delange, was published in Paris, December 1853.



the process. The body or paste was first fixed, and then, by immersion, covered by a composition of oxide of lead, oxide of tin, and white earth, the tin being increased as the enamel was required to be white and hard. According to Brongniart, there is no colour on the Majolica ware arising from gold.\* This ware was in the most flourishing state from 1540 to 1560, and declined in importance after 1574. Duke Guidobaldo II. of Urbino greatly encouraged its manufacture, giving designs of Raffaele and of his pupils to his Majolica works. Many painters became noted for their labours on this ware.† Pesaro, Gubbio, and Urbino, were the places in which this ware was manufactured from the middle of the 15th to the beginning of the 16th century. It afterwards was extended to Rimini, Faenza, Forli, and other places in Italy. Some of the early ware, known as *Mezza Majolica*, was remarkable for an iridescent glaze; of this glaze the ruby color was peculiar to Gubbio and Pesaro.‡

*Tin glazes or enamels.*

Mezza Majolica, with iridescent or "madreperla" glazes, apparently due to an extremely thin vitreous film. From the ruby colour of portions of the glaze, it was probably manufactured at either Gubbio or Pesaro. Large letter E in the centre of the plate. Date about 1510-20. Ce. Vi. 59.

Good example of the Majolica of the best time, useful as showing the colours then employed. The design is Mucius Scaevola burning his right hand before King Porsenna. The arms of the Duke of Urbino are painted on the rim of the plate. Inscription on the back, G. V. V. D. Munus F. Andrez, Volaterrano.—Mutio ib la sua destra erante cocie. Date about . Ce. Vi. 60.

\* The gold purple, or purple precipitate of Cassius, was not known until 1585.

† This manufacture was patronized for 200 years by the Dukes of Urbino. Francesco Maria delle Rovere added Gubbio to the places making Majolica ware. It ceased with Duke Francesco Maria II., who, being overwhelmed with debt, dismissed his best artists, and the ruin of the manufacture followed. He died in 1631. In 1772 Cardinal Stophani endeavoured to re-establish the Majolica works of Urbino, and its products had some celebrity in 1775.

‡ Majolica was manufactured at Nuremberg by Hirschvögel, an artist of that town, who, travelling in Italy in 1503, visited Urbino, where he learned the art of making this ware. His works are ornamented in relief. A Majolica manufacture was established in France, at Nevers, by Louis Gonzaga, Duke of Nevers, between 1570-90. It is considered difficult to distinguish the early works of Nevers from the Italian Majolica. —Marryat's Hist. of Pottery and Porcelain, p. 28.



Tin glazes or  
enamels.

Ce. Vi. 61. Another piece of the best period, also exhibiting the colours then employed. On the back it is marked "Astrologia, 1545." The astrologers only form a portion of the design; a young man, in the costume of the time, being represented on one side, playing the organ, a servant, behind the latter, blowing bellows.

Ce. Vi. 62. Majolica plate. Not only useful as pointing to the colours employed, but as showing, by a finger mark, that the stanniferous ground and colours upon it were in a thick pasty state before firing. On the back, M.DXXXIIII·F·ATHANASIVS·B·M. Three coats of arms on the rim.\*

By a careful inspection of the colours employed in Ce. Vi. 60, 61, and 62, it will be observed that a blue, yellow, light brown, and blueish black, with their mixtures, are alone those used.

Ce. Vi. 63. Majolica plate, showing the employment of chiefly one colour, a dull green, yellow and black being very slightly used.

Ce. Vi. 63 b. Majolica plate, with the following inscription on the back:—*Amor Crudele con sue uoglie prave fecie Aristotil portar freno e sella, 1547.* The blue colour of part of this inscription is brought out only where the stanniferous glaze passes over the writing.

Ce. Vi. 64. Majolica plate, of later date. Design, Eve offering Adam an apple (fig. 24).

Fig. 24.



\* In the Appendix of M. Delange's translation of Passeri's work, p. 111, a specimen of similar kind is attributed to Baldasara-Manara, of Faenza.



Bernard Palissy,\* so noted for his ware in relief, *Tin glazes or enamels.* beautifully modelled, used stanniferous enamel (the production of which cost him much time), and on this coloured enamels were employed.

Dish of Palissy ware. In the centre a fish modelled and coloured from nature, surrounded by dispersed shells and ferns, with a lizard, frog, snake, and insects, all also modelled and coloured in enamels from nature. The specimen is highly illustrative of this ware. Ce. Vi. 65.

The famous Delft ware, considered to have been established about 1600, was also covered by a tin enamel, upon which the various designs were executed.

Delft dish. The enamel of the greenish tint and brilliancy for which the ware was celebrated. Probably an early specimen of it. Design, various coloured enamels painted upon the fundamental stanniferous enamel, and intended to imitate oriental porcelain. Mark on the back, also, an imitation of the Chinese or Japanese marks. Ce. Vi. 66.

It is remarkable that the bodies or pastes employed by Lucca della Robbia, and by the manufacturers of the Majolica and Delft ware, should so much resemble each other, as if a knowledge of their composition had been obtained from each other. Thus, according to M. Brongniart, analyses at the Sèvres laboratories gave—

	Silica.	Alumina.	Lime.	Manganese.	Iron.	Carbonic Acid and Loss.	
Lucca della Robbia - -	49·65	15·50	22·40	0·17	3·70	8·58	Effervesces.
Majolica - - - -	48·00	17·50	20·12	1·17	3·75	9·46	Effervesces.
Delft - - - -	49·07	16·19	18·01	0·82	2·82	13·09	Effervesces.

\* Bernard Palissy was born of poor parents, in the diocese of Agen, at the beginning of the 16th century. He was a most enterprising man. While following land surveying for subsistence, he studied painting and the chemistry of the day. In 1539 he lived by painting at Saintes; and while there, seeing a beautiful cup of enamelled pottery, he laboured to discover the secret of the enamel. He spent all his money in vain attempts for sixteen years to imitate it, and was involved in much misery. Success finally crowned his labours. He died in prison about 1589, at about the age of 90, having been there confined from adherence to the Protestant faith that he had embraced. His ware has become famous, and is remarkable for the number of pieces executed in relief of the reptiles, fish, plants, and even the fossil shells of the environs of Paris, all executed with the greatest care.



*Tin glazes or enamels.*

It is not the less remarkable that the Nineveh and Babylonian enamelled bricks should, as has been seen above (p. 32), also have been calcareous.

The Palissy ware is differently composed, it does not contain calcareous matter, and does not effervesce; neither is it very fusible, being indeed chiefly formed of silica and alumina. Analyses at Sèvres gave for its constituent substances—

Silica	-	-	-	-	67.50
Alumina	-	-	-	-	28.51
Lime	-	-	-	-	1.52
Iron	-	-	-	-	2.05
Loss	-	-	-	-	0.42

*Felspar glazes.*

The knowledge of felspar glazes, or those in which felspar more or less forms a marked ingredient, seems to have been introduced into Europe with that of the composition of the Chinese porcelain pastes or bodies; so that as European imitations of the latter extended the use of felspathic glazes also spread. These glazes usually require a far greater heat for fusion than those which are employed for ordinary pottery, a large proportion of which would be melted by the heat required for the firing of true porcelain and their glazes. According to Brongniart the Chinese felspathic glazes are composed of selected felspar, finely pounded, gypsum (*che-kao*), lime, and potash, the latter obtained by burning ferns.

Though, doubtless, many modifications may have been made in the Meissen (Dresden) glazes since the first European porcelain works were carried on at that place at the commencement of the eighteenth century, the glazes there in use are interesting, as probably pointing somewhat to the composition of those early employed. The following is noticed as the Meissen glaze of 1836—

Rock crystal (pure quartz) calcined	-	-	-	37.0
Kaolin of Seilitz, calcined	-	-	-	37.0
Compact limestone of Neuntmamsdorf,				
near Pirna	-	-	-	17.5
Pieces of porcelain	-	-	-	8.5

The glaze of the Berlin porcelain was, in 1836 composed of—



Kaolin of Morl	-	-	-	31	<i>Felspar glazes.</i>
Quartz sand	-	-	-	43	
Gypsum	-	-	-	14	
Pieces of porcelain	-	-	-	12	

The Sèvres glaze for porcelain in 1842 seems to have been little else than China stone (pegmatite), formed of quartz and felspar, the composition of which was, from the analyses of M. Salvétat, essentially a silicate of alumina with a silicate of potash.

Silica	-	-	-	74·3
Alumina	-	-	-	18·3
Potash	-	-	-	6·5
Lime	-	-	-	0·4
Magnesia	-	-	-	0·2
Loss	-	-	-	0·3

For the English porcelain glaze, Cornish china-stone usually constitutes an important ingredient, a frit being not unfrequently made with it and borax, flint, lime, or other substances. Lead used to be employed more than it now is in such glazes.

The following is given by Dr. Ronalds and Dr. Richardson,\* as considered excellent in 1848 :—

Cornish china-stone	25	Fritted in gloss oven, and then the fol- lowing mixture used - - -	Frit	-	-	26
Soda	-		China-stone	-	-	26
Borax	-		White lead	-	-	31
Nitre	-		Flint	-	-	7
			Carb. lime	-	-	7
			Oxide of tin	-	-	3

A felspathic glaze was made by Mr. Rose, of Coleport, without lead, an account of which was published in the Transactions of the Society of Arts for 1820. It was composed as follows :—

Welshpool felspar	-	-	44
Sand	-	-	8
Kaolin	-	-	5
Borax	-	-	28
Potash and soda	-	-	10
			—
			95
			—

This was fritted and three parts of borax added, making 98 parts in the whole.

\* See their additions to their translation of Knapp's Chemical Technology, vol. ii., p. 466.



*Felspar glazes.* Piece of thick porcelain, a portion covered with  
 Ce. Vi. 67. felspathic glaze, from the Porcelain Tower, Nanking.  
 Obtained from the high priest at the tower. Date,  
 1411. *Presented by the Duke of Northumberland.*

Ce. Vi. 68 & 69. Two earthenware tiles, from the Porcelain Tower,  
 one part covered with a green glaze.

*Presented by the Duke of Northumberland.*

Ce. Vi. 70 Cup and saucer of Chinese porcelain, termed "egg-  
 a & b. shell," from its thinness and lightness. Felspathic  
 glaze, with design in black and flesh-colour enamels.

Ce. Vi. 71. Jar of Chinese porcelain, covered with felspar glaze,  
 containing copper, the latter in a state of sub-oxide  
 (the red oxide), probably reduced from the blue silicate,  
 as is seen to have been accidentally the case, on the  
 enamelled Babylon brick, Ce. Vi. 4. (p. 31).

Ce. Vi. 72. Jar of Chinese porcelain, covered by a similar glaze,  
 but in this case the blue silicate has been only par-  
 tially reduced to the red sub-oxide. Thus a portion  
 remains of a purple colour from the minor dissemi-  
 nation of the sub-oxide amid the silicate of copper.  
 These processes have not, as yet, been successfully  
 imitated in Europe.

Ce. Vi. 73. Large jar or vase of Chinese porcelain. Glaze, fels-  
 pathic, of a yellowish brown colour, covering the white  
 porcelain body. Design finely worked in relief, pos-  
 sibly upon an original rough impression from a mould.

Ce. Vi. 74. Ancient Chinese jar or vase illustrative of the mode  
 of producing the ware often termed *Cracklin China*.  
 The white porcelain paste, or body, is in part covered  
 with a brown felspathic enamel, and partly with  
*cracklin* glaze, the latter artificially produced by  
 employing a thick opaque enamel, that, upon firing,  
 split in various directions or *crazed* (p. 30), while the  
 brown enamel spread over the other portion, upon  
 which a design has been raised in relief, was not  
 cracked. Part of this relief design shows the ornament  
 often known as the Greek fret.\*

Ce. Vi. 75 Cups of brown Chinese porcelain, with an interior  
 a & b. and base of *cracklin* glaze. The *cracklin* of a fine  
 character. Greek fret pattern on both cups.

Ce. Vi. 74 & 75. *Presented by Mr. Harry Parks.*

\* For a similar fret pattern, see also a statuette among the Mexican pottery.



*Salt glaze.*

Salt glaze, or one in which common salt (chloride of sodium) by evaporation amid ware, in its biscuit state, glazes it, was first employed by Messrs. Palmer and Bagnel, at their potteries at Burslem, Staffordshire, in 1680.\* Requiring very high temperature, and not being considered so applicable as other glazes, it is only employed at present for special purposes. Salt glaze is used for vessels to contain acids and penetrating and corrosive liquids. It is also largely employed for drain and chimney pipes, and for the stone-ware insulators of the wires of electric telegraphs.

The glazing is effected by throwing common salt into a kiln containing the ware, towards the end of the firing, through apertures constructed for the purpose. The salt is vaporised by the heat of the kiln, the vapour filling it, and surrounding the various vessels. The vapour and the silica of the surface of the ware act on each other, through the medium of the water from the flame of the furnace, the oxygen of the water producing soda with the sodium of the salt, and thus a thin gloss of silicate of soda is formed over the biscuit ware.

Specimens of brown stone ware, with salt glaze.

Ce. Vi. 76, 77.

Smearing, as it is termed, is produced by the evaporation of certain glazes in closed saggers. Thus in the earthenware kilns, where common glazes are employed upon the ware in the saggers, if these last be closed, and the heat be sufficient, other biscuit ware in the saggers may be slightly covered with a glaze coating, or be *smeared*, by the evaporation from the glazes. Certain compositions may also be placed in the bottom of the closed saggers, and by their evaporation the ware in them be smeared. The compositions employed are various, and salt is sometimes added; for example, a compound of 67 parts of common salt, 28 parts of potash, and 5 of oxide of lead is used.

*Smearing.*


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\* See account of Staffordshire pottery.



## ROMAN RED LUSTROUS WARE.

The use of this kind of pottery seems to have extended with the Roman empire, fragments of it having been discovered wherever the Roman people had settled after their conquests. The date of its manufacture is considered to extend from the first century B.C. to the third century of our time.

It was apparently employed by them for domestic purposes, as earthenware and porcelain now are in this and many other countries. The paste of the ware is usually of a fine sealing-wax red colour, well worked before it was wrought into vessels of various forms. It is commonly well manufactured, the plain pieces bearing the marks of having been turned on the lathe, and the externally moulded ware is in like manner carefully finished inside. The red colour is derived from the peroxide of iron, which has been supposed to have been purposely introduced into the paste or body, commonly a compound of silica mingled with the silicates of alumina and lime. The glaze is generally brilliant, unless it has been decomposed from being subjected to unfavourable conditions when buried in the earth, and appears to have been formed of a silicate with an alkalino-earthly base, coloured by peroxide of iron. A piece of this ware found at Châtelet, and analysed at Sèvres by M. Salvétat, was composed of the following substances:—

Silica	-	-	64·00
Alumina	-	-	17·77
Oxide of iron	-	-	10·23
Lime	-	-	4·86
Water	-	-	2·29

The following are analyses made at the Museum of Practical Geology, under the direction of Dr. Percy,



by Messrs. Philipps and Smith, of two fragments of *Roman red lustrous ware*.  
this ware found in London :—

	I.	II.
Silica - -	54·45	60·67
Alumina - -	22·08	20·96
Peroxide of Iron - -	7·31	5·95
Lime - -	9·76	6·77
Magnesia - -	1·67	1·22
Potash - -	3·22	Alkalies in small quantities.
Soda - -	1·76	

Thus, while silica and alumina are the chief substances, there is much lime, and also peroxide of iron.

M. Brongniart observes, respecting this ware, "that it was worked in the most perfect manner, and with the aid of the greater part of the processes and means now employed in the most perfect manufacture."\* The moulding seems to have been so conducted that, with numerous stamps of different kinds, a great variety of pattern could be produced. These stamps appear to have been impressed upon a general mould, often of the same clay as that of the ware, afterwards fired, into which the moist paste was pressed, the mould being formed of the same paste as the ware itself, and baked prior to use. It follows that the paste, or prepared clay body, would be less, from shrinkage, after drying and firing than the baked mould. If the latter were turned inside, in its paste state, as probably it was, before the impressions from the stamps, the marks of the turning on a lathe would be impressed on the paste of the future piece of ware inside it; and thus the otherwise difficult problem of how some of the marks from the lathe and the raised figures of the pattern are sometimes singularly mixed may be readily accounted for. The moist paste of the ware inside, in the general mould, could readily be turned after it had been pressed properly against the latter, so that the fine work we see need not have been handled after pressure into the general mould,

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\* Essai sur les Arts Céramiques, tome i., p. 423.



*Roman red  
lustrous ware.*

and the finishing completed by the lathe inside and around the edges.\*

Hitherto no evidence has been obtained of the manufacture of this ware in the British islands, though its remains are sufficiently common, especially at the chief Roman stations. It would appear to have been imported during the Roman occupation of these countries, and, judging from the mended specimens, often discovered, to have been of fair value at that time, much as Chinese porcelain was before porcelain was made in this country. The red Roman ware would appear to have been manufactured somewhat extensively in Italy, Germany, and Gaul. Aretium (the modern Arezzo) was famous for its red pottery, and hence this kind is sometimes termed "Aretine ware."† Various instruments in bronze, copper, ivory, or bone have been found where kilns for firing this ware have been discovered. Moulds also, and stamps for making them‡ have, in like manner, been obtained where it was manufactured, as at Rheinzabern, Lezoux, Arezzo, and elsewhere. Though all this ware does not exhibit the potters' marks, a large proportion of it is found carefully stamped with them. They sometimes have the name, followed by F., as, for example, MONTANVS·F, showing that *Montanus* made it; at others, the name in the genitive is followed by M., such as CRISPINI·M, meaning from the hand or shop of *Crispinus*. In others again O, or OF (*officina*), points to the manufactory of some potter named. Some pieces of this ware have, according to Brongniart,

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\* Indeed, if the general mould were whole, and employed as a sagger, the interior vessel, in its paste state, after drying and shrinking, might have been fired in it, thus permitting many moulded pieces to have been fired in the same kilns, moulds being, like saggars, piled on each other, so as to permit the proper heat to circulate among the general collection of pieces to be fired. If, after shrinkage, the pieces of moulded paste have been taken from their general moulds, these being in two or more pieces, they have been well finished after removal, for traces of mould divisions are, at least, very rare.

† Roman red ware is not uncommonly known by antiquarians as "Samian," from Samos having been celebrated for its manufacture of a red pottery. The Samian potters were famous about B.C. 900; but it may be doubted if any vessels there manufactured have ever been found at the Roman stations in England.

‡ A specimen of one of these moulds can be seen in the collection of the red Roman ware at the British Museum, as also one of the separate stamps, likewise of the same ware, by which the moulds were impressed.

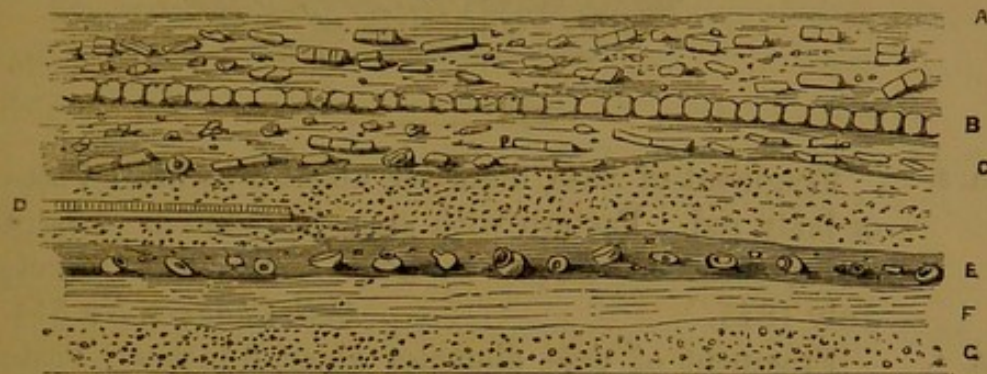


been found with marks engraved with a point after baking, and he observes that though in the Roman potteries found in France, the potters' names are chiefly Latin, there are, nevertheless, some Gaulish names, such as *Divea*, *Vexivia*, *Buturia*, &c.

*Roman red lustrous ware found in London.*

The annexed section (fig. 25) by Mr. Chaffers, shown while the works were in progress in Cannon Street, City, in 1852, will serve to illustrate the manner and relative position in which this ware is usually discovered in London.

Fig. 25.



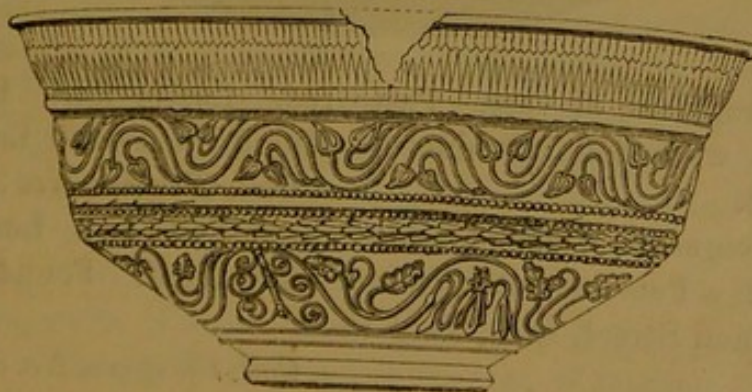
A, present level of the street. B, roadway, previous to the great fire of London, 1666. C, ground in which the Norman and early English pottery is found. D, Roman pavement. E, ground in which the red lustrous and other Roman ware is found. F, clay. G, gravel.

#### ROMAN WARE OF DIFFERENT KINDS FOUND IN ENGLAND.

Large elegantly formed vase, diameter at top  $9\frac{1}{2}$  inches. Paste or body red, with lustrous glaze in good condition. Potter's mark, OF·VITAL. Pattern as in the annexed figure (fig. 26). Found in St. Martin's-le-Grand, August 1845. *Ce. A. 1.*

*Coll. Chaffers, No. 295.*

Fig. 26.



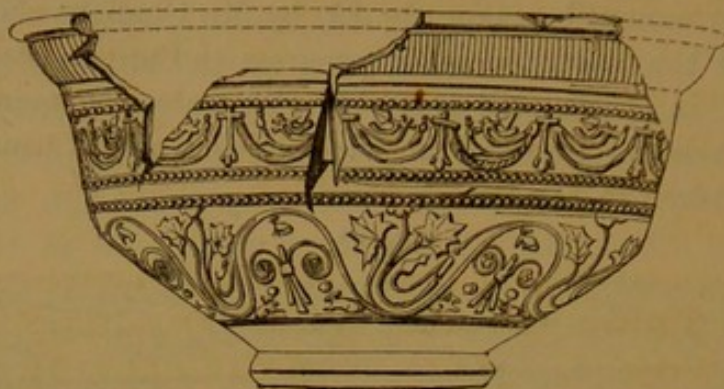


*Roman red lustrous ware found in London.*

Ce. A. 2.

Large fragment of vase, diameter about  $9\frac{1}{2}$  inches. Paste or body red. Lustre in good condition. Potter's mark, OF·RVFINI. Pattern as in annexed figure (fig. 27). Found in London. *Coll. Chaffers, No. 326.*

Fig. 27.



Ce. A. 3.

Fragment of vase, diameter about 9 inches. Paste or body red. Pattern with stags introduced. Lustre well preserved. Found in Love Lane, Tower Street, July 1845. *Coll. Chaffers, No. 344.*

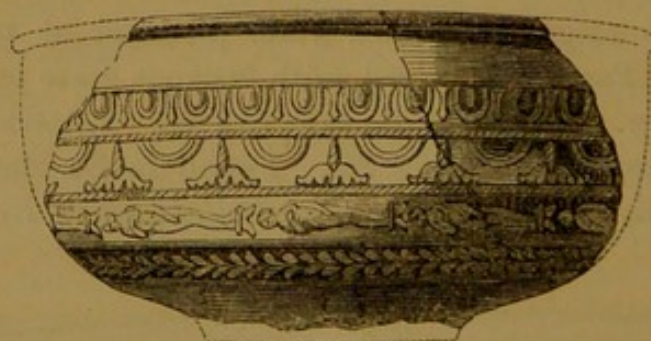
Ce. A. 4.

Fragment of vase, diameter about 8 inches. Paste red. Lustre good. Pattern, with birds introduced. Found in London, 1844. *Coll. Chaffers, No. 324.*

Ce. A. 5.

Fragment of vase, diameter about 8 inches. Paste red. Glaze in part decomposed. Pattern with a range of figures representing the Medicean Venus (fig. 28). Found at St. Mary-at-Hill, July 1845. *Coll. Chaffers, No. 328.*

Fig. 28.



Ce. A. 6.

Fragment of vase. Paste red. Lustre fair. Pattern with lion introduced. Found in Foster Lane, 1844. *Coll. Chaffers, No. 355.*

Ce. A. 7.

Fragment of upright-sided vase. Paste red. Lustre good. Pattern with Victory introduced. Found in Cannon Street, City, July 1848. *Coll. Chaffers, No. 850.*



- Fragment of vase. Paste red. Lustre good. Pattern with Cupid and dog. Found in Philpot Lane, June 1845. *Coll. Chaffers, No. 376.* Ce. A. 8.
- Fragment of upright vase. Paste red. Lustre good. Pattern with birds and dogs introduced. Found in Watling Street, September 1849. *Coll. Chaffers, No. 776.* Ce. A. 9.
- Fragment of vase. Paste red. Lustre good. Pattern with Roman soldiers and tripod. Found in Friday Street, December 1844. *Coll. Chaffers, No. 187.* Ce. A. 10.
- Fragment of upright vase. Paste red. Lustre excellent. Pattern with robed figures. Found in Foster Lane, 1844. *Coll. Chaffers, No. 365.* Ce. A. 11.
- Fragment of vase. Paste red. Lustre good. Pattern, with vine leaves and tendrils, the stems forming a scroll, with birds introduced. Found in Foster Lane, October 1844. *Coll. Chaffers, No. 354.* Ce. A. 12 a.
- Large fragment of vase, diameter about 7 inches. Paste red. Lustre good. Pattern with hare hunted by hounds introduced in the upper compartment, and with birds and leaves in the lower. Found in Lad Lane, 1842. *Coll. Chaffers, No. 322.* Ce. A. 12 b.
- Large fragment of vase, diameter about 6½ inches. Paste red. Lustre good. Pattern with dogs having ruffs on their necks introduced. Potter's mark. Found in Queen Street, Cheapside, June 1850. *Coll. Chaffers, No. 954.* Ce. A. 13.
- Fragment of upright-sided vase. Paste red. Lustre somewhat dull. Pattern with naked figure holding a club. Found at St. Paul's, October 1843. *Coll. Chaffers, No. 216.* Ce. A. 14.
- Fragment of upright-sided vase. Paste red. Lustre good. Shows mending by lead during the Roman occupation of England, in the same manner as earthenware and china now are by metallic wires or bands. Found in Foster Lane, 1844. *Coll. Chaffers, No. 305.* Ce. A. 15.
- Fragment of vase. Paste red. Lustre good. Pattern with dogs and leaves. Shows mending in lead, as in Ce. A. 15. Found in Greenwich Railway Terminus, Southwark, 1841. *Coll. Chaffers, No. 325.* Ce. A. 16.
- Fragment of vase. Paste red. Lustre good. Pattern with goose or duck flying as if coming into Ce. A. 17.



*Roman red  
ware found in  
London.*

water. Shows mending in lead, as Ce. A. 16. Found in Queen Street, Cheapside, 1850.

*Coll. Chaffers, No. 741.*

- Ce. A. 18. Acetabulum, or vinegar cup, nearly perfect, diameter 4 inches. Paste red. Lustre good. Plain, without ornament (fig. 29). Potter's mark. Found in London, 1849.

*Coll. Chaffers, No. 963.*

Fig. 29.



- Ce. A. 19. Large fragment of acetabulum, diameter  $4\frac{1}{2}$  inches. Paste red. Lustre good. Plain. Potter's mark. Found in Nicholas Lane, City, 1850.

*Coll. Chaffers, No. 955.*

- Ce. A. 20. Patera, nearly perfect, diameter 5 inches. Paste red. Lustre good. Plain. Found in Bishopsgate Street, 1844.

*Coll. Chaffers, No. 337.*

- Ce. A. 21. Patera, perfect, diameter 4 inches. Paste red. Lustre good. Plain. Bears marks of having been used over fire. Potter's mark, DECEMI · M. Found in Lad Lane, 1842.

*Coll. Chaffers, No. 327.*

- Ce. A. 22. Fragment of cup, diameter  $3\frac{1}{8}$  inches. Paste red. Lustre good. Form and pattern as in annexed figure (fig. 30). Potter's mark, (fig. 31), refers its manufacture to Aretium (modern Arezzo), having the foot-print that was there so commonly employed with the potter's mark. Found at the Greenwich Railway Terminus, 1841.

*Coll. Chaffers, No. 315.*

Fig. 30.

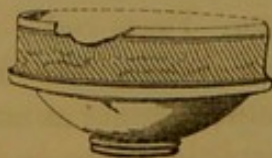


Fig. 31.



- Ce. A. 23. Fragment of patera with handles, diameter  $4\frac{1}{2}$  inches. Plain. Paste red. Lustre good. Found in Lad Lane, 1842.

*Coll. Chaffers, No. 322.*

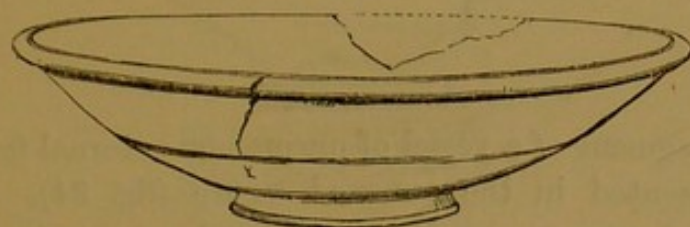
- Ce. A. 23 a. Fragment of patera with handle. Body red. Glaze good. Pattern plain. Potter's mark, OFF · SAB. Found in London.

*Coll. Chaffers, No. 586.*



Bowl, nearly perfect. Form as in annexed figure (fig. 32). Diameter 9 inches. Paste red. Lustre good. Plain. Potter's mark, TITIVS, inside a circle with line pattern. Found in Queen Street, City, 1850. *Ce. A. 24.*  
*Coll. Chaffers, No. 953.*

Fig. 32.



Dish, not quite so perfect, diameter 9 inches. *Ce. A. 25.*  
 Paste red. Lustre good. Plain, with lathe marks.  
 Potter's mark, COSI · RVFIN. Found in London.

*Coll. Chaffers, No. 331.*

Fragment of patera. Paste red. Lustre moderately good. Shows leaf pattern laid on upon the rim, in relief, in slip, after the piece was turned. Found in Philpot Lane in 1845. *Ce. A. 26.*  
*Coll. Chaffers, No. 621.*

Fragment of rim of patera. Body red. Glaze lustrous. Shows leaf pattern laid on in slip, of same body as the patera, as *Ce. A. 26.* Found in Lawrence Pountney Lane, London, August 1846. *Ce. A. 26 a.*

*Coll. Chaffers, No. 361.*

Fragment of small patera, with portion of handles. *Ce. A. 26 b.*  
 Body red. Glaze good. Shows leaf pattern in slip on rim, as in *Ce. A. 26.* and *Ce. A. 26 a.* Found in London.

*Coll. Chaffers, No. 661.*

Fragment of rim of bowl. Body red. Glaze good. *Ce. A. 26 c.*  
 Rim shows that after turning it has been cut in part, and a pattern produced by slip. Found in London.

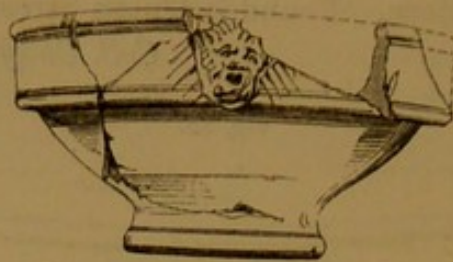
*Coll. Chaffers, No. 667.*

Mortarium, in which substances were ground for domestic use. Up to a certain height inside it was lined with grains of hard stone, forced into the paste or body after the piece was fashioned. Grains composed of pounded rock, with a few of quartz. Paste red. Lustre good. External form as in the annexed figure (fig. 33), showing a mask, through the mouth of which the substances, after pounding or grinding, were poured, probably mixed with some liquid. Potter's *Ce. A. 27.*



*Roman red ware* name on the side of the mask, VLIIGI · M. Found  
*found in* in London. *Coll. Chaffers, No. 380.*  
*London.*

Fig. 33.



Ce. A. 28. Fragment of a vessel of uncommon external form, as  
 represented in the annexed figure (fig. 34). Paste  
 red. Lustre good. Found in London.

*Coll. Chaffers, No. 631.*

Fig. 34.



Ce. A. 29 to Ce. A. 35. Fragments of the Roman red lustrous ware, showing  
 potter's marks, among which are the following :—

Ce. A. 29. Fragment. Potter's mark, OF · MONT · °K. Found  
 in Cannon Street, 1848. *Coll. Chaffers, No. 844.*

Ce. A. 30. Bottom of a cup. Potter's mark, RI · IOGENI.  
 Found in London. *Coll. Chaffers, No. 627.*

Ce. A. 31. Fragment. Potter's mark, MICCIO. (Fig. 35.)  
 Found in Creed Lane, London. *Coll. Chaffers, No. 516.*

Fig. 35.

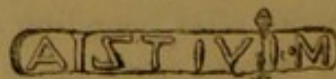


Ce. A. 32. Fragment. Potter's mark, ROPVSI · FF. Found in  
 Queen Street, City. *Coll. Chaffers, No. 545.*

Ce. A. 33. Fragment. Potter's mark, PRIMVL. Found in  
 Cannon Street, City, 1848. *Coll. Chaffers, No. 845.*

Ce. A. 34. Fragment. Potter's mark, AISTIVI · M. Found in  
 Creed Lane, London. *Coll. Chaffers, No. 533.*

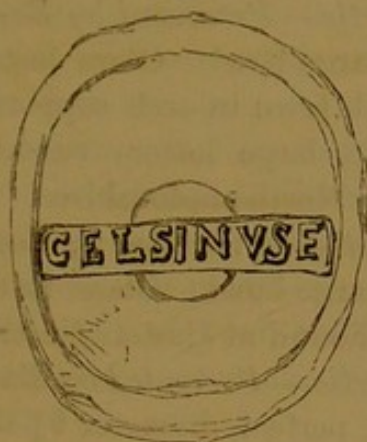
Fig. 36





Flat plain catinus. Potter's mark, CELSINVS · F. Ce. A. 35.  
 (Fig. 37.) Found in Staining Lane, London, 1845.  
*Coll. Chaffers, No. 308.*

Fig. 37.



Large fragment of upright-sided vase. Lustre in part dull and decomposed. Pattern as on the annexed figure (fig 38). Diameter 8 inches. Shows the manner in which, as in Ce. A. 15, a crack has been united in two places by means of lead rivets in the time of the Roman occupation of England. Found at Castor (the ancient Durobrivæ), near Peterborough, Northamptonshire. *Coll. Artis.—Presented by Earl Fitzwilliam.* Ce. A. 36.  
*Roman pottery found at Castor, Northamptonshire.*

Fig. 38.



Large fragment of a bowl. Lustre in part decomposed. Pattern as in annexed figure (fig. 39). Diameter about 6 inches. Shows ancient lead rivetting. Found at Castor, Northamptonshire. Ce. A. 37.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 39.





*Roman pottery  
found at Castor,  
Northampton.*

- Ce. A. 38. Fragment of a bowl. Glaze in part decomposed. Pattern with naked figure playing on a lyre. Exhibits mending by lead rivets in two places. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 39. Fragment of large bowl. Glaze lustrous. Pattern female figure with fawn in arch supported by tripods. Potter's mark in large letters outside **MV932**. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 40. Fragment of large bowl. Glaze lustrous. Pattern elegant scroll. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 41. Shallow bowl, perfect, diameter  $9\frac{3}{4}$  inches. Glaze in good condition inside; outside decomposed. Potter's mark CRISPINI, within a rayed circle. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 42. Fragment of a bowl. Pattern contains a female figure with helmet, shield, and spear, perhaps representing Minerva; also figure of a boar. Has been mended in two places with lead rivets. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 43. Fragment of a bowl. Glaze good. Shows mending by a lead rivet. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 44. Fragment of somewhat large mortarium. Glaze good. Plain. Grains of quartz inserted in the part for rubbing down or grinding substances. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 45—48. Bottoms of bowls and cups, exhibiting potters marks. Ce. A. 45, VINIINO·M;—Ce. A. 46, AIISTVI·M, a circle passing amid the lettering;—Ce. A. 47, ADIECTI·M, with a small circle passing amid the letters;—Ce. A. 48, LVIIIV·M, inside a circle. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 49—51. Fragments of portions of bowls, with different patterns.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 52. Bowl restored, by Professor I. S. Henslow, from numerous fragments, parts supplied with plaster of



Paris ; diameter 9 inches. Glaze very hard. Has been repaired with lead rivets in several places, during the Roman occupation of the country, as at R. Found at Colchester. *Roman pottery found at Colchester.*  
*Presented by Professor I. S. Henslow.*

Fragments of bowls. Found at Colchester.

Large fragment of a mortarium, diameter 6 inches. Plain. Grains of quartz inserted into the paste in the interior, for a rubbing surface, apparently after that surface was turned on a lathe. Found at Colchester. *Ce. A. 53—60.  
C. A. 61.*

Part of a larger mortarium, with a lion's head on the external part, the open mouth serving for a passage through which the pounded or bruised matters were poured out, suspended in some liquid. Found at Colchester, 1850. *Ce. A. 62.*

Fragment of bowl, apparently an ancient fragment, united to a broken bowl by three rivets of lead. Lathe marks on the exterior show that the bowl was turned in the upper part after removal from the general mould, giving the pattern. Found at Colchester. *Ce. A. 63.*

Bottom of a bowl, with potter's mark, ALBVCI · M. Found at Colchester. *Ce. A. 64.*

Fragment of an upright-sided bowl, with a part of the pattern of the kind, though smaller, seen on the upright-sided bowl (Ce. A. 36) found at Castor, Northamptonshire, namely, the figure of a naked man, whose lower limbs terminate in serpents. Found at Colchester. *Ce. A. 65.*

Small fragment of a bowl, with a rabbit or hare forming part of the pattern. Found at Colchester. *Ce. A. 66.*

Small fragment, with the figure of a lion. Found at Colchester. *Ce. A. 67.*

Model of a Roman kiln for firing pottery, found at Normanton Field, Castor, near Peterborough, the ancient Durobrivæ of Antoninus, according to Mr. E. T. Artis. The accompanying (fig. 40.) is a reduction of the representation of this kiln given by that antiquary. (The Durobrivæ of Antoninus Illustrated, pl. xl. fig. 3, where its small dimensions may be seen.) It was discovered in 1822, and vessels and fragments of pottery were found in connexion with this and another kiln mentioned beneath, many of which are in this collection. *Ce. A. 68.  
Roman pottery kiln found at Castor.*

*Coll. Artis.—Presented by Earl Fitzwilliam.*



Fig. 40.

*Roman pottery  
kiln found at  
Castor, North-  
amptonshire.*

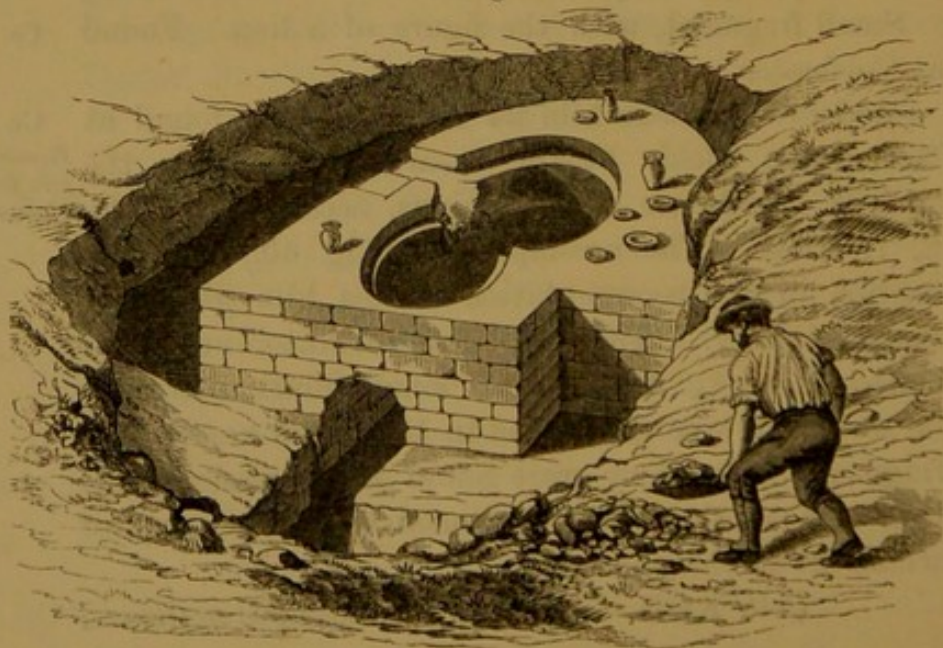


Ce. A. 69.

Model of another Roman pottery kiln, found at Normanton Field, Castor, also in December 1822, from which vessels were obtained. Figured by Mr. Artis, who discovered it, in his *Durobrivæ of Antoninus Illustrated*, pl. xl. fig. 1. This kiln also was of small size, as will be seen from the annexed reduction of Mr. Artis's representation (fig. 41). Both these models (Ce. A. 68 and 69,) were constructed by Mr. Artis. In the work above mentioned, pl. xxxix., a plan of the ground occupied by the Roman Pottery will be seen, showing the site of the pottery, and the course of a Roman road.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 41.





Bone or ivory tools, found on the site of the Roman pottery at Castor, in 1822 and 1823, by Mr. Artis. Figured by him in his *Durobrivæ of Antoninus* Illustrated, pl. xlii.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Bronze tools, found on the site of the Roman pottery at Castor, with the above, by Mr. Artis, and in part figured by him in his work above mentioned.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

A bronze instrument from the collection made at Castor, the use of which is not clear, but which may have been employed at the pottery.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Shaped bone from Castor, apparently as if intended to smooth some soft substance, like pottery clay, a handle being inserted into the central hole.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Large fragment of a cake of a glass or frit (fig. 42), found on the site of the Roman pottery, Castor. Probably such as was there used for glazing the pottery. Composition according to the analysis made at the Museum of Practical Geology.

*Fragment of glass or frit, to be used for glaze, found at Castor.*

Silica	-	-	-	69·40
Alumina	-	-	-	2·62
Protoxide iron	-	-	-	·91
Protoxide manganese	-	-	-	·64
Magnesia	-	-	-	·79
Lime	-	-	-	7·81
Potash	-	-	-	·98
Soda	-	-	-	14·63
Carbonic Acid	-	-	-	·32

It is thus essentially a glass composed of the silicates of soda and lime. An interesting circumstance connected with much of the ancient Roman glass, which is of similar composition. See specimens from Naples, in the Museum.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 42.





*Cake of iron  
found at the  
Roman pottery,  
at Castor.*

Ce. A. 84.

Cake of iron, rudely cast in the bottom of a crucible or mould. Found on the site of the Roman pottery at Castor. The iron, when oxidised, and mingled with the other ingredients of the glaze, considered to give the red colour to those glazes which have not been so highly fired as to destroy that colour.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 85.  
*Roman pottery  
found at Castor.*

Large fragment of a bowl. Paste dark coloured in the interior, where thickest, and least fired throughout; more red on the external part. Glaze, containing peroxide of iron, laid on by dipping, or by the brush. Bowl turned in a lathe before firing, glaze enters into all the cavities of the lathe marks. Found at Castor, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 86.

Small vase, nearly complete, of the same pottery, with the same kind of glaze. Form as in the annexed sketch (fig. 43). Found at the site of the Roman pottery, Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 43.



Ce. A. 87.

Small cup or vase. Paste or body fired yellowish brown. Covered with a dull red glaze, not well vitrified. Represented in Artis's *Durobrivæ*, pl. xlvii., fig. 2. Found on the site of the Roman pottery, Castor, in 1826.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 88.

Lamp of the same kind of pottery, with similar glaze, latter much injured. Represented in Artis's *Durobrivæ*, pl. xlvii. fig. 3. Found on the site of the Roman pottery at Castor, in 1826.

*Coll. Artis.—Presented by Earl Fitzwilliam.*



Fragment of similar pottery, found in the same <sup>Various localities.</sup> locality. Body yellowish brown. Glaze or covering red and earthy, not well vitrified. Ce. A. 89.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Large portion of small lamp, similar kind of pottery, covered with red glaze. Found in London. Ce. A. 90.

*Coll. Chaffers.*

Fragment of whitish pottery, covered with red glaze, better fired outside than inside. Outside ornamented with a pattern in white pipe clay engobe. Found at Castor. Ce. A. 91.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of yellowish brown paste, covered with red glaze, somewhat highly fired, so as to assume a brown tint. Outside ornamented by indentation with the tool. Found at Castor. Ce. A. 92.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of a mortarium, of a pottery somewhat similar to Ce. A. 85. Less fired portion in the interior of the paste dark coloured; exterior portions red. Glaze dull and red. Grains of quartz for the rubbing surface of the mortarium. Found at Colchester. Ce. A. 93.

*Presented by Prof. Henslow.*

Portion of a small cup, ribbed outside. Paste reddish yellow. Glaze brownish, apparently the red somewhat highly fired. Found at the Roman pottery, Castor. Ce. A. 94.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Portion of a baked clay similar to that forming the paste of Ce. A. 94, with imprints of workman's fingers. Found at the same Roman pottery, Castor. Ce. A. 95.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of vase. Body yellowish red, with a figure of a dog and scroll pattern in relief in engobe. The figures and other parts in relief apparently added after the vase was formed. Glaze lustrous, metalloid appearance. Found at Castor, Northamptonshire. Ce. A. 96.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Perhaps part of the same vase as Ce. A. 96. Ce. A. 96 a.

Smaller fragment of the same pottery. Paste or body white. Glaze with somewhat metalloid lustre. Same both inside and outside. Pattern as in annexed sketched (fig. 44). Found at Castor. Ce. A. 97.

*Coll. Artis.—Presented by Earl Fitzwilliam.*



*Roman pottery  
found at Castor.*

Fig. 44.



Ce. A. 98. Fragment of pottery manufactured in the same manner, the paste being, however, yellow red, similar to Ce. A. 94. Glaze with metalloid lustre. Pattern as annexed (fig. 45). Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 45.



Ce. A. 99—101. Fragments of similar pottery. Body or paste as in Ce. A. 98. Glaze the same inside and outside. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 102, 103. Small fragments of similar pottery, well showing the method of adding the dots for a band of fruit or flowers, by dabbing prepared clay on the surface of the vase, after turning. Found at Castor.

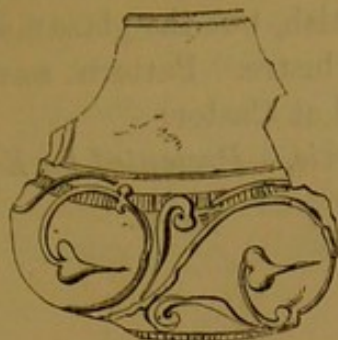
*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 104. Fragment of similar pottery. Pattern as in annexed sketch (fig. 46), and seen to pass over the prior indentations by the tool made on the surface of the vase, after turning on the lathe, the marks of which can be traced. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*



Fig. 46.



Fragment of the same pottery. Glaze apparently very highly fired. Pattern elegant scroll. Found at Castor. Ce. A. 106.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of similar pottery. Glaze unequally fired. Pattern elegant scroll, and in part crazed. Found at Castor. Ce. A. 107.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of smaller vase, same pottery. Glaze lustrous. Pattern, scroll. Found at Castor. Ce. A. 108.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Small fragment of similar pottery. Pattern not common. Found at Castor. Ce. A. 109.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of pottery of the same kind of manufacture and glaze. Paste more white. Pattern rude naked figure of a man, with a belt round his loins. Found at Water Newton, Northamptonshire, November 1827. Figured by Artis in his *Durobrivæ*, pl. xxx. fig. 4. Ce. A. 110.

*Coll. Artis.—Presented by Earl Fitzwilliam.* Ce. A. 111.

Fragment of same kind of pottery as the last. Part of the pattern a hare in relief (fig. 47). Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 47.





*Roman pottery  
found at Castor.*  
Ce. A. 112.

Part of vase, of same general character of manufacture. Paste whitish, but the glaze more red, and with little metalloïd lustre. Pattern scroll, as annexed (fig. 48). Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 48.

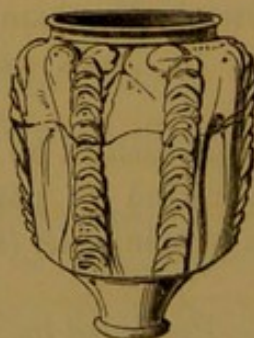


Ce. A. 113.

Vase, 6 inches high. Paste of the reddish yellow kind, mentioned as that of part of the preceding description of pottery. Glaze also somewhat similar, with metalloïd lustre in part. Pattern, somewhat peculiar, and as in annexed sketch (fig. 49.) Ribbed corners apparently made by overlapping cut pieces of the clay, before glazing. Represented in Artis's *Durobrivæ*, pl. iii. fig. 1. Found in the Roman pottery kiln, Normangate Field, Castor, December 25, 1822.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 49.



Ce. A. 114.

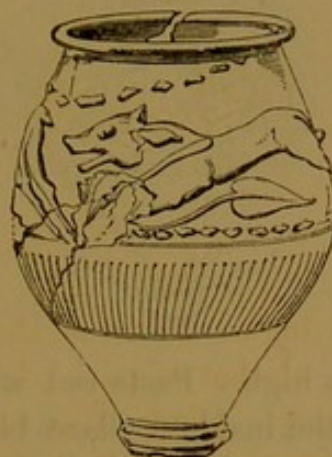
Large portion of a vase, 6½ inches high. Paste yellowish brown, same as that often mentioned from Castor. Glaze preserving the colour of the paste, except at the bottom, where darker colour is seen, tinted, perhaps, before glazing. Pattern three lines of tool work, and eight large indentations on the widest circumference. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*



Vase,  $4\frac{1}{2}$  inches high. Paste white. Glaze dark, with a metalloid lustre, similar in general character to those mentioned above. Pattern also similar, as in annexed sketch (fig. 50), including hounds hunting a stag; this part laid on in slip of the paste after the vase was turned; tool work at the bottom. Cateaton Street, London, January 1845. *Coll. Chaffers*, 234. *Roman pottery found at Castor and in London.* Ce. A. 115.

Fig. 50.



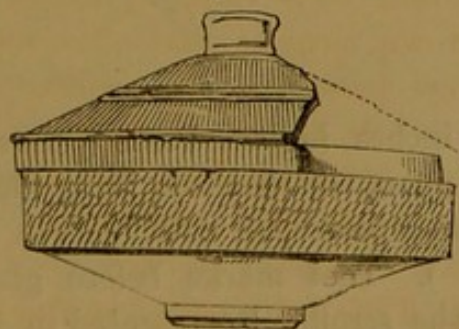
Fragment of a bowl. Paste yellowish and brown. Red glaze not well vitrified, though possessing somewhat of the metalloid lustre inside. Pattern produced by impressions with a tool. Found at Castor. Ce. A. 116.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Vessel with a top, diameter  $6\frac{1}{2}$  inches, height 5 inches. Paste yellowish, white where most fired, darker tint where least so. Glaze red, imperfectly and unequally fused. Pattern produced partly by turning on a lathe, partly by impressions with a tool, as in annexed sketch (fig. 51). Represented in *Artis's Durobrivæ*, pl. xlix. fig 4. Found in a Roman building, Sutton-field, near Castor. Ce. A. 117.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 51.



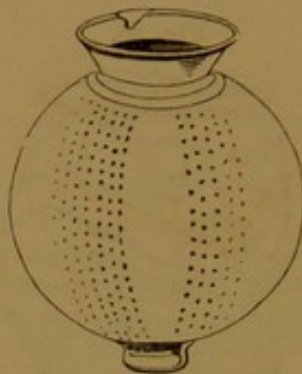


*Roman pottery  
found in London  
and at Castor.*

Ce. A. 118.

Vase  $4\frac{1}{2}$  inches high. Paste reddish where most fused, darker coloured inwards. Glaze black. Patterns in dots, as shown in the annexed sketch (fig. 52), upon a plain surface, turned; the dots probably laid on in the manner of stencilling. Found in Queen Street, Cheapside, June 1850. *Coll. Chaffers, No. 958.*

Fig. 52.



Ce. A. 119.

Vase,  $5\frac{3}{4}$  inches high. Paste red where most fused, darker colour in the inside. Glaze black, the red tint of the paste somewhat apparent through the glaze. Pattern produced by tool marks in bands, after turning on the lathe, the sides then depressed in seven compartments, as in annexed sketch (fig. 53). Found in Lothbury, London, 1847. *Coll. Chaffers, No. 173.*

Fig. 53.



Ce. A. 120.

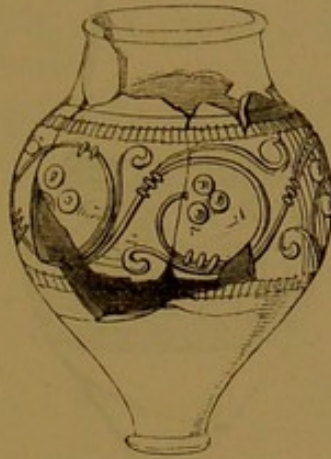
Vase,  $5\frac{1}{4}$  inches high. Paste yellowish brown. Glaze black, upon which there is an elegant engobe scroll in white pipe clay. Pattern as in the annexed sketch (fig. ). Tool marks before glazing, above and beneath the scroll. Represented in Artis's Duro-



brivæ, pl. xli., fig. 1. Found, February 1826, in a Roman pottery found at Castor and Winchester. Roman building, near Water Newton, Northamptonshire.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 54.



Two fragments of a vase. Paste yellowish brown. Ce. A. 121. Glaze black, upon which there is an engobe pattern in white pipe clay. Tool bands as in Ce. A. 120. These pieces apparently arranged as one to show pattern in Artis's Durobrivæ, pl. iii. fig. 2. Found in a potter's kiln, Normangate Field, Castor, December 25, 1822.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 55.



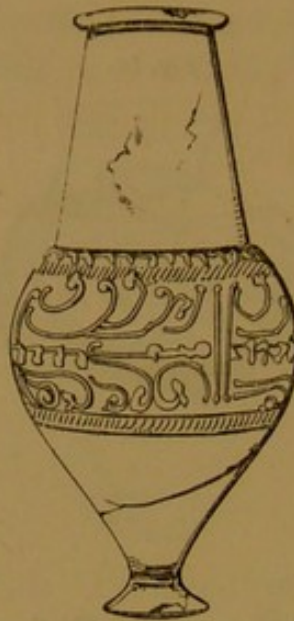
Vase, 8 inches high. Paste yellowish brown, similar Ce. A. 122. to much found at Castor, and there apparently manufactured. Glaze, in largest and upper portion, black, with slip in white pipe clay; two bands of tool marks made before glazing. Stem of vase, glaze red.



*Roman pottery  
found at Win-  
chester and  
Castor.*

Shape and pattern as in annexed figure (fig. 56).  
Found at Winchester. *Coll. Chaffers, No. 707.*

Fig. 56.



*Ce. A. 123.  
Roman pottery  
found at  
Colchester.*

Vase, 6 inches high. Paste yellowish brown, as in the preceding. Glaze black, upon larger and upper portion; on the stem, red. Pattern, tool marks in bands, without slip, otherwise, in shape and general character, much resembling Ce. A. 122. Found at Colchester, 1851.

*Ce. A. 124.* Fragment of a vase. Paste white. Glaze black, with pattern in engobe of yellowish white. Found at Colchester.

*Ce. A. 125.* Fragment of pottery. Paste white. Glaze red, with angular pattern in white engobe, the latter apparently laid on before firing, inasmuch as at the spaces which have been covered by the engobe, and which has fallen off, the glaze is more red, from being less exposed to the heat, than in other places, where the original red glaze is blackened from the alteration in the oxide of iron. Found at Colchester.

*Ce. A. 126.* Fragment of pottery. Paste yellowish brown. Glaze red, with white engobe of pipe clay on the glaze. Found at Colchester.

*Ce. A. 127.* Fragment of pottery. Body or paste white. Glaze red inside, black outside, the latter probably only a

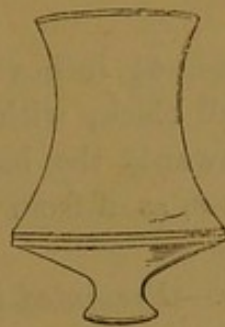


higher fired condition of the other. Lustre somewhat metalloid. Part of an engobe scroll on the glaze in white pipe clay. Found at Colchester. *Roman pottery found at Colchester and Castor.*

Vase,  $3\frac{1}{4}$  inches high. Body white. Glaze red ; where most fired dark coloured. Represented by Artis in his *Durobrivæ Illustrated*, pl. liv., fig. 1. Found, 25th December 1822, in a Roman potter's kiln, Normangate Field, Castor. Ce. A. 128.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 57.



Bottle-formed vessel,  $6\frac{1}{2}$  inches high. Body white. Glaze or covering dull and black where most fired, somewhat blackish brown elsewhere. Pattern, bands in tool marks. Found on the site of the Roman pottery, Normangate Field, Castor. Ce. A. 129.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragment of a bowl. Body dark coloured inside, white where most fired externally, pointing to the dark colour being due to carbonaceous matter. Glaze black. Found at Colchester. Ce. A. 130.

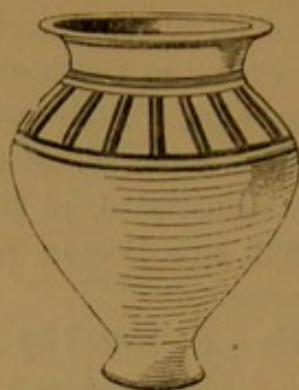
Vase,  $6\frac{1}{2}$  inches high. Body dark coloured, as if from a carbonaceous clay, not highly fired. Pattern partly produced by glossy lines upon a dull ground, as from the smoothing pressure by a tool, partly by bands from turning in a lathe. Form and pattern as in annexed figure (fig. 58). Represented in Artis's *Durobrivæ Illustrated*, pl. li., fig. 2. Found, February 1826, in a Roman building, at Water Newton, Northamptonshire. Ce. A. 131.

*Coll. Artis.—Presented by Earl Fitzwilliam.*



*Roman pottery  
found at Castor  
and Colchester.*

Fig. 58.



Ce. A. 131 *b*. Fragment. White grey body. Pattern produced by glossy crossing straight lines, as in the preceding. Ring also glossy, from the same method. Found at Colchester.

Ce. A. 132. Fragment of vase,  $4\frac{1}{2}$  inches high. Body white. Glaze or coating dull black, with somewhat metalloid lustre inside, and towards the base outside. Pattern, in raised crossed lines, as if from pressure in a mould. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 133. Large part of a vase, 5 inches high. Body white. Outer coating dull grey. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 134. Fragment of a vessel of the same kind as Ce. A. 117, but of larger dimensions, its curve giving a diameter of about  $12\frac{1}{2}$  inches. Body white. Glaze red in the interior, dark coloured outside where more fired. Found at Castor. *Coll. Artis.—Presented by Earl Fitzwilliam.*

Ce. A. 135—  
137. Ungentaria. Body brown, coating dull blackish brown. Forms as shown in accompanying figures (figs. 59 & 60). Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 59.

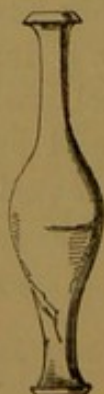
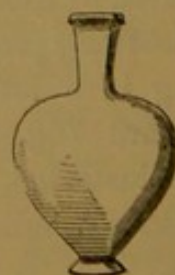


Fig. 60.





Ungentarium. Paste red. Glaze brownish black. *Roman pottery found at Castor.*  
Found at Castor. Ce. A. 138.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Ungentarium. Body yellowish brown. Glaze red Ce. A. 139.  
Form as in annexed sketch (fig. 61). Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 61.



Shallow bowl,  $6\frac{3}{4}$  inches in diameter. Body grey Ce. A. 140.  
white. Glaze dark, with metallic lustre from admixture of pounded mica. Bottom cracked in the firing, and probably a piece cast aside. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragments, apparently of bowls. Bodies black to Ce. A. 141,  
grey white, arising from the different amount of firing 143.  
given to the original carbonaceous clay. Patterns produced by tool impressions. In Ce. A. 141 and 142, compasses are seen to have been employed for this purpose. Part of a bowl similar to Ce. A. 143 is represented by Artis in his *Durobrivæ Illustrated*, pl. xlv., fig. 2. Found at the Roman pottery, Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Part of a bowl-formed vessel. Body grey white; Ce. A. 144.  
from the same clay, probably, as the preceding. Dull ash coloured exterior. Pattern indented by tool marks.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Heads of jugs. Body of the same kind as the pre- Ce. A. 145,  
ceding. This form appears to have been somewhat 146.  
common at the Castor pottery, many examples having been discovered. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fragments of somewhat similar ware, though probably from a different clay. Pattern, tool-mark indentations. Found at Colchester. Ce. A. 147,  
148.



*Roman pottery  
found at Castor  
and in London.*  
Ce. A. 149.

Lamp. Body, yellowish brown. Glaze, black (fig. 62).  
Found in Queen Street, Cheapside, 1842.

*Coll. Chaffers, No. 255.*

Fig. 62.



Ce. A. 150. Lamp. Body yellowish brown. Glaze nearly removed by decomposition; the portions remaining, black, as in the preceding. Shape as in annexed sketch (fig. 63). Found in Lad Lane, London, 1842.

*Coll. Chaffers, No. 237.*

Fig. 63.

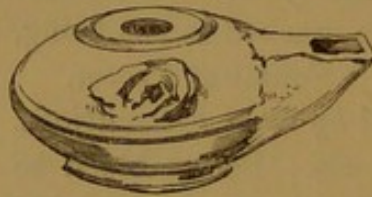


Fig. 64.



Ce. A. 151. Lamp for fixing on a point. Body red, painted in part black. Glaze transparent, apparently, over the whole. Different pottery from Ce. A. 149, 150. Form as in subjoined figure (fig. 64). Found in Queen Street, Cheapside, London, 1842. *Coll. Chaffers, No. 249.*

Ce. A. 152. Lamp. Body, light brown, coated with red covering much decomposed. Upper part, wreath of laurel. Found in London. *Coll. Chaffers.*

Ce. A. 153, 154. Fragments, Ce. A. 153, apparently part of a vase, with indentations of the sides. Body, red where most fired; dark inside. Upon the body, pounded fragments of pottery (apparently) scattered before glazing. Glaze dark coloured. Found at Colchester.

*Presented by the Rev A. C. Henslow.*

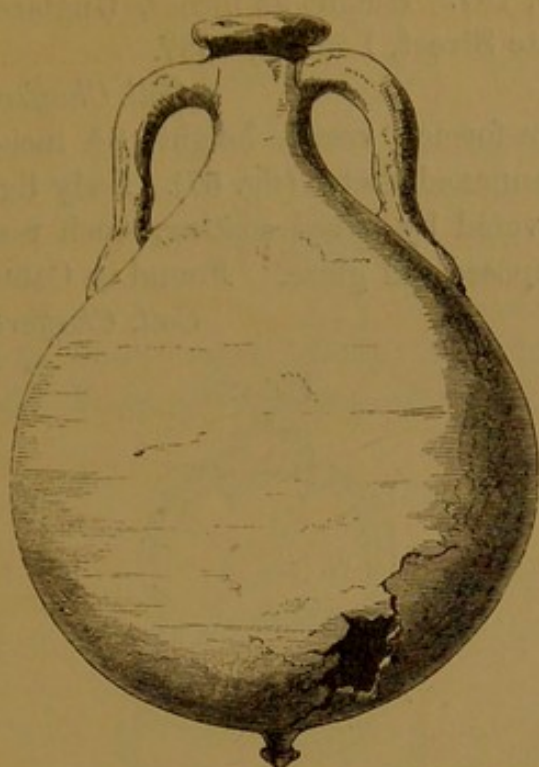
Ce. A. 155. Large amphora, height 2 feet 9 inches, largest diameter 2 feet. Body light brown, though not fine, well worked, like many Roman tiles. Unglazed. Form as in annexed sketch (fig. 65). Found at Aldermanbury, London. *Coll. Chaffers, No. 989.*

*Roman pottery  
found in  
London.*



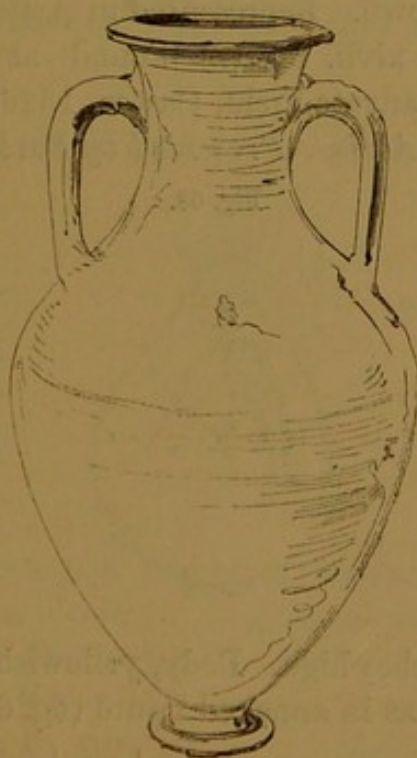
Fig. 65.

*Roman pottery  
found in  
London.*



Smaller amphora of similar pottery, height 17 inches. Ce. A. 156.  
Unglazed. Form as in the annexed figure (fig. 66).  
Found in digging the foundation of London Bridge.  
*Coll. Chaffers, No. 135.*

Fig. 66.





*Roman pottery  
found in  
London.*

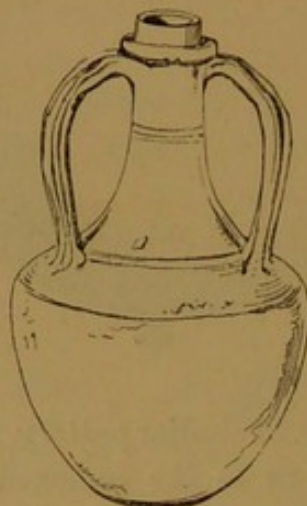
Ce. A. 156, 157. Small amphora. Body light brown, and finer than Ce. A. 156, 157. Height  $9\frac{1}{2}$  inches. Unglazed. Found in Moorgate Street, London, 1837.

*Coll. Chaffers, No. 711.*

Ce. A. 158. Amphora-formed vessel, height,  $8\frac{3}{4}$  inches. Form as in the annexed sketch (fig. 67). Body light reddish brown, covered by a red coating, much resembling a dull decomposed red glaze. Found in Cannon Street, London.

*Coll. Chaffers, No. 718.*

Fig. 67.



Ce. A. 159. Vessel of the form represented in the annexed sketch (fig. 68), height  $6\frac{3}{4}$  inches. Body of a yellowish white, with an exterior more yellow, painted with black in the manner shown. Represented in Artis's *Durobrivæ Illustrated*, pl. xlvii. fig. 1. Found at the Roman pottery, Normangate Field, Castor, 1826.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 68.



Ce. A. 160. Vase,  $4\frac{3}{8}$  inches high. Body, yellowish brown. Unglazed. Form as in annexed figure (fig. 69). Found in London.

*Coll. Chaffers, No. 770.*



Fig. 69.



*Roman pottery  
found at Castor  
and in London,*

Vase,  $3\frac{1}{2}$  inches high. Body, light brownish red. Ce. A. 161.  
Unglazed. Form as annexed (fig. 70.) Found in  
London.

*Coll. Chaffers, No. 190.*

Fig. 70.



Vessel of the form shown in the annexed figure (fig. 71). Body light brown. Unglazed. Represented in Artis's *Durobrivæ Illustrated*, pl. liv., fig. 2. Found in a Roman potter's kiln, Normangate Field, Castor, December 25, 1822. Ce. A. 162.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

Fig. 71.



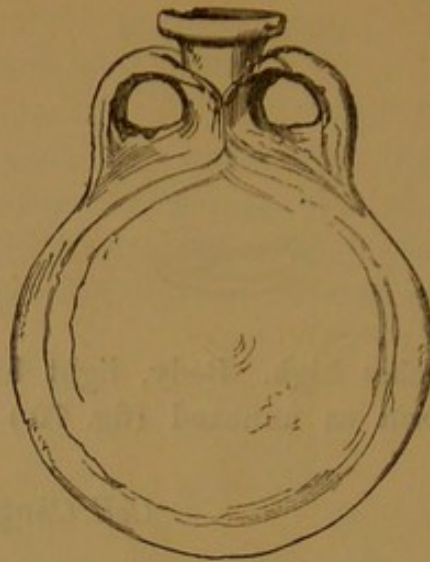
Small flattened amphora,  $7\frac{1}{2}$  inches high. Body, dull reddish brown. Unglazed, with red markings round the flattened sides, as in the annexed figure (fig. 72). Found in Moorgate Street, London, 1835. Ce. A. 163.

*Coll. Chaffers, No. 713.*



*Roman pottery  
found at Castor,  
in London, and  
at Colchester.*

Fig. 72.



- Ce. A. 164. Small vase, 3 inches high. Body, grey. Unglazed. Outside yellowish and blackish. Found at Castor.

*Coll. Artis.—Presented by Earl Fitzwilliam.*

- Ce. A. 165. Fragment. Body white outside, where most fired, grey inside. Pattern with tool-mark impressions. Found at Colchester.

- Ce. A. 166. Small vase, 3 inches in height. Body yellow and earthy. Unglazed. Found at Colchester, 1851.

- Ce. A. 167. Roman terra cotta toy. Body reddish brown. Boy on horseback, as shown in the accompanying sketch (fig. 73). Found in the Borough, 1840.

*Coll. Chaffers, No. 715.*

Fig. 73.



- Ce. A. 168. Similar kind of terra cotta, representing a boy partly clothed. Found in London. *Coll. Chaffers, No. 772.*



Fig. 74.

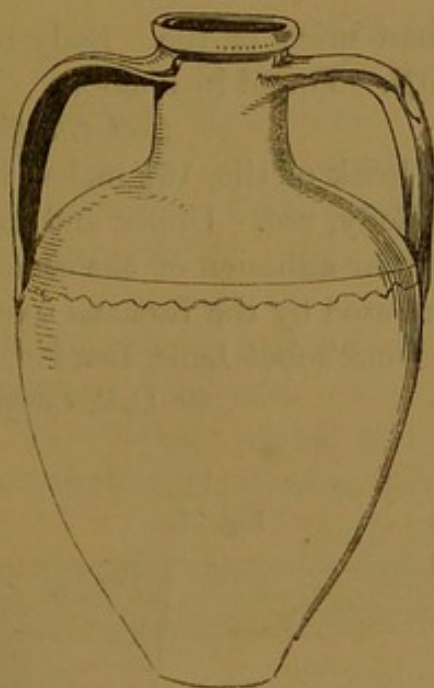


*Roman pottery  
found in  
London.*

Terra cotta head of a similar kind. Armed female head (Minerva?), with part of a shield and of a spear. Found in Lad Lane, London. *Ce. A. 168b.*  
*Coll. Chaffers, No. 250.*

Amphora, height  $16\frac{3}{4}$  inches. Body red. Unglazed. Worked with a zig-zag and a plain band at the height of the base of the handles. Form as in annexed figure (fig. 75). Found in Old Broad Street, London, August 1850. *Ce. A. 169.*  
*Coll. Chaffers, No. 962.*

Fig. 75.



Vase,  $7\frac{1}{4}$  inches in height. Body, grey, rendered coarse by numerous fragments of flints, made white by the firing of the vase. Unglazed. Found in Wells Street, Cripplegate, London, June 1846. *Ce. A. 170.*

*Coll. Chaffers, No. 129.*



*Roman pottery  
found in  
London.*

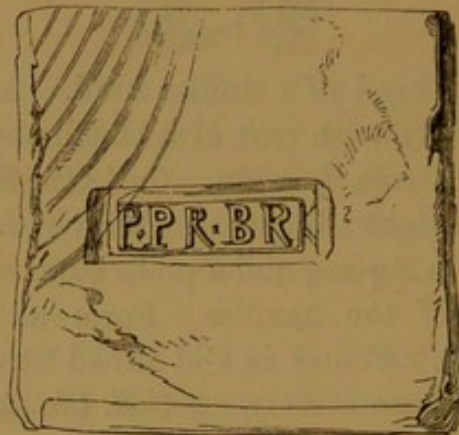
Ce. A. 171. Vase,  $7\frac{3}{4}$  inches in height. Body, dark grey. A kind of glazing produced by pressure or smoothing of parts of the surface. Vertical lines in the lower portion. Found in Kent Street, Southwark, 1847.

*Coll. Chaffers, No. 705.*

Ce. A. 172. Roman brick or tile, square, with  $7\frac{3}{4}$  inches sides. Body red. General appearance as in annexed sketch (fig. 76). Inscribed P. PR. BR. Found in Queen Street, City, London, March 1850.

*Coll. Chaffers, No. 745.*

Fig. 76.



Ce. A. 173. Part of Roman brick or tile. Body red. Inscription P. BR. LON. Found in London.

*Coll. Chaffers, No. 854.*

Ce. A. 174. Hollow flue brick or tile,  $16\frac{1}{2}$  inches long,  $6\frac{1}{2}$  high, and  $4\frac{1}{2}$  deep. Body, red. Upper and lower parts of the brick scored for adhesion of the cement or mortar. These tiles were used by the Romans to convey heated air. Found in Duck's-foot Lane, London, August 1846.

*Coll. Chaffers, No. 117.*

Fig. 77.

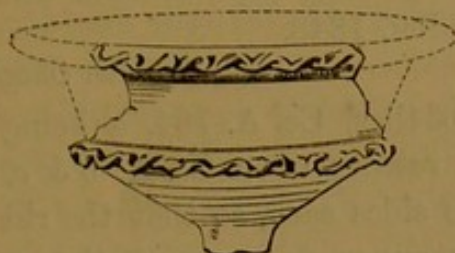


Ce. A. 175. Large fragment of vase. Body light brown, somewhat coarse. Unglazed. Pattern with tool marks, as



in annexed figure (fig. 78). Found in St. Martin's-le-Grand, October 1845. *Coll. Chaffers, No. 167.* *Roman pottery found in London and at Colchester.*

Fig. 78.



Small fragment of pottery. Body light brown. Unglazed. Pattern from tool marks. Found at Colchester. Ce. A. 176.

Fragment of pottery. Body white. Stained outside with red. Pattern from tool marks. Found at Colchester. Ce. A. 177.

Fragment of pottery. Body brownish red, coarse. Unglazed. Pattern from tool marks. Found at Colchester. Ce. A. 178.

Part of a vase. Body reddish brown. Unglazed. Pattern from tool marks. Found in London. Ce. A. 179.

*Coll. Chaffers, No. 178.*

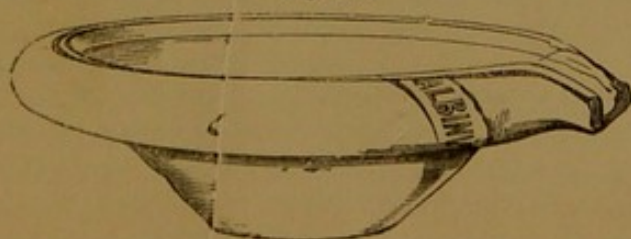
Fragment of a cup. Body light brown. Unglazed. Found at Holt Forest, Hampshire. Ce. A. 180.

Fragment of a cup. Body, blackish brown, highly fired. Glaze, lustrous. Pattern partly from turning, partly from tool marks. Found at Holt Forest, Hampshire. Ce. A. 181.

Mortarium, diameter  $10\frac{3}{4}$  inches. Body light brown, somewhat coarse. Unglazed. Form as in annexed figure (fig. 79). Potter's mark ALBINVS. Found in Cock Lane, Smithfield, London, April 1844. Ce. A. 182.

*Coll. Chaffers, No. 119.*

Fig. 79.





- Ce. A. 183. Roman drain or water-pipe Length, 24 inches. Diameter, inside,  $1\frac{1}{2}$  inches. One of a series, in which one pipe was joined to another, by the insertion of a small portion of its end. In this specimen the fragment of an adjoining pipe is seen cemented to it. Found it London, 1848.

*Coll. Chaffers, No.*

- Ce. A. 184,  
a, b, & c. Roman roof-tiles, Ce. A. 184. a being the *imbrex* or ridge-tile, resting upon Ce. A. b & c, *tegulae*, flat tiles with two sides each, so that the ridge-tile covers them in a manner to prevent the water passing beneath. The ridge-tile is wider at one end than at the other, to cover another tile in succession under it, thus forming a ridge down the roof. Found in London.

*Coll. Chaffers, No. 717.*

- Ce. A. 185, 186. Two large Roman bricks, Ce. A. 185, found in London, Ce. A. 186, showing the general character of such bricks. From the Roman wall of Bustum, tumulus, No. 3, Rougham, Suffolk.

Ce. A. 185, *presented by Mr. Bunning*; Ce. A. 186, *by Professor A. C. Henslow.*



# ROMAN POTTERY FROM THE RHINE, FOR COMPARISON.

AS water-carriage down the Rhine, from districts bordering it, would have afforded easy means of establishing a commerce with Britain in the pottery made at several important stations on that river, it was thought desirable to obtain some illustrative specimens for comparison with the Roman pottery discovered in Britain. Those selected have been chiefly obtained from the collections of M. Levens of Cologne, and are stated to have been discovered in that city, or its vicinity. Should they all not have been there found, still, coming certainly from the Rhenish districts, they are important for the purpose contemplated. They are remarkable for being very illustrative examples of this kind of pottery, as manufactured on the north of the Alps. Cologne (*Colonia Agrippina*) became a large and flourishing place after A.D. 51, when the Emperor Claudius planted a colony there, naming it after his wife Agrippina, whose birth-place it was.\* Hence the pottery either made, or used there is valuable for comparison, particularly when the facility of water-carriage to and from it is considered. Trade in pottery could easily be carried on with Trèves or Trier (*Augusta Trevirorum*), once the capital of the Roman empire, north of the Alps, by the Rhine and Moselle, and with Britain, by means of the mouths of the Rhine. It seems probable that red lustrous Roman ware, of Rhenish manufacture,† was introduced into Britain.

A perfect, and consequently very rare, bowl of Roman red ware. Body red. Glaze lustrous. Height 6 inches; diameter 10 inches. Design (fig. 80.), a soldier in armour, with sword and shield, engaged in

Ce. A. f. 1.

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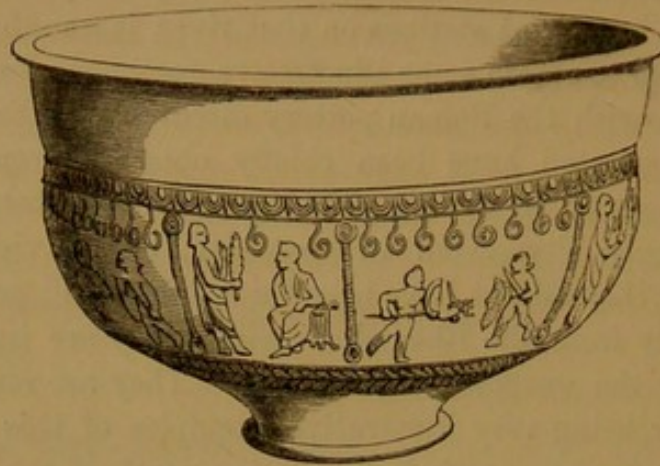
\* This locality was first occupied as a Roman camp. It became the chief town of the Ubii (*Oppidum* or *Civitas Ubiorum*), after that tribe was removed from the right bank of the Rhine to it, under Tiberius.

† This ware was certainly manufactured at Heiligenberg, near Mitz, about five leagues from Strasburg, where some of it was found in a Roman pottery kiln. The remains of Roman pottery kilns have been found in several localities near the Rhine, as at Rheinzabern (*Tabernia Rheni*), four leagues from Lauterberg, where fifteen kilns were discovered within a small area; Itter Weiler, four leagues from Heiligenberg, &c.



combat with a retiarius, holding on his left arm a net, with a sword, and in his right hand a three-pronged spear. There is also a draped figure presenting a palm branch to an Emperor, seated on a curule chair. Found at Cologne. *Coll. Levens.*

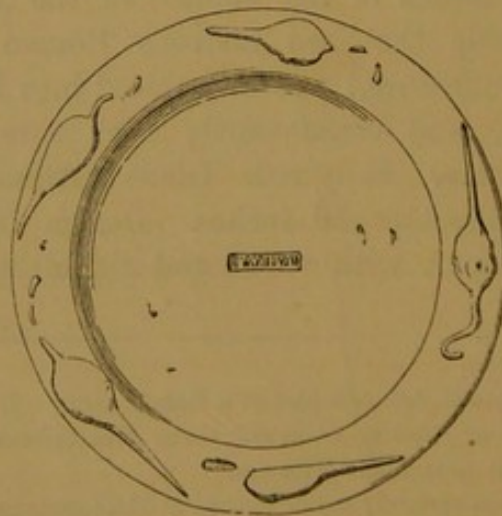
Fig. 80.



The manufacture and character of this bowl, and, generally, of the following specimens of the same ware from Cologne, closely agrees with the specimens of similar pottery found in England, where there is little evidence of any of it having been made. Indeed, it is not improbable that a considerable portion, at least, of this ware was derived from Southern Germany.\*

Ce. A. f. 2. A patera of red ware, 8 inches in diameter. On the edges, ivy leaves in relief, laid on in slip, or "*bar-*

Fig. 81.



\* The red ware kiln of Heiligenberg is described by M. Brongniart, *Traité des Arts Céramiques*, t. p. 248, and figured in the same work, after M. Schweighäuser, *Atlas*, pl. iv., figs. 1, 2, and 3.

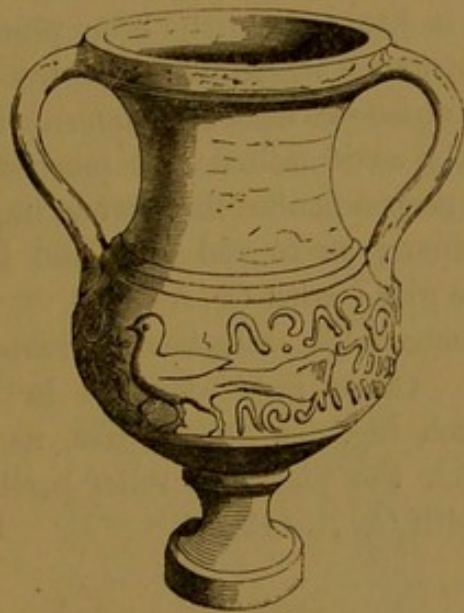


*botine*," as it is termed by M. Brongniart, after the patera was turned, as in the previous sketch (fig. 81.). Potter's mark, VRSVLVS. *Coll. Levens.*

By comparing this perfect specimen with the fragments, Ce. A. 26, *a*, *b*, and *c*, found in London, it will be observed that the ware, manufacture, and the kind of ornamentation are similar.\*

Vase of red ware,  $7\frac{1}{2}$  inches high, 5 inches in the greatest diameter, with two handles, and of the form represented in the annexed sketch (fig. 82.). Round the widest part of the vase is a design, laid on in slip or "*barbotine*," representing a peacock amid ivy leaves. This form does not appear to have been hitherto discovered in Britain.† *Coll. Levens.*

Fig. 82.



Small patera of red lustrous ware. Glaze somewhat crazed in places, both above and beneath, showing its thin character. Diameter  $6\frac{1}{2}$  inches. Potter's mark. *Ce. A. 4. f.*

*Coll. Levens.*

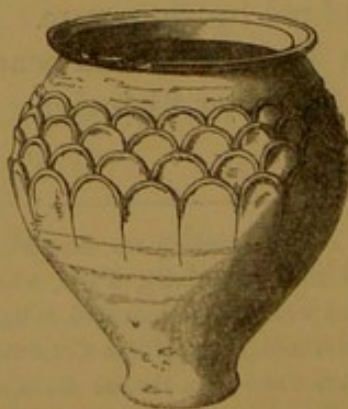
\* A patera, or low cup, of precisely the same kind of ware and mode of ornamentation, found at the Palace of the Luxemburg, Paris, where moulds for the manufacture of the ornamented red Roman ware were discovered, is figured by MM. Brongniart et Riocreux, in their *Description Méthodique du Musée Céramique de Sèvres*, pl. ix., figs. 15 *a* and *b*.

† A red Roman ware vase, of a similar form, and with raised engobe or barbotine ornaments, found on the site of a pottery at Rheinzabern, in 1804, and now in the museum at Sèvres, is figured in the *Desc. Meth. du Musée Céramique de Sèvres*, pl. ix., fig. 10.



- Ce. A. 5. f. Small patera of red lustrous ware. Diameter  $6\frac{3}{4}$  inches. Potter's mark, LOCIRNI. *Coll. Levens.*
- Ce. A. 6. f. Shallow patera of red lustrous ware. Diameter 7 inches. Perpendicular rim. Potter's mark. *Coll. Levens.*
- Ce. A. 7. f. Small shallow patera of red lustrous ware. Diameter  $5\frac{1}{2}$  inches. Perpendicular rim. Without potter's mark. *Coll. Levens.*
- Ce. A. 8. f. Acetabulum of red lustrous ware. Height  $2\frac{1}{2}$  inches; diameter  $4\frac{1}{2}$  inches. Potter's mark, OFCAR. (Compare with Ce. A. 18 and 19.) *Coll. Levens.*
- Ce. A. 9. f. Peculiarly shaped cup of red lustrous ware. Height  $2\frac{1}{2}$  inches; diameter  $4\frac{1}{2}$  inches. Potter's mark. *Coll. Levens.*
- Ce. A. 10. f. Small vase,  $5\frac{3}{4}$  inches high,  $4\frac{1}{2}$  inches in its greatest diameter. Body red, almost equal in texture to the finer kinds of the red lustrous ware. Glaze red at base, where it has apparently been plunged in some protecting substance when fired,—brown where it has been more exposed to heat. Ornament in the higher portion, partly as if milled and marked in a lathe; after which, perpendicular lines were impressed by a point. (Compare, as to red base and brown upper portion of the glaze, with Ce. A. 122.) *Coll. Levens.*
- Ce. A. 11. f. Vase,  $5\frac{3}{4}$  inches high, 5 inches in greatest diameter. Body white. Glaze red. Pattern in relief, as in annexed sketch (fig. ). (Compare, as regards the mode in which the pieces in relief partially overlap each other, with Ce. A. 113.) *Coll. Levens.*

Fig. 83.





Vase,  $4\frac{3}{4}$  inches high,  $3\frac{1}{2}$  inches in greatest diameter. Ce. A. 12. f.  
Body red, but much inferior to the red lustrous ware.  
Glaze red. (Compare with Ce. A. 86 and 87).

*Coll. Levens.*

Vase,  $4\frac{1}{2}$  inches high,  $3\frac{1}{2}$  inches in greatest diameter. Ce. A. 13. f.  
Body red, and somewhat coarse. Glaze partly red,  
and partly black, according to amount of firing. Scroll  
ornament in white slip.

*Coll. Levens.*

Patera, in general character resembling some of Ce. A. 14. f.  
those in Roman red lustrous ware. Diameter  $8\frac{1}{2}$   
inches. Body greyish white. Glaze black. The whole  
well fired. Potter's mark, inside a rayed circle,  
VOCARAP.

*Coll. Levens.*

Cup, 2 inches high, and  $4\frac{1}{4}$  inches in diameter. Ce. A. 15. f.  
Body white, light brown outside. Design, pieces par-  
tially overlapping each other, somewhat in the manner  
of Ce. A. 11. f.

*Coll. Levens.*

Vase,  $4\frac{1}{4}$  inches high,  $4\frac{1}{4}$  inches in greatest diameter. Ce. A. 16. f.  
Body whitish. Glaze metalloid. Design, as in the  
annexed sketch (fig. 84), representing dogs chasing  
deer and a hare, worked in slip or barbotine, in the  
manner mentioned p. \*. (Compare with Ce. A. 96,  
97, 99, 100, 101, 102, 104, 107, 108, 109, 110, and  
111.)

*Coll. Levens.*

Fig. 84.



Vase of similar ware and general character of orna- Ce. A. 17. f.  
ment. Height  $5\frac{3}{4}$  inches, 5 inches in greatest diameter.  
Design, in slip or barbotine, dogs hunting a hare, with

\* This kind of ware may have been manufactured by the Romans in many localities north of the Alps. A fragment of it, representing a hunting scene, from the remains of a Roman pottery at Rheinzabern (Taberna Rheni) is figured by Brongniart, in his *Traité des Arts Céramiques*, pl. xxix., fig. 1.



ivy leaves, similar to those upon the rim of the patera, Ce. A. 2. f., and the side of the vase, Ce. A. 3. f. (Compare for kind of manufacture, as for Ce. A. 16. f.)

*Coll. Levens.*

Ce. A. 18. f.

Vase,  $4\frac{1}{2}$  inches in height,  $5\frac{1}{4}$  inches in greatest diameter. Body grey white, glaze black. Pattern (fig. 85) from additional dots laid on, with a similar body to the vase, in slip or barbotine, after turning and before glazing and firing. (Compare with Ce. A. 102, as to laying on the dots.)

*Coll. Levens.*

Fig. 85.

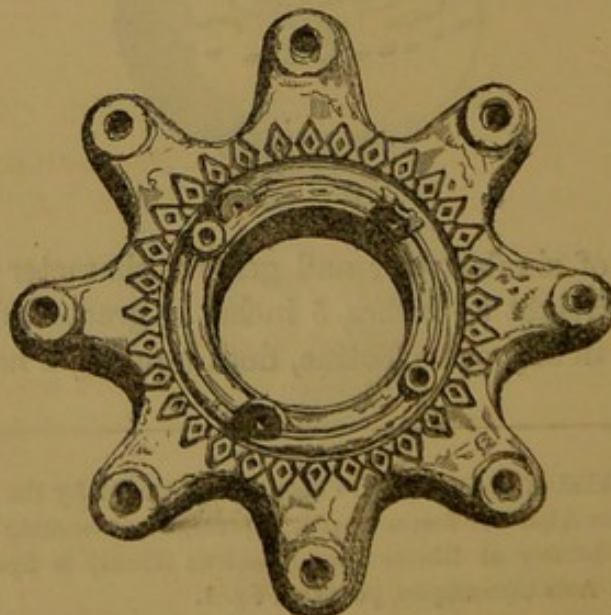


Ce. A. 19. f.

Lamp, with eight burners, formed to be suspended by the aid of three loops, upon an interior circle. Body white, coating red. Diameter  $7\frac{1}{2}$  inches. Form as in the annexed sketch (fig. 86).

*Coll. Levens.*

Fig. 86.





*Arretian Ware.*

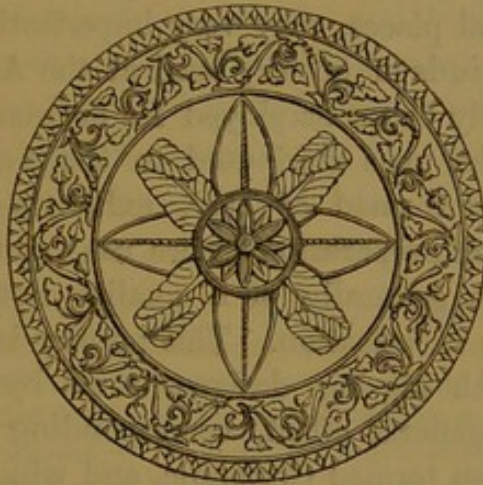
Cup of Roman red lustrous ware from Arezzo.\* Ce. A. 20. f.  
Height  $2\frac{1}{4}$  inches, diameter 5 inches. Body red, coating dull red, not very lustrous. Exhibits the usually higher style of art employed in ornamenting this kind of ware in Roman Italy. Side appearance shown by fig. 87; the design of the base by fig. 88.

*Coll. Chaffers, No. 1,028.*

Fig. 87.



Fig. 88.



## ANGLO-SAXON POTTERY.

After the Romans quitted Britain in the middle of *Anglo-Saxon* the fifth century, the pottery which they left behind *pottery*.

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\* Arretium or Aretium (modern Arezzo, in Tuscany,) was famous for its pottery. Pliny mentions it (Hist. Lib. xxxv. cap. 12.) as of a superior kind. Dr. Fabroni, in his *Storia degli Antichi Vasi Fittili Aretini* (Arezzo, 1841), refers to the various ancient and modern authors who have mentioned this ware, and certainly the plates to the work justify the high character given to it. The cup figured in plate viii. resembles Ce. A. 20. f. in general form. Plate v. contains figures of some interesting terra cotta moulds for this ware, found at Arezzo. The Arretian manufacture appears to have successfully continued down to the seventh century.



*Anglo-Saxon pottery.*

them appears to have continued in use among the inhabitants of the country, probably among the most important, and those connected with the Romans, as is shown by pieces of pottery, including vessels of red lustrous ware, found in graves considered to be of early Anglo-Saxon date. There may, indeed, be some difficulty with that kind of pottery which was certainly manufactured by the Romans in Britain, since it might be expected that potteries would be continued, for a time, at many of the former Roman sites, and that the forms given to the ware would also, for a time, be somewhat similar. With the vessels of the red lustrous ware, the evidence would be more definite, since there is little reason to suppose that this ware was manufactured in Britain. Even during the Roman occupation of Britain it was of sufficient value to be mended by rivetting (p. 60, and specimens Ce. A. 12*a*, 15, 16, 17, 36, 37, 38, 42, 43, 52, and 63).

*Coarse clays.*

The pottery transmitted to us by means of mounds or other burial places, may very imperfectly represent the various kinds of pottery used at the Anglo-Saxon time, especially those employed for ordinary domestic purposes. The urns attributed to the Anglo-Saxons are commonly formed of clay, exhibiting no great marks of much preparation before use, and appearing to have been generally of a quality not requiring much trouble in selection. This pottery is commonly impressed with zig-zag designs, some by no means deficient in general effect, corresponding with that which has been termed Germanic, and which extended into Gaul.\* The pottery itself has rarely been highly fired; indeed, some of it is scarcely more than sun or air dried. Of this kind, the Museum, as yet (1854) possesses no illustrative examples.

## MEDIEVAL POTTERY USED IN BRITAIN.

*Norman pottery.*

However difficult it may be to feel assured of the pottery used in Britain much anterior to the Norman conquest (1066), certain earthenware vessels have been

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\* Figures and descriptions of this kind of pottery will be found in Brongniart's *Traité des Arts Céramiques*, pl. 26, 27; Wright's *Celt, Roman and Saxon*, and other works.



discovered in situations, and under circumstances, pointing to their use, in this country, for ordinary domestic wants, in the times commonly termed medieval. The early examples are commonly of inelegant forms.\* Now and then a specimen may present somewhat of the designs of better periods; but almost all those which may be considered as of British manufacture, usually offer little that could be termed tasteful. At the same time, ordinary pitchers and cups seem to have been employed at tables of more important persons than might have been supposed, and were even thought worthy of notice in inventories of royal households.†

*Commonly  
coarse and of  
inelegant forms.*

While it is probable that earthen vessels of common manufacture continued in use in England, even in royal‡ and important noble§ households, down to the fifteenth and sixteenth centuries, such vessels, for the most part, made in this country, there is much reason to suppose that the German and Flemish wares found their way into those households, and that the earthen pots mentioned as "garnished with silver," were often of this better kind of manufacture. Of the German stone-ware, that of Cologne was the most celebrated, and exported to various countries, England among

*Used in Royal  
and important  
households.*

\* Mr. Chaffers, in his notes "On Medieval Earthenware Vessels," Journ. of the British Archaeological Association, 1 vol., p. 24, figures some of these forms, taken from Norman manuscripts, for comparison with vessels in his collection referred to medieval times. Several of these, found in London, are now in this Museum.

† Thus, as is quoted by Mr. Chaffers, there is the following entry in the payments of the executors of Eleanor, wife of Edward I., in the thirteenth century:—"Item, Julianæ La Potere, pro ccc picheriis, viijs. vid." And in the same document:—"Item, Johanni Le Squeler (maker of porringers, dishes, and basins), pro M<sup>o</sup>. et D. discis, tot platellis, tot salseriis, et cccc chiphis. xlijs."

‡ In the regulations for the household of Edward IV. (latter part of fifteenth century), among the orders for the "pitcher-house," it is directed that "the butler for the mouthe deliverythe nightly at the buttery barre for the kynge for all nyght, with the ale in new ashen cuppes, and two other for the watche, which of ryghte should be delyveryd againe at the cupbourde in the mornynge, with the pottes to serve men of worshippe in the halle."—*Liber Niger*, p. 78.

§ Mr. Chaffers points to the household book of the Earl of Northumberland (1512), as showing the common use of earthen pots at the tables of his dependants, adverting to the order, that "Whereas erthyn potts be bought, that ledder potts be bought for them for serving for lyveries and meallys in my lord's hous." An election feast of the Drapers' Company, in 1522, is quoted, at which earthen pots were used for ale and wine, gilt cups being employed "for red wine and ipocras." So late as 1663, Pepys (Diary) mentions drinking out of "earthen pitchers," sitting at the merchant stranger's table at a Lord Mayor's feast.



*Use of German and Flemish wares in England, in the sixteenth century.*

others.\* It was in high repute in the sixteenth century. The Flemish ware, commonly known as "Gres Flamand," was also in great esteem from about 1540 to 1620, when this and the German manufactures of stone-ware are considered to have been injured by the introduction of Chinese porcelain into Europe. The stone-ware known as Jacobus Kannetje is of somewhat earlier date, the fifteenth century. It is not improbable that, occasionally, some pieces of the Nuremberg stone-ware of the fifteenth and sixteenth centuries, so famed in its time, may have found its way into England.†

Ce. M. 1.

Jug, considered of early English manufacture. Height 10 inches, greatest diameter 9 inches. Body light brown. Covered, in great part, outside, with a

\* Mr. Chaffers mentions (Journ. Archaeological Association, vol. 5, p. 38), having found the following curious documents relating to the importation of Cologne stone-ware into England, among the Lansdowne MSS. (108, fol. 60). It is addressed to Queen Elizabeth.—"The seute of William Simpson, merchant.—Whereas one Garnet Tynes, a straunger living in Acon (Aix-la-Chapelle), in the parte beyond the seas, being none of her maties subjecte, doth buy uppe all the pottes made at Culloin, drinking stone pottes, and he onlie transporteth them into this realm of England, and sellethe them: It may please your matie to graunte unto the sayd Simpson full power and onelie licence to provyde, transport, and bring into this realm the same or such like drinking pottes; and the sayd Simpson will putt in suretie that it shall not be prejudiciall to anie of your maties subjectes, but that he will serve them as plentofullie, and sell them at as reasonable price as the other hath sold them from tyme to tyme.

"Item. He will be bound to double her maties custome by the year, whenever it hath been at the most.

"Item. He will as in him lieth drawe the making of such like potte into some decayed town within this realm, wherebie many a hundred poore men may be sett to work.

"Note. That no Englishman doth transport any potte into this realm, but onlie the sayd Garnet Tynes; who also serveth all the Lowe Countries and other places with pottes."

By one of the "Items," it would thus appear that there was then no manufactory of such pots in England. Probably the chief part of, if not all, the drinking vessels known as "Grey-beards," and "Bellarmines," so much used in public-houses and inns in the sixteenth and seventeenth centuries, were all imported from Germany. It has been supposed that similar vessels were manufactured in England by German and Flemish workmen.

Mr. Marryat remarks (Hist. of Pottery and Porcelain, p. 81), that "stone-ware, ornamented with devices in white clay, was made in the seventeenth century at Fulham, also at Lambeth, and subsequently in Staffordshire; but there is no satisfactory evidence of any earlier manufactory in England."

The clays for much of the Cologne ware came from Langer Wehe, between Düren and Eschweiler, on the way from Cologne to Aix-la-Chapelle.

† The Fulham stone-ware manufacture of Mr. Dwight, for which a patent was obtained in 1684, one based on some of his experiments made as early as 1640, seems never to have attained any great perfection.



peculiar green glaze. Bottom ornamented with numerous indentations, apparently punched in by the fingers. Broken at top and one side. Found in Queen Street, Cheapside, August 1842.

*Coll. Chaffers, No. 12.*

Upon analysis, under Dr. Hofmann, at the chemical laboratory of this Museum, this green glaze was found to be a silicate of the oxide of lead, coloured by a silicate of the protoxide of iron and copper. <sup>Dark green glaze.</sup>

Silica	-	-	43·04
Protoxide of lead	-	-	48·34
Protoxide of iron	-	-	3·31
Protoxide of copper	-	-	1·31
*Lime, alumina, &c.	-	-	4·32

Small jug, apparently of the same ware as Ce. M. 1. Ce. M. 1 b. Height  $4\frac{3}{4}$  inches. Greatest diameter  $4\frac{1}{2}$  inches. In part covered with similar green glaze. Found in London.

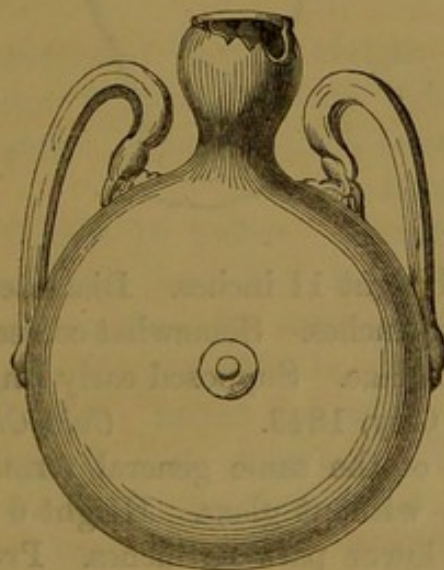
*Presented by Mr. Roach Smith.*

Portion of similar pottery, representing an arm. Ce. M. 1 c. Found in the King's Head Yard, Leadenhall Street, 1847.

*Coll. Chaffers, No. 28.*

Large and somewhat ball-shaped "Pilgrim's Bottle." Ce. M. 2. Body cream colour, no glaze. Height 10 inches.

Fig. 89.



\* Of these substances, the lime formed 1·03, alumina 2·65, and potash and soda 0·64 of the whole. This mixture was probably formed by dusting galena (sulphuret of lead), with iron and copper scales, upon the jugs before firing, when the silicates were produced by the silica then obtained from the body or paste, the lime alumina and alkalies also being derived from the same source.



*Medieval pottery  
in England.*

Greatest width  $8\frac{1}{2}$  inches. The two sides separately turned, and joined together in the line of two handles. Form as in the annexed sketch (fig. 89), much like that of a modified Roman amphora, of the short kind noted Ce. A. 163, fig. 73. Found in Cannon Street, 1851.

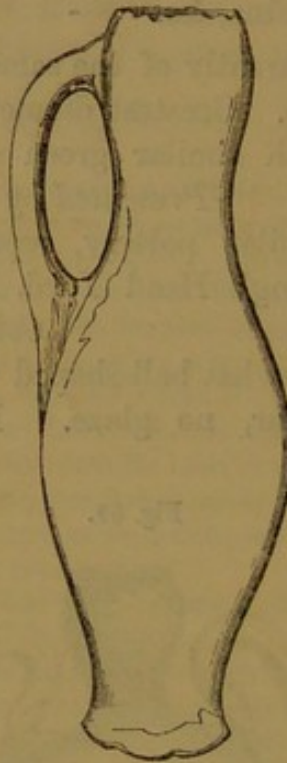
*Coll. Chaffers, No. 730.*

Ce. M. 3.

Early English jug. Height  $16\frac{1}{2}$  inches. Greatest diameter  $6\frac{1}{2}$  inches. Body light coloured. Partially covered with a yellow glaze. Form as in the annexed sketch (fig. 90). Found in Cannon Street, City, 1853.

*Coll. Chaffers, No. 988.*

Fig. 90.



Ce. M. 4.

Tall jug. Height 11 inches. Diameter at base, the widest part,  $4\frac{1}{2}$  inches. Somewhat coarse cream-colour body, without glaze. Supposed early English. Found in Lad Lane, City, 1843.

*Coll. Chaffers, No. 1.*

Ce. M. 5.

Small jug, of the same general form. Body finer and more red, without glaze. Height 6 inches. Diameter at the lower part  $2\frac{1}{2}$  inches. Probably of the same general date. Top broken. Found in Cannon Street, City, 1848.

*Coll. Chaffers, No. 80.*

Ce. M. 6.

Short, thick jug. Height  $7\frac{1}{2}$  inches. Greatest diameter  $5\frac{1}{2}$  inches. Body red. Pattern in yellowish white pipe-clay, completed by brownish glaze, partially



laid on. Base, finger pressed, with three fingers, in three places. Upper lip also finger pressed in two places. Found in Cannon Street, City, 1848.

*Coll. Chaffers, No. 52.*

Jug, 8 inches high, and 4 inches in diameter above Ce. M. 7. the centre. Body, cream-colour. Upper part of outside covered with transparent glaze, spotted with black. Form as in the annexed sketch (fig. 91). Found at London Wall, May 1844.

*Coll. Chaffers, No. 3.*

Fig. 91.

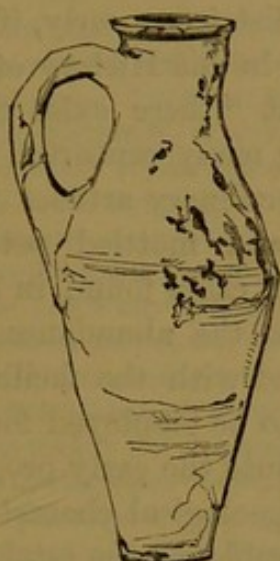
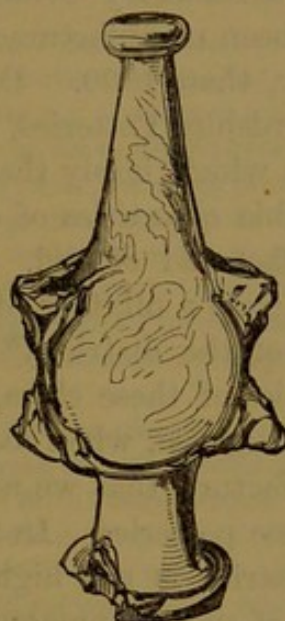


Fig. 92.



Small bottle-formed jug. Height  $5\frac{1}{2}$  inches. Ce. M. 8. Greatest diameter 4 inches. Body light ash-colour. Slate-coloured glaze. Found in Cock Lane, Smithfield, April 1844.

*Coll. Chaffers, No. 24.*

A costrel. Height 10 inches. Breadth  $5\frac{1}{2}$  inches, Ce. M. 9. measured across projections, two on each side, pierced for passing a cord or strap, for suspending the costrel, in the manner of a Pilgrim's Bottle. Body red, glazed, in a marbled pattern, mixed red and white. Mentioned and figured (side view) by Mr. Chaffers; *Journal of the Archæological Association*, vol. v., p. 33. Front form as above (fig. 92). Found in London, August 1850.

*Coll. Chaffers, No. 917.*

Small bottle-formed jug. Height 3 inches. Greatest diameter  $2\frac{1}{2}$  inches. Body cream-colour, glazed all over. Found in Cannon Street, City, 1850.

*Coll. Chaffers, No. 916.*



## STAFFORDSHIRE POTTERY AND PORCELAIN.

*Early use of the Burslem, and other district clays, in the Staffordshire potteries.*

Though the district in Staffordshire, named "*the Potteries*," has been long known for the ware there manufactured, its early condition, as regards the production of such ware, is somewhat difficult to trace. It has, indeed, been supposed, that its clays were known to, and made into pottery by, the Roman occupants of that part of Britain, but of this there seems little satisfactory evidence. Coarse ware appears to have been manufactured in the district as early, if not earlier, than 1500. Dr. Shaw, in his *History of the Staffordshire Potteries*, says, that "there exist documents which imply that, during many centuries, considerable quantities of common culinary articles were manufactured of red, brown, and mottled pottery, made from a mixture of different clays found in most parts of the district."\* It is to the abundance and varieties of these clays, combined with the facility of obtaining coal, when coal came to be employed for the manufacture, that we may attribute the early progress of these potteries. In fact, the geological character of the district is one highly favourable to the establishment of such manufactures; and, though the materials now employed for the earthenware and porcelain so abundantly produced in the district, may be derived from other localities, its supply of coal, and of refractory clays for the firebricks required in the works, the actual establishment of those works, and the skilled labour at hand, still make it the chief locality for the ceramic manufactures of this country.

*Act of Parliament respecting the Burslem butter-pots.*

The manufacture of butter-pots appears to have been early undertaken. It was of sufficient importance in 1670 to attract the attention of the government, the Burslem potters being then compelled by Act of Parliament to make their pots of a size to hold 14 lbs. of butter, and sufficiently hard so as not to

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\* *History of the Staffordshire Potteries*, Hanley, 1829, 12mo., by Dr. Simeon Shaw, p. 97. This work, apparently now scarce, contains much valuable local information respecting the potteries.



imbibe moisture, by which the butter appeared of greater weight than that actually sold.\*

The clays used in the seventeenth century appear to have all come from the neighbourhood, and for the most part from the coal measures. Fine sand, for admixture with them, was obtained from the hilly part of Baddeley Hedge and Mole Cob. Plott, in his *History of Staffordshire*, published in 1686, presents *Plott's account of the clays used in 1686.* us with a valuable statement as to the clays then used, and the manufacture at that time, including the mode of glazing.† Up to 1680, the glazing employed seems

\* Dr. Shaw, writing in 1829, remarks, "that the common people of the district, at the present day, call Irish tub butter, pot butter." Plott, *Nat. Hist. Staffordshire*, 1686, p. 108, says, "The butter they buy by the pot, of a long cylindrical size, made at Burslem, in this county, of a certain size, so as not to weigh above six pounds at most, and yet to contain at least fourteen pounds of butter, according to an Act of Parliament made about 14 or 16 years agoe, for regulating the abuses of this trade." He also mentions that the cheesemongers of London had established a factory at Uttoxeter, and that the parties laid out, in the season, more than 500*l.* on market days for butter and cheese. The factors kept a surveyor, who tried the pots with an instrument. It was an object that the pots should be hard, and not so porous as to imbibe much water, which might be counted in the weight for butter.

† The following is Plott's account: After mentioning the Amblecot clay as the best, and as used at the glasshouses at Amblecot, and other places in Staffordshire, for their pots, he continues, "Other potter's clays for the more common wares, there are at many other places, particularly at Horsley Heath, in the parish of Tipton; in Monway Field, abovementioned, where there are two sorts gotten, one of a yellowish colour mixt with white, the other blewish; the former stiff and weighty, the other more friable and light; which mixt together, work better than apart: of these they make divers sorts of vessels at Wednesbury, which they paint with slip, made of a reddish sort of earth gotten at Tipton. But the greatest pottery they have in this county, is carried on at Burslem, near Newcastle-under-Lyme, where for making their several sorts of pots, they have as many different sorts of clay, which they dig round about the towne, all within half a mile distance, the best being found nearest the coale, and are distinguish't by their colours and uses as followeth:—

1. Bottle clay, of a bright whitish streaked yellow colour.
2. Hard fire clay, of a duller whitish colour, and fuller intersperst with a dark yellow, which they use for their black wares, being mixt with the
3. Red blending clay, which is of a dirty red colour.
4. White clay, so called, it seems, though of a blewish colour, and used for making yellow-colour'd ware, because yellow is the lightest colour they make any ware of.

All which they call throwing clays, because they are of a closer texture, and will work on the wheel.

"26. Which none of the three other clays, they call slips, will any of them doe, being of looser and more friable natures; these mixed with water, they make into a consistence thinner than a syrup, so that being put into a bucket it will run out through a quill, this they call slip, and is the substance wherewith they paint their wares; whereof the

1. Sort is called the orange slip, which before it is work't, is of a greyish colour mixt with orange balls, and gives the ware (when annealed) an orange colour.



*Lead glazing up* to have been plumbiferous, a silicate of lead, forming a glass coating, being formed; the silica derived from the body of the ware, in the firing, and the lead from to 1680.

2. The white slip, this before it is work't, is of a dark blewish colour, yet makes the ware yellow, which being the lightest colour they make any of, they call it (as they did the clay above) the white slip.

3. The red slip, made of a dirty reddish clay, which gives wares a black colour.

Neither of which clays or slips must have any gravel or sand in them; upon this account, before it be brought to the wheel, they prepare the clay by steeping it in water in a square pit, till it be of a due consistence; then they bring it to their beating board, where with a long spatula they beat it till it be well mix't; then being first made into great squarish rolls, it is brought to the wageing board, where it is slit into flat thin pieces with a wire, and the least stones or gravel pick't out of it. This being done, they wage it, i. e., knead or mould it like bread, and make it into round balls proportionable to their work, and then 'tis brought to the wheel, and formed as the workman sees good.

"27. When the potter has wrought the clay either into hollow or flat ware, they set it abroad to dry in fair weather, but by the fire in foule, turning them as they see occasion, which they call whaving: when they are dry they stouk them, i. e., put ears and handles to such vessels as require them. These also being dry, they then slip or paint them with their severall sorts of slip, according as they designe their work, when the first slip is dry, laying on the others at their leisure, the orange slip makeing the ground, and the white and red, the paint; which two colours they break with a wire brush, much after the manner they doe when they marble paper, and then cloud them with a pensil when they are pretty dry. After the vessels are painted, they lead them, with that sort of lead-ore they call smithum, which is the smallest ore of all beaten into dust, finely sifted and strewed upon them; which gives them the gloss, but not the colour; all the colours being chiefly given by the variety of slips, except the motley-colour, which is procured by blending the lead with manganese, by the workmen call'd magnus. But when they have a mind to shew the utmost of their skill in giving their wares a fairer gloss than ordinary, they lead them then with lead calcined into powder, which they also sift fine and strew upon them as before, which not only gives them a higher gloss, but goes much further too in their work, than lead-ore would have done.

"28. After this is done, they are carried to the oven, which is ordinarily above 8 foot high, and about 6 foot wide, of a round copped forme, where they are placed one upon another from the bottom to the top; if they be ordinary wares such as cylindricall butter-pots, &c. that are not leaded, they are exposed to the naked fire, and so is all their flat ware though it be leaded, haveing only parting shards, i. e., thin bits of old pots put between them, to keep them from sticking together: but if they be leaded hollow-wares, they doe not expose them to the naked fire, but put them in shragers, that is, in course metall'd pots, made of marle (not clay) of divers formes according as their wares require, in which they put commonly three pieces of clay called bobbs, for the ware to stand on, to keep it from sticking to the shragers; as they put them in the shragers to keep them from sticking to one another (which they would certainly otherwise doe by reason of the leading) and to preserve them from the vehemence of the fire, which else would melt them downe, or at least warp them. In twenty-four hours an oven of pots will be burnt, then they let the fire goe out by degrees, which in ten hours more will be perfectly done, and then they draw them for sale, which is chiefly to the poor crate-men, who carry them at their backs all over the countrey, to whome they reckon them by the piece, i. e., quart, in hollow ware, so that six pottle, or three gallon bottles make a dozen, and so more or less to a dozen, as they are of greater or lesser content; the flat wares are also reckon'd by pieces and dozens, but not (as the hollow) according to their content, but their different bredths."



ordinary lead ore (galena, sulphuret of lead,) from the Derbyshire mines, dusted, in a pulverised state, upon the unbaked ware, through coarse cloth. Glazing by means of salt was discovered by accident in 1680.\*

*Salt glaze used in 1680.*

About 1685, a rude kind of white stone-ware was made by Mr. Thomas Miles, of Skelton, by mixing the whitish clay found at Skelton, with sand from Baddeley Hedge; and another Mr. Miles manufactured brown stone-ware by using the same sand with Can marl, from the coal measures.

*White and brown stone-ware.*

"Crouch-ware" was first made by the Burslem manufacturers in 1690. In making this ware, according to Dr. Shaw, the common brick clay and fine sand from Mole Cob were first used, and subsequently Can marl and this sand, some persons employing dark grey clay from the coal-pits and the sand. The salt glaze was used for this ware, some of the principal potters adding a pint of red lead, in powder, to each bushel of salt.† Around the ovens employed for firing the "crouch-ware," there was a scaffold on which a fireman stood to cast in the salt. The vapour arising from the salt glazing of this and other ware, about the end of the seventeenth century, is described as being so considerable from about eight to twelve o'clock, on Saturday mornings, in the town of Burslem, as to produce a dense white cloud, sometimes so thick as to cause persons to run against each other in the streets.‡

*Crouch-ware first made in 1690.*

*Dense vapour from glazing by means of salt.*

At that time the ovens are described "as always adapted to the quantity of articles made during each week; and no manufacturer of that period fired more than one oven-full weekly, commencing on Thursday night and finishing about mid-day on Saturday. There were then about twenty-two ovens in Burslem, each with eight mouths, at equal distances."

*Twenty-two ovens at Burslem about 1700.*

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\* The account given is that, in 1680, at Stanley farm, near Mr. Palmer's pottery, at Bagnall, the servant of Mr. Joseph Yates was boiling salt in water to be used in curing pork, and that during her temporary absence, the mixture boiled up, falling over the sides of an earthen pot containing it. The earthen pot became red hot, and when cool was found to be glazed. Mr. Palmer availed himself of the accident, glazing common brown ware by means of salt, and in this he was soon followed by other manufacturers.

† Hist. of the Staffordshire Potteries, p. 110.

‡ Hist. of the Staffordshire Potteries, p. 112.



*Establishment  
of the Elers at  
Burslem.*

In 1690, the Elers, brothers, came from Nuremberg, and established themselves at Bradwell, about two miles from Burslem, finding a clay there which suited their purposes. They are stated to have had another pottery at Dimsdale, also near Burslem. It may be inferred, from the character of the ware produced by them, that they were persons of much skill and taste. Their object seems to have been to manufacture a red ware similar to that of Japan, it being desirable at that time to imitate the porcelain and other pottery of China and Japan. They used great secrecy in their mode of manufacture. An idiot turned the thrower's wheel, and the most ignorant labourers were employed for those parts of the work not executed by the Elers themselves. Eventually, Mr. Astbury,\* by feigning idiocy, and obtaining entrance to the works, learned the secret processes, and made red ware,† and in this he was followed by others. From the competition thus arising, and from annoyance by the other potters of the district, the Elers discontinued their works, and according to Dr. Shaw, removed to Lambeth or Chelsea in 1710.‡

*Chester clays.*

Prior to the use of the salt glaze and Biddeford clay, first known, as well as the Dorset clays, by the name of *Chester clays*, because there imported to be sent to the Staffordshire potteries, the clays used at Burslem, and the coals for the twenty-two ovens then in work, were taken from the sides of the adjacent lanes. The holes then made were not altogether filled up in 1829.§

*Use of Bidde-  
ford clay.*

Astbury, after establishing his red-ware works, employed Biddeford pipe-clay,|| at first for the interior

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\* Mr. Astbury died in 1743, at the age of 65 years.

† Dr. Shaw (History of the Staffordshire Potteries, p. 118,) mentions that a person named Twyford was supposed to be the first, by pretending carelessness, to have entered and found out the process of the Elers. He adds, that Twyford and Astbury carried on a manufactory together, making red porcelain (?) and white pottery, and employing a salt glaze.

‡ Dr. Shaw states that they there "connected their new manufacture with the glass manufacture established in 1676 by the Venetians, under the auspices of the Duke of Buckingham."—Chemistry of Pottery, 1837, p. 411. According to Mr. Marryat (History of Pottery and Porcelain, p. 82), the Elers quitted Staffordshire in 1720, contributing "their skill and industry to the establishment of the Chelsea porcelain manufactory."

§ Hist. of Staffordshire Potteries, p. 124.

|| It is stated in Lyson's Magna Britannia (Devonshire, p. cxcii., published in 1822), that this "pipe-clay was formerly dug in great abundance at Weare Gifford, and in the



only of vessels, afterwards, mixed with Shelton marl, for his white-ware, so successfully, that he soon entirely rejected the other district clays, making "white dipped or white stone-ware." The discovery of the use of *Use of flint in the pottery.* pounded flint for the body of earthenware, in 1720, above-mentioned (p. ), was the cause of great improvements in its manufacture. There was a considerable demand for the ware formed of the Devonshire (Biddeford) clay and flint, between 1730 and 1740. About this time the *sun-pans*, or tanks in which the clay was left to become fit for use, were superseded by the use of the *slip-kiln*, in which the clays were boiled or simmered.\*

About this time also, the Burslem manufacturers, *Plaster of Paris moulds adopted.* finding that those of France used plaster of Paris moulds for their ware, adopted the same plan. Mr. Ralph Daniel, of Cobridge, visited a porcelain manufacture in France, probably that of Sèvres, learned how the moulds were made, brought over one, and explained the method of making and using them to the Staffordshire potters.

About 1750, more attention was paid to properly *Improved preparation of the clays.* preparing the district clays for use, and these are recorded to have been especially well worked by Mr. Enoch Booth.†

Although the Staffordshire pottery was by no means so deficient, either in tasteful design or in execution, as

parishes of Peter's Merland and Petrockstow. It was sent coastwise, and by canals, to the potteries in Staffordshire. The pits in the last-mentioned places have not been worked for twenty years." The ware made of this clay and flint was considered liable to crack when highly fired or suddenly heated.—Hist. of Staffordshire Potteries, p. 160.

\* The following will show the size and method of working the clays in the sun-pans: "The sun-kiln is formed usually square, 10 to 20 feet in extent each way, and about 18 inches deep; having at one corner, a smaller place, deeper, and lined with slabs or flags. The clay after being brought out of the mine is spread abroad on the adjoining ground, and frequently turned over by the spade during two or three seasons, that it may be well exposed to the action of the atmosphere (called weathering). Into the smaller vat a quantity of clay is thrown, and by a proper tool plunged in the water by agitation, till all the heavier particles and small stones sink to the bottom; the fluid mass is next poured into a sieve, thro' which it runs into the largest vat, or sun-kiln, until the whole surface is covered to the depth of three or four inches, which is left to be evaporated by solar action. When this is partially accomplished, another layer, and a third, and a fourth are added, until the mass is from 12 to 18 inches deep; and the whole is then cut out, and placed in a damp cellar for use."—Hist. of the Staffordshire Potteries, p. 90.

† Hist. of Staffordshire Potteries, p. 178.



*Advance caused  
by Wedgwood.*

*Birth and early  
occupation of  
Wedgwood.*

*Queen's-ware.*

*Vases, medal-  
lions, and cameos  
of Wedgwood.*

has been often supposed, anterior to the productions of Wedgwood, there can be little doubt that this justly celebrated potter gave a new impulse to the manufactures produced at the potteries. It would appear that his early education did not extend beyond the common reading and writing then taught to boys at his birth-place, Burslem; but he was one of those who continue to educate themselves through their whole lives, and thus acquire deserved advantages and

reputation. He was born in August 1730, and at eleven years of age worked at a small pottery of his father's, at Burslem, as thrower. When grown up he entered into a partnership, of short duration, with Mr. Harrison, of Stoke-upon-Trent, and subsequently, with Mr. Wheildon, manufactured imitation-agate knife-handles, and objects of that kind. This connexion not suiting Wedgwood's views, he returned to Burslem, in 1759, and set up business for himself in small thatched works, manufacturing small ornamental articles.\* After two removes into other premises, he much improved the "cream-ware"† of the time, and having found means of introducing it to the attention of Queen Charlotte, she so admired it as to desire it should be named "Queen's-ware." This began his reputation and fortune, and orders soon flowed freely to his manufactory at Burslem. Wedgwood was also fortunate in connecting himself with Mr. Bentley, who became his partner, managing a warehouse for Wedgwood's pottery in London. Mr. Bentley's acquirements and knowledge of persons connected with art, and of their patrons, enabled him to procure works of art for imitation, and hence those earthenware cameos, medallions, vases, and other objects for which Wedgwood became so celebrated.‡ He continued to increase

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\* In a small tenement near the Church-yard Works, Burslem, owned by his father, Thomas Wedgwood.

† *Cream-ware* was first made by Mr. Wood, much improved by Mr. John Greatback, and still further improved by Wedgwood.

‡ Following up these elegant manufactures, he contested the purchase of the Barberini vase, then on sale by auction, with the Duchess of Portland; and only gave up the contest upon condition of being permitted to copy it. The Duchess then became the purchaser at 1,800 guineas, and the vase, now at the British Museum, became known as the Portland Vase. Wedgwood made fifty beautiful copies of this vase, selling them at fifty guineas each; but it is understood that the money received did not cover the cost of their manufacture.



his fame and fortune until his death, in January 1795, *Death of Wedgwood.* at Etruria (near Newcastle-under-Lyne), where he had finally established his works.

Mr. Carver, an engraver of Liverpool, having *Printing from copperplates, upon the glaze.* invented a method of printing, from copper-plates, *upon the glaze,* Wedgwood, in his earlier days, used to send down cream-ware to Liverpool to be thus printed, the ware being returned to Burslem. A tea service, well authenticated to have been thus sent down from the Bell works in 1767, is described as "excellent in quality and very fine in embellishment."\* Before Wedgwood established enamelling in colours on his own premises, he used to send his ware to be painted to Mrs. Astbury, in Hob Lane, Burslem. The first suc- *Gold-leaf gilding.* cessful attempt, in the district, at employing gold-leaf for ornamental purposes on the ware, is stated to have been made by Sarah Elkin, then a servant of Mr. Wedgwood, at Etruria. The method of gilding by means resembling that of water gilding, instead of employing *Water-gilding.* gold leaf, was subsequently, and prior to 1800, introduced by John Hancock.†

The introduction of the Cornish clay (Kaolin) and *Introduction of Cornish Kaolin and porcelain granite.* China stone, into the Staffordshire potteries, was the means of producing a considerable advance in, and extension of, the wares there made. Mr. Jacob Warburton is stated to have been the person to whom that district is most indebted for the introduction of the porcelain manufacture. He, with others, forming a *Purchase of Cookworthy's patent.* company, purchased Champion's (Cookworthy's) patent, in 1777.‡

\* Hist. of Staffordshire Potteries, p. 192. Carver was in the service of Messrs. Sadler and Green, of Liverpool, and it would appear that they employed Carver to execute the printing. Dr. Shaw, at the same time states, that the first printer of the kind is said to have been Harry Baker, of Hanley, Staffordshire, who obtained the necessary impressions from copper-plates borrowed from a bookbinder. The same person, after Messrs. Sadler and Green were much employed in this kind of printing, offered his services to the manufacturers of the district as printer on the glaze, in black, red, and other colours, and soon became fully occupied. Mr. John Robinson quitted the employ of Messrs. Sadler and Green to execute the same kind of printing for Wedgwood, but finally worked for any of the potteries, and also as enameller.

† Hancock was then employed by Messrs. Turner, of Lane End.

‡ According to Dr. Shaw (Hist. of Staffordshire Potteries, p. 200), Champion at this time sold his patent to a company of Staffordshire potters, consisting of Messrs. S. Hollins, of Shelton, Anthony Keeling, of Turnstall, John Turner, of Lane End, Jacob Warburton, of Hob Lane, W. Clowes, of Peet Hill, and Charles Bognall, of Shelton. When Cookworthy's patent expired, there was great opposition to the extension of it petitioned for



*Use of felspar  
and bones.*

Felspar was first employed in the Staffordshire potteries, by Mr. Josiah Spode, towards the end of the last century, and the use of bones, in the manufacture of porcelain, was introduced at the same works in 1800.

*Extension of  
earthenware and  
porcelain manu-  
facture.*

The manufacture of earthenware and porcelain now became considerably extended in this district. In 1816, the manufacturers assembled to celebrate the fiftieth anniversary of the opening of the canal, so important to them, between the Trent and the Mersey. A museum was then inaugurated, illustrative of the progress of Staffordshire pottery, some well known old works, closed for many years, being searched for specimens. A selection of these illustrations, up to the end of the last century, obtained from Mr. Enoch Wood, to whom the collection belonged, forms the base of the Staffordshire series exhibited in this museum.

*Mr. Enoch  
Wood's museum.*

*Pottery district  
in 1829.*

Dr. Shaw, writing in 1829, describes the district known as the potteries, as being then about 10 miles long, with breadths varying from 3 to 5 miles. He estimated that about 50,000 persons were then employed in the potteries, in the parishes of Stoke, Burslem, and Wolstanton, including operatives, colliers, and persons engaged on the canal, bringing raw materials, or carrying away manufactured articles.\*

*In 1837.*

The same author, writing in 1837,† estimated that 30,000 persons were employed at Stoke-upon-Trent, for the various earthenware and porcelain works, terming the former *Delft-ware*, a name by which it was long known in commerce. Mr. Arnoux, in 1852, considered the number of persons more or less

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by Champion. Finally, it was arranged, by Act of Parliament, that while Champion was confirmed in the "sole and exclusive application of the Cornish clay and stone for the manufacture of *transparent* ware, however it might be named, porcelain, or known by any other designation, it allowed the potters generally the free use of the stone in the opacous glazes, and of the clay in opaque pottery. The company agreed to supply ground stone from their mills for any manufacturers, not to be used in glaze of a transparent body" (p. 203.) Champion resided in the potteries until 1782, when he was appointed Paymaster of the Forces under Mr. Burke. He died at Camden, South Carolina, 1787.

\* History of the Staffordshire Potteries. Judging from the number now employed, and the extension of the potteries since that time, 50,000 persons would appear an over estimate.

† Chemistry of Pottery and Glass.



engaged in the 133 factories of the potteries as about *Population employed in 1852.*  
60,000.\*

After the introduction of bones into the body of the *Soft porcelain.*  
ware, the manufacture of *soft* porcelain became much  
extended in the Staffordshire potteries, the raw  
materials for which were and are chiefly imported  
through Liverpool. *Hard* porcelain was not introduced *Hard porcelain.*  
into the district until 1850, when Mr. Minton produced  
excellent ware of this kind. About 10 years since a  
particular kind of porcelain was invented at the  
potteries, known as *Statuary, Parian, or Carrara Statuary or*  
*biscuit,*† of which very beautiful statuettes and other *Parian biscuit.*  
objects have been, and are, manufactured by Messrs.  
Minton, Copeland, Wedgwood, and many others.

The chief mineral substances employed consist of *Chief substances employed.*  
Kaolin (China-clay), from Cornwall and Devon, por-  
celain granite (China-stone), from the same counties,  
natural clay from Dorset (Poole clay), flints from the  
chalk districts, and felspar from Norway and other  
places.

The Staffordshire potteries still continue to afford *Earthenware and porcelain produced in 1852.*  
the great mass of earthenware manufactured in this  
country, at the same time contributing a large portion  
of the porcelain produced. The amount of both has  
even increased since Mr. Arnoux, in 1852, estimated  
the yearly value of English pottery manufactured at  
2,000,000*l.*, 84,000,000 pieces of the value of 1,220,000*l.*  
being then exported.‡

Butter pot,  $7\frac{1}{2}$  inches high, diameter uncertain, from Ce. B. 1.  
warping. Apparently a cast-away from some works  
of the time. Body coarse; glaze, silicate of the oxide

\* Lecture on Ceramic Manufactures, Lectures on the Results of the Great Exhibition of 1851, vol. ii., p. 380. See also note, *ante*, p. 22, where the value of British exports in earthenware and porcelain is mentioned.

† Mr. Arnoux (Lecture on Ceramic Manufactures, p. 400,) points out that this biscuit only differs from porcelain in the employment of an easily fusible felspar instead of Cornish stone, and that it is fired at a temperature comparatively not high. He also remarks that the fabrication of figures with this biscuit (if such it may be termed), requires great care and skill, the figures being cast in different parts, the compound in a liquid state, so that the junction of the parts has to receive every attention, while their bulk, in the firing process, diminishes to no less than a quarter of the model. The firing itself also requires great care, props being necessary to the figures, which otherwise would lose their forms. The yellowish-white colour of the body is due to a small quantity of silicate of the peroxide of iron contained in the felspar or clays.

‡ See note, *ante*, p. 22.



of lead. (For these pots, see Plott's Hist. of Staffordshire, chapter 3, sections 23 and 29).

*Coll. Enoch Wood.*

Ce. B. 2.

Another butter pot,  $14\frac{1}{2}$  inches high,  $6\frac{1}{2}$  inches in diameter, of cylindrical form. Broken in part.

*Coll. Enoch Wood.*

Fig. 93.



Ce. B. 3.

Fragment of another butter pot, apparently a cast-away.

*Coll. Enoch Wood.*

Ce. B. 4.

Drinking vessel in the form of a bear. Probably an imitation of similar vessels manufactured in Germany.

*Coll. Enoch Wood.*

Ce. B. 5.

Three-handled tyg, a drinking cup of the time, so handled that three different persons, drinking out of it, and each using a separate handle, brought their mouths to different parts of the rim. Broken.

*Coll. Enoch Wood.*

Ce. B. 6.

Cover of a tyg.

Ce. B. 7.

Another three-handled tyg.

Ce. B. 8.

A jug; handle broken. Mouth narrow. Apparently a castaway.

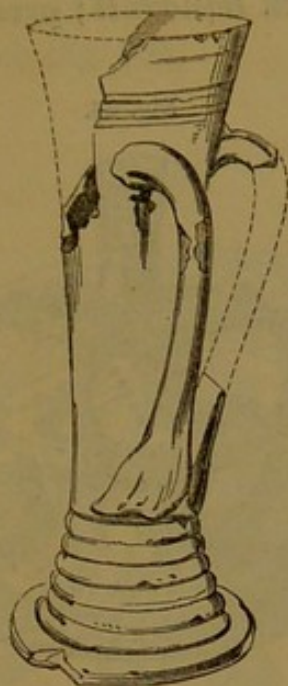
Ce. B. 9.

A two-handled tyg. Handles opposite.



A two-handled tyg. Handles together. Broken. Ce. B. 10.  
Form as annexed (fig. 94).

Fig. 94.



- |  |            |
|--|------------|
| A three-handled tyg. Broken.   | Ce. B. 11. |
| Another three-handled tyg; nearly perfect.   | Ce. B. 12. |
| A three-handled tyg. Large.  | Ce. B. 13. |
| Single-handled mug, with cover.  | Ce. B. 14. |
| A portion of some pipe or vessel, of the same ware and glazing as the tygs; use uncertain; fractured prior to glazing. | Ce. B. 15. |

*Ce. B. 6 to Ce. B. 15., Coll. Enoch Wood.*

Large tyg, with three handles and a spout, ornamented with bosses of darker colour, before glazing, than the body of the tyg; on these bosses, a flower, a spread eagle, and a swan (fig. 95). Ce. B. 16.

*Coll. Bandinel; presented by Dr. Page.*

Fig. 95.





- Ce. B. 17. Candlestick, much the same ware as the tygs, with date of 1649,\* EM, and dots, arranged for pattern, and in white clay dip or barbotine (fig. 96).  
*Coll. Bandinel; presented by Dr. Page.*

Fig. 96.



- Ce. B. 18. Flat flask, with two pierced ears, ornamented with brown and yellow marbling.  
*Coll. Bandinel; presented by Dr. Page.*
- Ce. B. 19. Mug. Brown and white ornaments, in slip, upon a yellow ground. (Fig 97.) Bottom and handle wanting.

Fig. 97.



\* From a partial removal of the white dip or barbotine, prior to glazing, the 6 in this date has been taken for a 5, and consequently, the date supposed to be 1549. A close examination shows the 6. This candlestick has been figured in Marryatt's Porcelain and Pottery, p. 91.



Large dish. Body buff coloured, with ornaments Ce. B. 20. laid on, in relief, in dark and light brown. In the centre a crowned lion. On part of the margin, the name of the maker, THOMAS TOFT, as shown in the annexed sketch (fig. 98).

Fig. 98.



Fragments of a quadrangular dish of similar ware Ce. B. 21. as B. 20. The ornaments are enriched by insertions of brown and red clay. Among them occur the lion and unicorn, and a crowned rose.

*Ce. B. 19.—Ce. B. 21., Coll. Enoch Wood.*

Fragments of the same kind of ware.

Ce. B. 22–27.

Fragment of quadrangular tile. Body red, ornaments in pipe clay glazed. Ce. B. 28.

Porridge mug. Two handles. Nearly black, with pipe clay ornaments. Ce. B. 29.

Pint mug, washed inside with pipe clay, and ornamented outside with the same substance in marbled bands. Ce. B. 30.

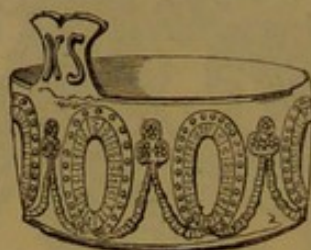
(Mr. Augustus Franks (MS.) mentions that a similar mug, belonging to the Rev. T. Staniforth, Storrs, Windermere, bears the date of 1694).



- Ce. B. 31. Mug. Body, fawn-colour, painted with dark tint, forming a pattern.
- Ce. B. 32. Mug. Fawn-coloured body, painted dark so as to leave spots.
- Ce. B. 33. Fragment of mug, with marbled ornaments in white clay.
- Ce. B. 34. Fawn-coloured ware, painted dark tint. Ornamented by indented pattern. Behind upright handle, K S, in relief (fig. 99).

*Ce. B. 22-34., Coll. Enoch Wood.*

Fig. 99.



- Ce. B. 35. Porringer. Ware, cream-coloured, painted with dark brown spots and bands, partially glazed.
- Ce. B. 36. Porringer. Light-coloured base, mottled all over with brown glaze. Handle broken off.
- Ce. B. 37. Cylindrical mug, turned in bands, and covered by wavy brown glaze. Broken.
- Ce. B. 38. Fragment of a mug similar to the last.
- Ce. B. 39. Small mug, with rounded base. Body light coloured, mottled with brown glaze.
- Ce. B. 40. Similar mug, with speckled glaze.
- Ce. B. 41. Small stone ware mug, of similar form. Lower portion grey, the upper portion a full brown.
- Ce. B. 42. Quart mug. Handle broken off. Body red, glazed. Ornaments in Devon clay, in relief. Among them the Royal arms, a stag, lion, &c.
- Ce. B. 43. Cup and saucer made in a mould. Light red compact body. Ornaments in relief, and coated with Devon clay. The whole glazed.
- Ce. B. 44. Cup, similar to the last, unglazed.

*Ce. B. 35-44., Coll. Enoch Wood.*



*Eler's Ware,\* 1680-1710.*

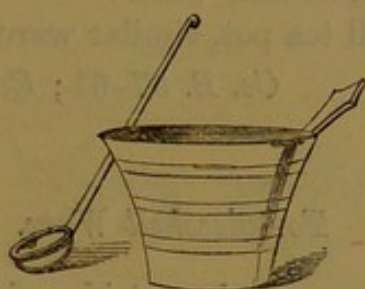
Plain red cup. On the bottom is scratched the Ce. B. 45. number 4.

Red teapot. Chinese ornaments in relief. On the Ce. B. 46. bottom is stamped a stag.

Small red cup, or piggin, with a rising handle, as Ce. B. 47. shown in annexed sketch (fig. 100).

A small red ladle, very neatly formed, as beneath Ce. B. 48. (fig. 101).

Figs. 100 and 101.



A cup, similar to Ce. B. 47, with handle broken off. Ce. B. 49.

A small coffee cup, with pressed pattern in relief Ce. B. 50. (fig. 102).

A small tea cup, plain.

Ce. B. 51.

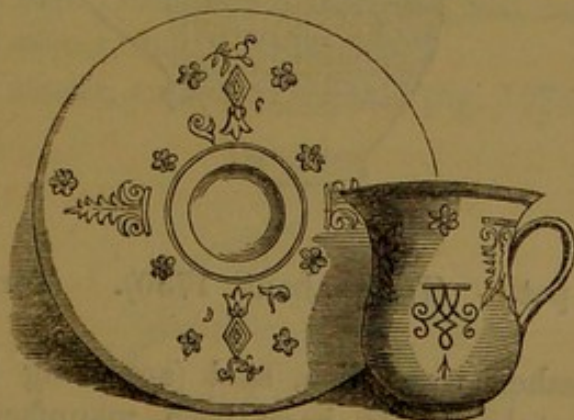
A coffee cup, pattern in relief.

Ce. B. 52.

A saucer, pattern in relief (fig. 103).

Ce. B. 53.

Figs. 102 and 103.



\* Clays employed, those mentioned p. 110.



- Ce. B. 54. Small coffee cup, pattern in relief.  
 Ce. B. 55. Small tea pot, pattern in relief.  
 Ce. B. 56. Small tea pot with cover, pattern in relief. On the bottom a stamped square mark, in imitation of Chinese or Japan ware.

*Ce. B. 45-56 ; Coll. Enoch Wood.*

*Agate Ware.*

- Ce. B. 57. Four knife hafts of agate ware.  
 Ce. B. 58. Coffee pot without cover, same ware.  
 Ce. B. 59. Saucer, same ware.  
 Ce. B. 60. Small tea pot, similar ware.  
 Ce. B. 61. Another small tea pot, similar ware.

*Ce. B. 57-61 ; Coll. Enoch Wood.*

*Tortoiseshell Ware.*

- Ce. B. 62. Tea pot. Open work outside (fig. 104). Glaze, termed tortoiseshell, formed of lead ore and manganese.

Fig. 104.



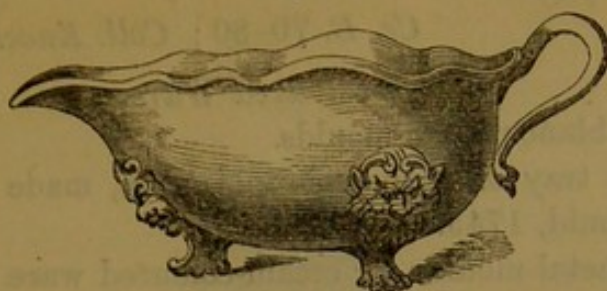
- Ce. B. 63. Coffee pot. (Date about 1750). Tortoiseshell ware.  
 Ce. B. 64. Tortoiseshell ware dish, said (according to Enoch Wood's catalogue) to have been manufactured by Wedgwood.  
 Ce. B. 65. Tortoiseshell ware plate.  
 Ce. B. 66. Another tortoiseshell ware plate.  
 Ce. B. 67. Half a tortoiseshell ware octagonal dish.



Tortoiseshell ware butter boat (fig. 105).

Ce. B. 68.

Fig. 105.



Tortoiseshell ware bowl, the outside moulded in Ce. B. 69. relief, and the ornaments gilt (fig. 106).

*Ce. B. 62-69; Coll. Enoch Wood.*

Fig. 106.



*Drab-coloured Ware.*

Large tea pot with cover, embossed ornaments in Ce. B. 70. white.

Two flower pots and stands, embossed. Ornaments white. Ce. B. 71 & 72.

Cream jug. Date about 1740-50. Turned on the lathe before ornamenting. *Devon clay with Staffordshire sand.* Ce. B. 73.

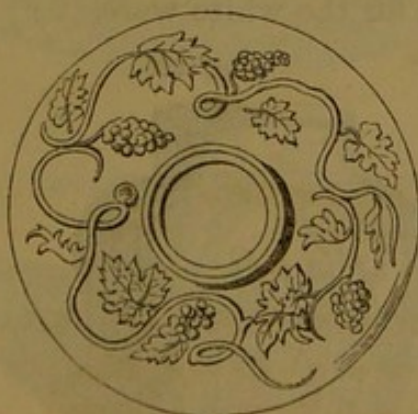
Quart jug. Similar manufacture and date. Ce. B. 74.

Coffee cup. Similar manufacture and date. Ce. B. 75.

Small saucer, embossed inside. Ce. B. 76.

Small saucer, embossed outside (fig. 107). Ce. B. 77.

Fig. 107.





- |            |                                 |                 |
|------------|---------------------------------|-----------------|
| Ce. B. 78. | Small basin.                    | } Date 1740-50. |
| Ce. B. 79. | Small basin. Outside in relief. |                 |
| Ce. B. 80. | Cream jug.                      |                 |

*Ce. B. 70-80; Coll. Enoch Wood.*

*Cream-coloured Ware.*

- Ce. B. 81, 82, and 83. Small blanc-mange moulds.
- Ce. B. 84. Pickle tray of cream-coloured ware, made from a metal mould, 1745.
- Ce. B. 85 & 86. Two metal moulds for cream-coloured ware.
- Ce. B. 87. Bowl: cream-coloured inside, brown outside. Pattern, inside, lions and fishes scratched through the white coating of Devon clay by a point, and then glazed. Date 1755.
- Ce. B. 88. Mug (half-pint) of cream-coloured ware, with G. R., and pattern scratched by a point, and tinted blue.

*Ce. B. 81-88; Coll. Enoch Wood.*

*White Ware.*

- Ce. B. 89. Small bowl, moulded on pattern.
- Ce. B. 90. Small mug, moulded on pattern.
- Ce. B. 91. Large bowl, moulded on pattern (fig. 108).

Fig. 108.



- Ce. B. 92. Example of a mould, in relief on strong ware (fig. 109), whence plaster of Paris moulds, in depression, were obtained for the white ware.

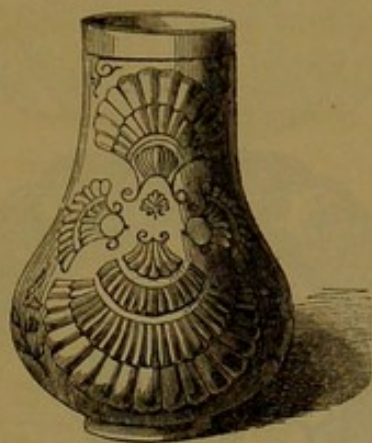
Fig. 109.





Other moulds of the like character. Ce. B. 93 Ce. B. 93 & 94, (fig. 110), that for a jug, and Ce. B. 94, one for the lid of a pot.

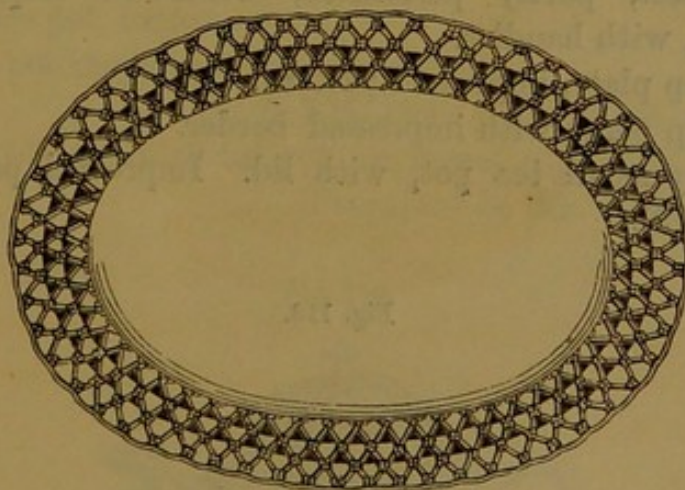
Fig. 110.



Basket, perforated and pressed on a mould. One Ce. B. 95. handle broken.

Dish (fig. 111). The rim perforated and pressed on Ce. B. 96. a mould. Centre plain.

Fig. 111.



Soup dish. Border pressed on a mould. Centre Ce. B. 97. plain.

Dishes, with pressed borders.

Oval dishes, pressed throughout inside.

Small oval dish, broad border impressed.

*Ce. B. 89-104; Coll. Enoch Wood.*

Ce. B. 98, 99,  
100 and 101.

Ce. B. 102 & 103.

Ce. B. 104.



- Ce. B. 105. Plate, impressed border. Early example of transfer of engraving upon glaze. Design, young man and girl with grapes.
- Ce. B. 106. Another impressed plate, showing early transfer from an engraving, in red, upon the glaze. Design, lion and fox (fig. 112).

Fig. 112.



- Ce. B. 107. Round deep plate, impressed inside throughout.
- Ce. B. 108. Basket, partly perforated, otherwise impressed inside, with handles.
- Ce. B. 109. Deep plate, impressed pattern.
- Ce. B. 110. Soup plate, with impressed border.
- Ce. B. 111. Very small tea pot, with lid. Impressed pattern (fig. 113).

Fig. 113.



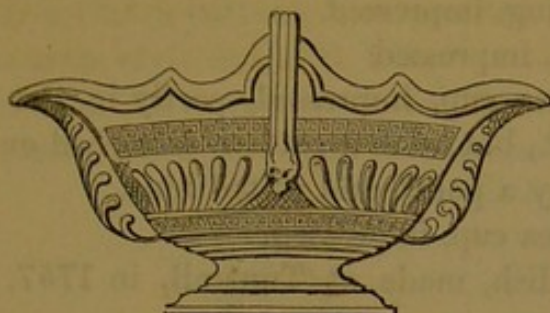
- Ce. B. 112 & 113. Coffee cups, impressed.
- Ce. B. 114. Very small tea pot, impressed.



Double-handled butter bowl (fig. 114).

Ce. B. 115.

Fig. 114.



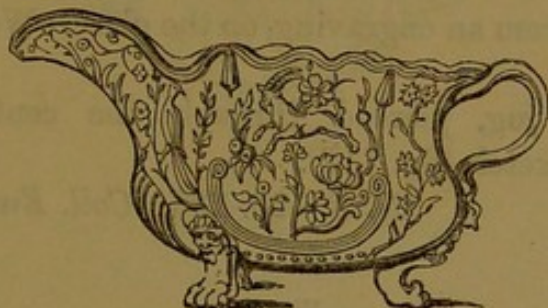
Small heart-shaped tea pot.

Ce. B. 116.

Butter boat, impressed (fig. 115).

Ce. B. 117.

Fig. 115.



Small butter boat, impressed.

Ce. B. 118.

Coffee pot, impressed.

Ce. B. 119.

Tea pot impressed, impressions gilt.

Ce. B. 120.

*Ce. B. 105-120; Coll. Enoch Wood.*

Four-lobed small tea pot, impressed (fig. 116).

Ce. B. 121.

*Presented by Mr. L. Martin.*

Fig. 116.



Small basin, impressed. General design, as if Ce. B. 122.  
copied from a German pattern; in the compartments



- armorial bearings, double-headed eagle, swan, cupid on a lion, English kettle on a (coal) grate, &c.
- Ce. B. 123. Plain, well-formed bottle.
- Ce. B. 124. Cream jug, impressed.
- Ce. B. 125. Tea pot, impressed.
- Ce. B. 126. Small tea cup, impressed, partly in the manner of Ce. B. 122., but with a pattern scratched outside, near the rim, by a point, and tinted blue.
- Ce. B. 127. Small tea cup, impressed.
- Ce. B. 128. Large dish, made at Tunstall, in 1757, by Enoch Booth.
- Ce. B. 129. Plate, painted in blue (cobalt) beneath the glaze, in the manner of some Delft ware. Pressed border.
- Ce. B. 130. Small dish, partly pressed, with perforated sides.
- Ce. B. 131. Basket, pressed in mould, perforated sides.
- Ce. B. 132. Small canister, white ware, an early example of printing, from an engraving, on the glaze. Wedgwood's mark.
- Ce. B. 133. Puzzle jug, pierced through the centre, as in annexed sketch (fig. 117).

*Ce. B. 123-133; Coll. Enoch Wood.*

Fig. 117.



- Ce. B. 134. Cream-coloured ware tea pot, with fruits, printed coarsely.
- Ce. B. 135. Another tea pot of the same ware, coarsely painted, with flowers on one side, and lady, in costume of the time, on the other.



Candlestick, moulded, and partly tinted in blue (cobalt). Ce. B. 136.

Tea caddy, open work, upon solid sides. Ce. B. 137.

Jug, after a Dutch pattern, and painted in (cobalt) blue, in the same style as Ce. B. 129. Ce. B. 138.

Stand for a basket, painted in cobalt blue. Ce. B. 139.

Bust of Shakespeare (fig. 118), painted in colours. Ce. B. 140.

Fig. 118.



Bust of Shakespeare, in black Egyptian ware, from the same mould. Ce. B. 136-141; *Coll. Enoch Wood*. Ce. B. 141.

Bust of Madonna (probably from some Italian model), (fig. 119), of the same ware, and painted in the same manner as the bust of Shakespeare, Ce. B. 140. Ce. B. 142.

Fig. 119.



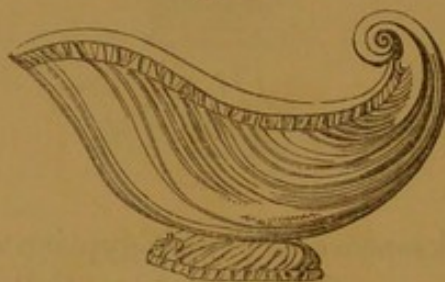


- Ce. B. 143. Birds (pigeons) in a nest, painted in colours.  
 Ce. B. 144. Leaf, with fruit, painted.  
 Ce. B. 145. Bowl, coloured agate or marbled pattern outside.  
 Ce. B. 146. Cream jug, coloured buff outside, with embossed work, painted blue.  
 Ce. B. 147. Moulded small cup, Queen's ware.  
*Ce. B. 144-147; Coll. Enoch Wood.*  
 Ce. B. 148. Tea cup, Queen's ware, with twisted handle, design painted in claret colour, over the glaze.  
 Ce. B. 149. a. & b. Cup and saucer, with transfer from engraving, in black, over the glaze.

*Wedgwood's Ware. (1759-95).*

- Ce. B. 150. Butter boat, Queen's ware (fig. 120). Made at Wedgwood's Bell Works. Early specimen.  
*Ce. B. 148-150; Coll. Enoch Wood.*

Fig. 120.



- Ce. B. 151. Cup and saucer, Queen's ware, painted with autumnal leaves, and edged with red lines. Wedgwood's mark (early work).  
*Coll. Bandinell; presented by Dr. Page.*  
 Ce. B. 152. Dish, Queen's ware, painted with rose, jasmine, and convolvulus, in dark lilac. Wedgwood's mark.  
 Ce. B. 153. Plate of the same kind, unmarked.  
 Ce. B. 154. Small oval dish, painted with brown star-like figures, crossed with gold. Dark flesh colour border. Wedgwood's mark.  
 Ce. B. 155. Desert dish, in the form of a large pecten-valve, tinted to resemble nature. Wedgwood's mark.  
 Ce. B. 156. Desert dish, in the form of a pholas-valve, tinted to resemble nature. Wedgwood's mark.  
 Ce. B. 157. Plate with dog-tooth violet painted upon it. Attributed to Wedgwood.  
*Coll. Bandinell; presented by Dr. Page.*  
 Ce. B. 158. Small open work basket (Queen's ware). Wedgwood's mark.



Cup and saucer of black Egyptian ware. Cup painted with border in white and red. Red line round base. Wedgwood's mark. Ce. B. 159.

Tea cup and saucer, black Egyptian ware, ribbed pattern. Wedgwood's mark. Ce. B. 160.

Two-handled, bottle-form vase, in black Egyptian ware. Wedgwood's mark. Ce. B. 161

Vase, two-handled, in black Egyptian ware. Medallion on one side, three graces. Mark, Wedgwood and Bentley, Etruria. Ce. B. 162.

Tazza, after Greek form, in black Egyptian ware. Wedgwood's mark. Ce. B. 163.

Large vase, in black Egyptian ware, handle formed by the figure of a satyr, looking into the vase (fig. 121). Wedgwood's mark. Ce. B. 164.

Fig. 121.



Coffee pot, in black Egyptian ware; ribbed pattern, without cover. Wedgwood's mark. Ce. B. 165.

Vase, in black Egyptian ware. Handle, a dolphin's tail. Mask in front. Mark, Wedgwood and Bentley, Etruria. Ce. B. 166.

Vase, in black Egyptian ware (fig. 122). Support, three large figures. Three other small figures, seated Ce. B. 167.



on the cover, palm top. Triangular base. Wedgwood's mark.

Fig. 122.



- Ce. B. 168. Large tazza-formed vase, in Egyptian black ware, with two handles. Embossed band of olive leaves and grapes, in red. Base with red embossed ornaments. The whole arranged for holding flowers. Wedgwood's mark.
- Ce. B. 169. Goblet, in black Egyptian ware. A medallion in front, cracked in the firing. Mark of Wedgwood and Bentley (about 1767).
- Ce. B. 170. Two-handled vase, in black Egyptian ware, slightly painted in red, in lines of Greek form, occasionally picked out with white. Dancing figure on the chief face. Wedgwood's mark.
- Ce. B. 171. Two-handled, small vase, in black Egyptian. Wedgwood's mark.
- Ce. B. 172. Large, two-handled vase, in black Egyptian ware, with cover, painted in red and white, in imitation of Greek vases. Wedgwood's mark.
- Ce. B. 173. Large mug, in black Egyptian ware. Boys, with



head of stag and dog, embossed. Silver rim. Wedgwood's mark.

Large, elegantly formed vase (fig. 123), in black Egyptian ware. Ce. B. 174. Figures in relief. Two handles, serpents' heads; cover crowned by a pegasus. Wedgwood's mark.

Fig. 123



Jug, with cover, in black Egyptian ware. Wedgwood's mark. Ce. B. 175.

Sphinx. A statuette in black Egyptian ware. Without mark. Ce. B. 176.

Vase, in black Egyptian ware, with two handles, formed of serpents twisted round human necks. Female figure, with cupid, embossed. Without mark. Ce. B. 177.

Coffee pot, in black Egyptian ware, ribbed pattern. With cover. Wedgwood's mark. Ce. B. 178.



Ce.B.179 & 180. Chimæras (two), in black Egyptian ware, with nozzles for lights (fig. 124). Wedgwood's mark.

Fig. 124.



- Ce. B. 181. Two-handled tea cup and saucer, white ware, gold edgings. Wedgwood's mark.
- Ce. B. 182. Small vase and cover, in white ware, inside only glazed. Wedgwood's mark.
- Ce. B. 183. Small vase, in jasper ware. Handles, horned heads, gilt. Mark, Wedgwood and Bentley.
- Ce. B. 184. Small vase. Light blue body, with white figures in relief. Children on one side, kneeling figure on the other. Base, added, formed of polished ware, marked Turner.
- Ce. B. 185. Larger vase. Light blue body, with white figures in relief. Two handles, at the base of each the mask of a lion. Figures, children with grown female. Cover wanting. Wedgwood's mark.
- Ce. B. 186. Vase, with cover. Light blue body, with white figures in relief. Some of the relief, masks and musical instruments, in blue. Cover, with pegasus at the top. Wedgwood's mark.
- Ce. B. 187. Vase, with two handles. White ware, speckled with grey, bearing impressed figures, handles, and a band of laurel in relief. Black base, added, with mark of Wedgwood and Bentley.
- Ce. B. 188. Tea pot. Red jasper ware, with embossed figures, in black Egyptian. Cover surmounted by a crocodile. Wedgwood's mark.



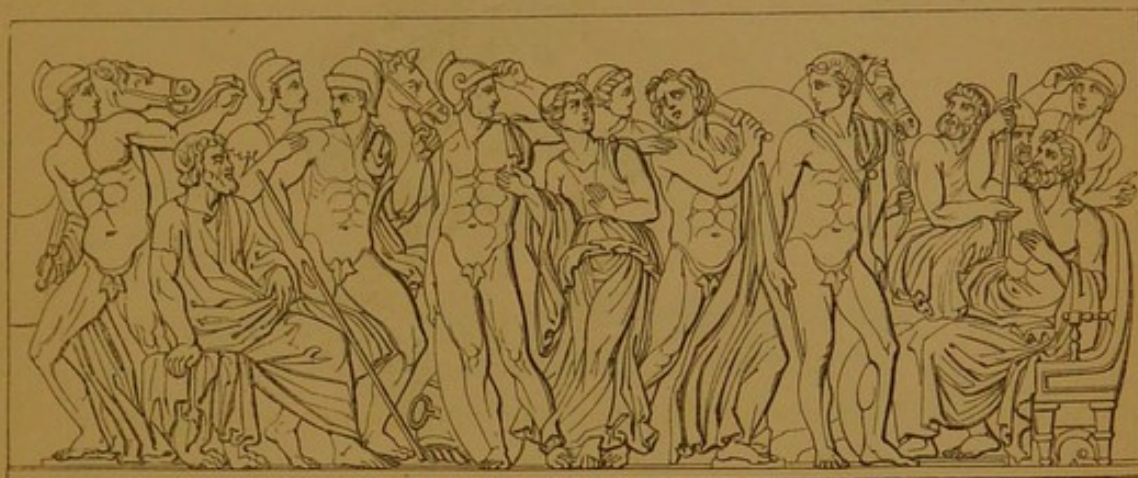
Small tazza, two-handled, in buff ware, with flower holding top. Raised, Greek, ornament in dull green. Wedgwood's mark. Ce. B. 189.

Teapot, in buff ware. Pattern impressed. Wedgwood's mark. Ce. B. 190.

Oval-shaped cup, in buff ware. Impressed basket pattern. Wedgwood's mark. Ce. B. 191.

Large plaque, illustrative, on the large scale, of the cameo ware of Wedgwood, worked upon flat surfaces. Ce. B. 192.

Fig. 125.



The body is of a greenish tint, supporting figures in relief, in white. The design is by Flaxman, who executed many for Wedgwood (fig. 125). Wedgwood's mark.

Several examples (13) of the execution of Wedgwood's cameo ware on flat surfaces. Ce. B. 193.

Large vase, 27 feet 7 inches high, and 4 feet 8 inches in circumference. A copy of a painted Greek vase in the British Museum, and the largest work executed by Wedgwood. For form and design see frontispiece. Ce. B. 193, a.

*Presented by Apsley Pellatt, M.P.*

A small canister in Queen's ware, early printed, probably at Liverpool. Mark, Wedgwood. Ce. B. 193, b.

Oval plaque, in black Egyptian ware, with a female figure in relief. Staffordshire, but uncertain as to manufacture. Ce. B. 194.

### *Spode's Ware.*

Covered vase. Body red, with black ornaments, of Grecian character, in relief. Spode's mark. Ce. B. 195.



- Ce. B. 299. Small two-handled vase. Body red, with white figures in relief. Spode's mark.
- Ce. B. 197. Small basket. Body yellowish, with black arabesque flowers in relief. Spode's mark.
- Ce. B. 198. Vase, with perforated cover, on a tripod stand, formed by three dolphins (fig. 126). Body red, with black ornaments in relief. Spode's mark.

Fig. 126.



- Ce. B. 199. Basket and plate, of white perforated ware, with leaves, &c., painted in green and blue. Spode's mark.
- Ce. B. 200. Tea pot, of yellowish ware, with green arabesque pattern in relief. Spode's mark.
- Ce. B. 201. Small basin, with cover, of white ware, with blue ground, and flowers in black.
- Ce. B. 202. Basket for flowers. White body, painted brown, with white border, and figures in relief. Spode's mark.
- Ce. B. 203. Inkstand. Body brown, with white border in relief. Spode's mark.
- Ce. B. 204. Inkstand. Body dark brown. Bird's heads for handles. Spode's mark.
- Ce. B. 205. Tea pot. Same kind of ware as Ce. B. 203. Basket work pattern. Spode's mark.
- Ce. B. 206. Small porcelain bottle. Body white. Chinese figures, &c., painted in colours. Marked, "Spode Felspar Porcelain."
- Ce. B. 207. Porcelain vase, on four legs, painted with flowers. Marked, in red, "Spode."



Porcelain two-handled vase. Bleu de roi and gold Ce. B. 208.  
matted ground, painted with flowers. Marked, in red,  
"Spode, 1166."

*The above collection of Spode's ware, Ce. B. 195–  
208 presented by Mr. Battam.*

Two-handled covered coffee cup and saucer, painted Ca.B.209 & 210.  
in landscape, and gilt. Mark, in red, "Longport."

### *Various Wares of Later Dates.*

Coffee cup and saucer, painted with flowers. Blue Ce. B. 211.  
and gold, raised border. Marked, in red,  $\frac{3}{8}$ .

White, fine earthenware basin and ewer, with gilt Ce.B.212 & 213.  
borders. Marked, Copeland and Garrett, with crown  
and wreath.

Porcelain door plate, painted in the style of Watteau, Ce. B. 214.  
with gilt borders. C. and G.\*

Another porcelain door plate, painted with flowers. Ce. B. 215.  
C. and G.

Earthenware plate, with landscape and arabesque Ce. B. 216.  
border painted in brown. C. and G. "New blanche."

Earthenware plate, with blue border. C. and G. Ce. B. 217.  
"Saxon blue."

White porcelain plate. C. and G. Ce. B. 218.

Porcelain plate. Border, wreath of calceolaria. Ce. B. 219.  
Copeland's mark. *Presented.*

Porcelain plate. Armorial bearings, in centre, in Ce. B. 220.  
gold. Raised border in maroon and gold. C. and G.

Porcelain plate, with wreath of flowers for a border. Ce. B. 221.  
C. and G.

Porcelain plate, with painted flower border, and Ce. B. 222.  
peaches for centre. Copeland's mark. *Presented.*

Doubled-handled cup and saucer. Turquoise blue Ce. B. 223.  
ground with flowers, gilt handle. C. and G.

Circular panel of flowers in biscuit, frame of por- Ce. B. 224.  
celain, painted pink, and gilt. C. and G.

Porcelain slab, with painted flowers. C. and G. Ce. B. 225.

Three small porcelain slabs painted. C. and G. Ce. B. 226.

White porcelain cup and saucer. C. and G. Ce. B. 227.

Porcelain cup and saucer, painted with turquoise Ce. B. 228.  
blue border and loops of flowers. C. and G. *Presented.*

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\* The letters C. and G. refer to the manufacture of Copeland and Garrett, successors to Spode.



- Ce. B. 229. Porcelain cup and saucer, gilt. C. and G.
- Ce. B. 230. Porcelain cup and saucer, painted with *bleu de roi* ground and flowers. C. and G. *Presented.*
- Ce. B. 231. Porcelain cup and saucer, painted with turquoise blue ground and fruit. C. and G.
- Ce. B. 233. Porcelain cup and saucer, with painted border of heath. C. and G., 8,350.
- Ce. B. 234. Porcelain vase, painted cream-coloured ground with flowers, a gilt handle. C. and G.
- Ce. B. 235. Porcelain ornament, painted green ground surmounted with a rim of basket work. C. and G.
- Ce. B. 236 & 237. Porcelain door handles, painted. C. and G.
- Ce. B. 238, 239, and 240. Two oblong and one circular shaped porcelain panels, intended for door panels, painted with flowers and subjects after Watteau. C. and G.
- Ce. B. 241. Square porcelain panel, painted light green ground and flowers. C. and G.
- Ce. B. 242. Porcelain panel, painted with flowers. C. and G.
- Ce. B. 243. Porcelain panel, painted blue ground with white flower border. C. and G.
- Ce. B. 244. Porcelain panel, painted light pink ground with compartments of flowers. C. and G.
- Ce. B. 245. Porcelain panel, painted with landscapes. C. and G.
- Ce. B. 246. Porcelain panel, painted with orchideous flowers. C. and G.
- Ce. B. 247. Porcelain panel, painted with an Alhambra pattern. C. and G.
- Ce. B. 248. Porcelain panel, with painted tile pattern. C. and G.
- Ce. B. 249. Framed panel, composed of separate tiles upon which the subject has been painted and then burnt in.\* Manufactured by H. Minton and Co.
- Ce. B. 250. Porcelain plate, the centre and border painted with flowers. M.†
- Ce. B. 251. Porcelain plate, the centre and border painted with flowers. M.
- Ce. B. 252. Porcelain plate, with centre and border painted with flowers. M., with "Felspar China."
- Ce. B. 253. Porcelain plate, painted with a border of turquoise blue and compartments of birds, with centre of birds. M.

\* A new process by Mr. B. E. Duppa, of whom honourable mention was made in the Jury Reports of the Great Exhibition of 1851, for this specimen.

† The letter M in the following portion of the Staffordshire series, refers to the manufacture of Minton and Co.



Porcelain plate, with printed border of passion flower. Various marks of Minton and Co. Ce. B. 254.

Porcelain plate, painted with spotted blue, and gilt border and compartments of flowers. No mark. Ce. B. 255.

Porcelain plate with perforated rim, painted with turquoise blue, and centre of cupids. M. Ce. B. 256.

Porcelain plate, painted with a spotted green border and a centre of flowers. M. Marked in red, 7,663. Ce. B. 257.

Four perforated earthenware stove tiles. Painted. M. Ce. B. 258, 259, 260, and 261.

Two coloured encaustic tiles, the pattern forming part of a running border. M. Ce. B. 262 & 263.

Encaustic tile. M. Ce. B. 264.

Nine encaustic tiles, forming a pattern in a square. M. Ce. B. 265 to Ce. B. 272.

Two encaustic tiles of two colours. M. Ce. B. 273 & 274.

Two encaustic tiles of three colours. M. Ce. B. 275 & 276.

Larger size encaustic tile of four colours. M. Ce. B. 277.

Encaustic tile with four colours. M. Ce. B. 278.

Encaustic tile with three colours. M. Ce. B. 279.

Four encaustic tiles with five colours, forming a pattern. M. Ce. B. 280 to 283.

Encaustic tiles with three colours, forming a pattern for a running border. M. Ce. B. 284 & 285.

Encaustic tile of two colours. M. Ce. B. 286.

A series to illustrate the mode of producing tiles of different patterns and colours. M. Ce. B. 287 to Ce. B. 291.

Six various coloured roofing tiles. M. Ce. B. 292 to Ce. B. 297.

Cream-coloured tiles impressed with geometric pattern. M. Ce. B. 298 to Ce. B. 301.

Red earthenware tile of different shape. M. Ce. B. 302.

Cream-coloured earthenware tile. M. Ce. B. 303.

Small cream-coloured earthenware tiles of Gothic pattern. M. Ce. B. 304.

Slate-coloured tiles with geometric pattern. M. Ce. B. 305.

Red earthenware tile. M. Ce. B. 306.

Black earthenware tile. M. Ce. B. 307.

Blue earthenware tile, impressed with a diamond pattern and white flowers. M. Ce. B. 308.

Tile, various colours. M. Ce. B. 309.

Tile, maroon-coloured, with geometric pattern. M. Ce. B. 310.

Tile, various colours. M. Ce. B. 311.

Tiles, blue printed. M. Ce. B. 312, 313, 314.



- Ce. B. 315. Tiles (4), forming a pattern, blue printed. M.
- Ce. B. 316. Tile, blue printed. M.
- Ce. B. 317. Pounded dry clay, employed in the manufacture of tesserae for tessellated pavements, by Prosser's patent process.
- Ce. B. 318. Three boxes of variously coloured tesserae, made by the above process. In the centre of the entrance hall of the Museum is an example of a tessellated pavement from a design founded on a Roman tessellated pavement discovered at Woodchester, Gloucestershire. This pavement was executed by Messrs. Minton and Co., with tesserae of their manufacture.
- Ce. B. 319. Pestle and mortar for chemical purposes, in hard porcelain. M.
- Ce. B. 320. Evaporating dish for chemical purposes, in hard porcelain. M.
- Ce. B. 321. Perforated basket and dish of earthenware, with the Chinese willow pattern, printed in blue. One of the earliest examples of the printing of that pattern. M.
- Ce. B. 322. Porcelain mug, printed on the glaze by transferring the print, first, from the copper plate on to gelatine, then from the gelatine on to the porcelain, previously fired. After the porcelain has received the print, which is merely of thick tar, it is dusted with the enamel powder, which sticks to the tar, and it is then again fired.  
*Presented by Mr. Minton.*

*The following specimens of Staffordshire Porcelain and Pottery are from the Great Exhibition of 1851.*

- Ce. B. 323. Cup and saucer in thin porcelain. Pink (rose du Barri) ground, with painted flowers and fruit, gilt. Minton's mark.
- Ce. B. 324. Earthenware plate, with maroon-coloured border, gilt.
- Ce. B. 325. Earthenware plate, painted. Marked with a coat of arms, and "Earthenware."
- Ce. B. 326. Earthenware plate, the centre painted with roses. Marked C. Meigh and Sons, Earthenware.

*Ce. B. 324, 325, 326, and 350 are specimens of painting on earthenware, manufactured by C. Meigh and Sons.*



Porcelain plate, with bright orange-coloured border. Ce. B. 327.  
The colour produced by chromate of lead.

*Presented by Messrs. Ridgway and Co.*

Earthenware slab in the form of a framed picture. Ce. B. 328.  
A transfer in colours under the glaze. Subject, Mulready's Village Schoolmaster. Marked, F. and R. Pratt and Co., Fenton, Staffordshire.

Lustre earthenware plate. The effect produced by Ce. B. 329.  
a very thin surface of metallic platinum.

*Presented by Mr. Robert Warrington.*

Porous earthenware wine-cooler, embossed with Ce. B. 330.  
bacchanalian figures. Manufactured by Meigh and Sons.

Portland vase in statuary porcelain. Manufactured Ce. B. 331.  
by Alderman Copeland.

Small two-handled cup in Parian, a copy of one in Ce. B. 332.  
silver in the Museo Borbonico, Naples, found at Pompeii. Manufactured by Minton and Co.

Small two-handled cup in Parian, with ivy leaf Ce. B. 333.  
border. Manufactured by Minton and Co.

Wine-cooler with rams-head handles, coloured Ce. B. 334.  
majolica, with painted cupids on each side. Manufactured by Minton and Co.

Bust of Lady Clementina Villiers, by M'Donald, in Ce. B. 335.  
statuary porcelain.

*Manufactured and presented by Alderman  
Copeland.*

Large vase and stand (fig. 127), dark blue ground, Ce. B. 336.  
ornamented with figures in relief, in white. Manufactured by Wedgwood and Sons.

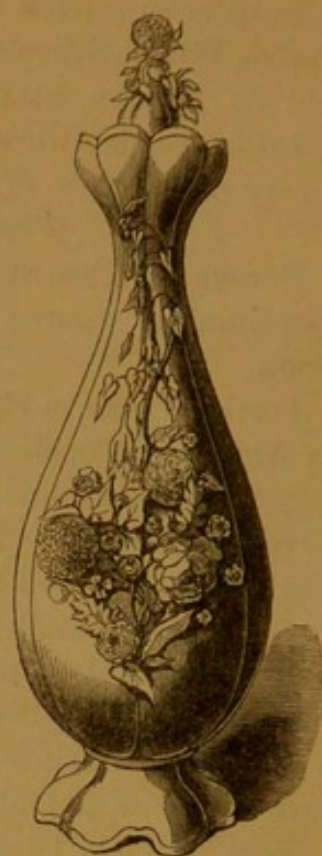
Large vase, in Parian, ornamented with flowers in Ce. B. 337.  
high relief (fig. 128). Manufactured by Messrs. T. and R. Boote, Burslem.



Fig. 127.



Fig. 128.



- Ce. B. 338. Porcelain vase, bleu de roi colour, jewelled and gilt, after an old Sèvres model. Manufactured by Minton and Co.
- Ce. B. 339. Statuette in Porcelain. Innocence, by J. H. Foley, R.A.  
*Manufactured and presented by Alderman Copeland.*
- Ce. B. 340. Cellini vase and stand, in Parian, gilt. Manufactured by Minton and Co.
- Ce. B. 341. Porcelain vase, beaded, turquoise ground. Cupids, in compartments, painted in pink. Manufactured by Minton and Co.
- Ce. B. 342. Porcelain vase, rose ground, chased gold panels, painted with musical emblems and flowers. Manufactured by Alderman Copeland.



Wine-cooler in porous earthenware (fig 129) Manufactured by Minton and Co. Ce. B. 343.

Fig. 129.



Porcelain bottle, royal blue ground, jewelled in enamel and gilt. Manufactured by Alderman Copeland. Ce. B. 344.

Single-handed porcelain vase, gilt and painted with landscapes. The ground of a colour called Queen's. Manufactured by Alderman Copeland. Ce. B. 345.

Bust of Juno, after the antique, in statuary porcelain (fig 130). Manufactured by Alderman Copeland. Ce. B. 346.

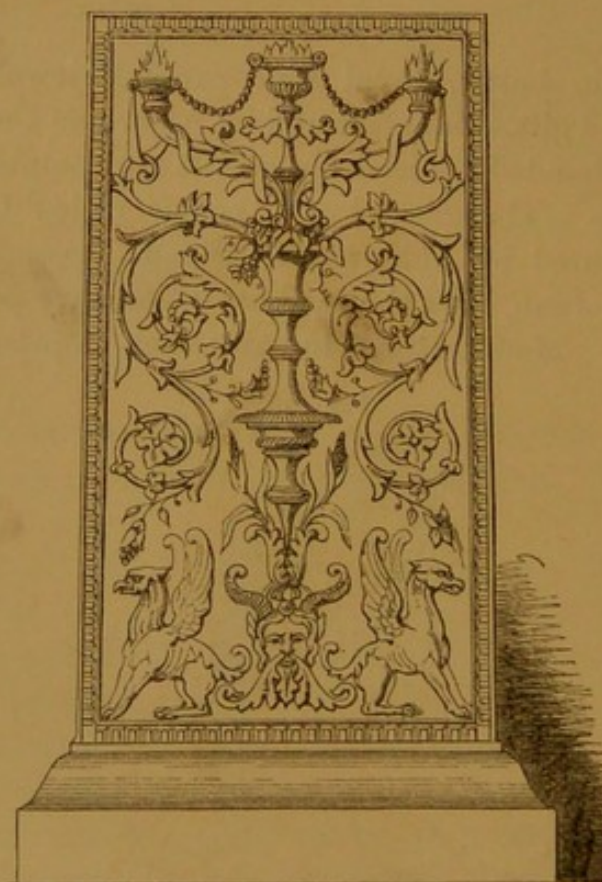
Fig. 130.





- Ce. B. 347. Statuette, in Parian. Dorothea; by John Bell. Manufactured by Minton and Co.
- Ce. B. 348. Statuette, in porcelain. Narcissus; by John Gibson, R.A.  
*Manufactured and presented by Alderman Copeland.*
- Ce. B. 349. Parian bracket, with groups of children. Manufactured by Minton and Co.
- Ce. B. 350. Earthenware vase, painted and gilt. Manufactured by Meigh and Son.
- Ce. B. 351. A square pedestal of perforated enamelled bricks. Cupid and Pandean pipes. Manufactured by Minton and Co.
- Ce. B. 352. A pedestal of perforated enamelled bricks (fig. 131.) Manufactured by Minton and Co.

Fig. 131.



- Ce. B. 353. Another pedestal of similar enamelled bricks, painted with fruit and flowers. Manufactured by Minton and Co.



Four friezes, painted in various colours, after the style of the Luca della Robbia ware, (Ce. B. 354 *a* and *b*—fig. 132.) Manufactured by Minton and Co. Ce. B. 354, *a*, *b*, *c*, *d*.

Fig. 132.



A slab containing thirty-six painted tiles, framed. Ce. B. 355.  
Manufactured by Minton and Co.

Large figure of Galatea in terra-cotta, (fig. 133.) Ce. B. 356.  
*Presented by Minton and Co.*

Fig. 133.





- Ce. B. 357. Earthenware flowerpot and stand. Majolica. Turquoise ground, coloured festoons and heads, and handles of rams' heads. Manufactured by Minton and Co.
- Ce. B. 358, Various specimens of ornamental earthenware, applied to the decoration of rooms and other architectural purposes.  
a, b, c, d.

*Presented by Messrs. Bowers, Challinor, and Wooliscroft.*

#### FULHAM POTTERY.

According to Faulkner (History of Fulham), a pottery was established at Fulham, in 1684, by Mr. John Dwight, of Oxfordshire (who had been Secretary to three successive bishops of Chester), for pitchers, named "white gorges," and several kinds of stone wares, among others, imitations of Cologne ware.

The museum does not contain any specimen from this pottery in its collections.

#### BOW PORCELAIN.

The date of the establishment of the Bow Porcelain Works is not well known. It probably took place about the same time that those of Chelsea rose into importance. We learn from a writing in the cover of a box in the British Museum, containing a porcelain bowl, that the Bow manufactory was somewhat extensive about 1760. The writer, who was the enameller of the bowl, and signs his name, T. Craft, 1790, informs us that "the above manufactory was carried on many years under the firm of Messrs. Crowther and Weatherby, whose names were known almost over the world; they employed about 300 persons; about 90 painters (of whom I was one) and about 200 turners, throwers, &c. were employed under one roof." The building, stated to have been erected on the model of one at Canton, was heated by two stoves on the outside, heat being conveyed into the building by means of flues, and represented as being sometimes "unbearable in winter." Mr. Craft adds that the works were then (1790) used as a turpentine manufactory, that Mr. Weatherby had been dead many years, and Mr. Crowther was in Morden College, Blackheath, he being "the only person of all those



employed there (the porcelain manufactory) who annually visit him." We further learn from this curious document, for a copy of which we are indebted to Mr. Augustus W. Franks, that the bowl, above mentioned was made at the Bow works about the year 1760, that it was painted by Craft in the "old Japan taste, a taste at that time much esteemed by the then Duke of Argyle," that there was near two pennyweights of gold, value fifteen shillings, upon the bowl, that he had bestowed about two weeks' work upon it during three months, and that "it could not have been manufactured for less than 4*l*." As he further mentions that he took the bowl "in a box to Kentish Town, and had it burned there in Mr. Gyles' kiln, cost me 3*s*.," it may be inferred that pieces of the Bow porcelain were purchaseable by the painters or enamellers employed, their work being fired for them where they chose.\*

The marks for this porcelain are considered to be a triangle impressed on the body, and the figure of a bee is mentioned as being often embossed or painted on the Bow porcelain. The works were probably discontinued about 1765—1767.

Small porcelain tea pot. White ground with painted insects and flowers. Ce. C. 1.

Small porcelain basin. White ground with painted butterflies and insects. Ce. C. 2.

A moulded porcelain cream jug. White ground and raised figures of goats. Ce. C. 3.

Similar jug to Ce. C. 3, but with the figures painted. It has also a figure of a bee upon it, in relief. Ce. C. 4.

*These specimens all have a triangle impressed on them, and were presented by Dr. Page from the Bandinell collection. Ce. 3 and Ce. 4 were formerly in the Strawberry Hill Collection.*

#### CHELSEA PORCELAIN.

As previously mentioned (p. 15), the date of the commencement of the Chelsea Porcelain Works is not well known. The notice of Martin Lister, of porcelain

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\* This bowl seems to have been held in great honour by Craft. He says, "I never use it but in particular respect to my company, and I desire my legatee (as mentioned in my will) may do the same."



being there made in 1698, seems to apply to the opaque glass then manufactured at Chelsea. At the same time it is useful as probably pointing to the origin of the porcelain works there established, it being well known that pounded glass entered into the composition of the earlier, so called, porcelains of Chelsea. From a manufactory of glass being established at Chelsea by some Venetians, under the auspices of the Duke of Buckingham, in 1676, the making of opaque glass would be well understood, and it might have happened that a transition was effected from this manufacture, through that of pounded glass, sand and clay, to the porcelain subsequently made, when the Elers, retiring from Staffordshire in 1720, joining this establishment, may have aided the advance of the porcelain works. Be this as it may, the manufacture of Chelsea porcelain became one of importance in 1745, since the company, which at that time desired the exclusive privilege of establishing a porcelain manufactory at Vincennes (subsequently that of Sèvres), urged the benefit that France would gain by having works which should exclude the German and English porcelain.

While the sand for the Chelsea porcelain was obtained from the Isle of Wight (p. 15), and perhaps some of the clay also, it may easily have happened that the clays of Poole, Dorset, were also employed. These clays were then well known (p. 5), and would scarcely be neglected by the Chelsea manufacturers. The supposition that kaolin was actually imported from China for these works does not appear to be well founded. It is one which may have originated from the importation of plain porcelain from China to be enamelled at Chelsea.


The Chelsea works were especially patronised by George II. who procured models, workmen, and even materials from Saxony and Brunswick for them.\* The period of the greatest excellence of the Chelsea porcelain is considered to have been between 1750 and 1765, and there was then so much demand for it, that dealers are described as surrounding the doors of the




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\* The celebrated Dr. Johnson is described (Faulkner's History of Chelsea), not only as taking great interest in the Chelsea porcelain works, but also as experimenting at them, though apparently with no great success.



works, purchasing the pieces as soon as they were fired. Large prices were given for this porcelain,\* as is indeed the case at the present day, and much skill was exhibited in the enamelling. The claret-colour has been considered as the most remarkable of those employed. Some other enamels are, however, equally good.

As regards marks, the earliest pieces of porcelain do not appear to have had any. The embossed oval with raised anchor upon it , and the anchor with the

cross †, are inferred to be the earliest marks, after which followed the anchor simply painted on the glaze, either in red  or gold  the latter usually affixed to the best porcelain. Two anchors were sometimes employed.

According to Faulkner (*History of Chelsea*), the Chelsea china manufactory was situated at the corner of Justice Walk, and occupied the houses at the upper end of Lawrence Street. Several of the large old houses were used as show rooms. These houses have been long since pulled down and others erected in their place. In July 1843, upon digging the foundation for Cheyne Row West, extensive remains of the Chelsea porcelain works were found, large quantities of broken vases, figures, &c.

According to a memorial† to the government of the time from the proprietor or conductor of the Chelsea works, he was "a silversmith by profession," who, "from a casual acquaintance with a chemist who had some knowledge this way, was tempted to a trial, which, upon the progress he made, he was encouraged to pursue with great labour and expense." Unfortunately the date of the memorial is not given. It may be that supposed to have been sent in not long before the works were closed. Be this as it may, 100 persons

\* Mr. Marryat (*Hist. of Pottery and Porcelain*, 174) quotes part of a letter from Horace Walpole to Sir Horace Mann, of the 4th March, 1763, in which he mentions having seen a set of Chelsea porcelain about to be presented by the King and Queen to the Duke of Mecklenburg, which was to cost 1,200*l*.

† Lansdowne MS. No. 829, fol. 21, printed at length in Marryat's *History of Pottery and Porcelain*, p. 349.



are mentioned as then employed, "of which is a nursery of 30 lads taken from the parishes and charity schools, and bred to designing and painting—arts very much wanted here, and which are of the greatest use in our silk and linen manufactures." The memorialist complains sadly of the smuggling sales of the Dresden porcelain, allowed to be imported for private use, but otherwise prohibited, pointing out "that a certain foreign minister's house has been for a course of years a warehouse for this commerce, and the large parcel advertised for public sale on the seventh of next month is come, or is to come from thence." It appears this Dresden porcelain only paid eighteen pence by the pound when entered for private use, so that the competition established became finally very injurious to the Chelsea porcelain. The memorialist speaks of having sold to the value of more than 3,500*l.* during the previous winter, "which," he adds, "is a great deal, considering the thing is new, and is of so great extent that it has been beyond the reach of his industry to produce such complete assortments as are required in a variety of ways."

The Chelsea porcelain works seem to have been discontinued about 1675. M. Grosley, who visited London in that year, mentions, that being unable to stand their ground, they had just then fallen. The models were then purchased for the porcelain manufactory at Derby, to which, indeed, workmen and artists from the Chelsea works had previously proceeded. Thus the Derby works may be considered as those of Chelsea, carried on in another locality.

- Ce. C. 5.      Plate, painted Chinese design, with red fox.    Mark,  
an anchor in red.
- Ce. C. 6.      Large plate, white ground, painted flowers.    Mark,  
an anchor in red.
- Ce. C. 7.      Plate, painted flowers.    Mark, an anchor in red.
- Ce. C. 8.      Octagonal dish, flowers painted in green.    Mark,  
an anchor in red.
- Ce. C. 9.      Plate, painted fruit.    Mark, an anchor in red.
- Ce. C. 10.     Dish, painted fruit.    Mark, an anchor in red.
- Ce. C. 11.     Small plate, painted flowers.    Mark, an anchor in  
red.
- Ce. C. 12.     Oval shaped dish, flowers painted in green.    Mark,  
an anchor in purple.



Leaf shaped dessert dish, painted flowers and large leaf. Mark, an anchor in gold. Ce. C. 13.

Plate, painted leaves and butterflies. Mark, an anchor in red. Ce. C. 14.

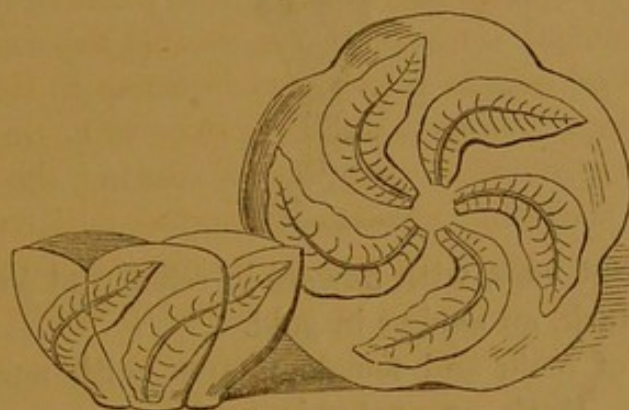
Leafshaped dessert dish with handle, painted flowers and leaf. Mark, an anchor in red. Ce. C. 15.

Two plates, painted roses and leaves. Mark, an anchor in gold. Ce. C. 16. and 17.

Plate, painted peacock. Mark, an anchor in gold. Ce. C. 18.

Cup and saucer (fig. 134). Mark, the embossed oval with anchor. Ce. C. 19.

Fig. 134.



Cup and saucer, painted in pink. Mark, an anchor in red. Ce. C. 20.

Cup, painted in pink. Mark, an anchor in red. Ce. C. 21.

Two-handled cup and saucer, moulded, borders painted green. Mark, red anchor and †. Ce. C. 22.

Two-handled cup and saucer, gilt. Mark, an anchor in gold. Ce. C. 23.

Covered two-handled cup and saucer, moulded, painted fruit. Mark, an anchor in purple. Ce. C. 24.

Cup and saucer, painted birds. Mark, an anchor in gold. Ce. C. 25.

Small vase, blue ground, with peacocks painted in compartments, gilt (fig. 135, on next page). Mark, two anchors in gold. Ce. C. 26.

Cup and saucer of Oriental porcelain, painted at Chelsea. Ce. C. 27.

Saucer of Oriental porcelain, painted at Chelsea. Ce. C. 28.

*Ce. C. 27-28 presented by Mr. A. W. Franks.*

Figure of a peacock, unpainted. This specimen was twisted in the firing, and consequently rejected. It has embossed upon it the raised oval, with an anchor. Ce. C. 29.



Fig. 135.



- Ce. C. 30. Covered vase, with flowers in relief and perforated rim. Mark, an anchor in gold.
- Ce. C. 31, and  
Ce. C. 32. Pair of male and female figures, with nozzles for candles. Mark, an anchor in gold.
- Ce. C. 33. Covered vase, with moulded flowers in relief. No mark.
- Ce. C. 34, and  
Ce. C. 35. A small pair of male and female figures. The latter playing on the *pastorella*, a musical instrument in general use previous to the *spinnet* (fig. 136). Mark, an anchor in gold.

Fig. 136.



Fig. 137.





Small figure (fig. 137). Mark, an anchor in red.

Ce. C. 36.

A covered vessel in the form of a bundle of asparagus.


Ce. C. 37.

Mark, an anchor and 63 in red.

A covered vessel in the form of a melon. Mark, an anchor and 9 in red.

Ce. C. 38.

### DERBY PORCELAIN.


The Derby porcelain works were founded by Mr. William Duesbury in 1751. The articles first manufactured at them appear to have chiefly consisted of small chimney ornaments. Old people at Derby still have a traditional recollection of little figures of lambs in white porcelain, as among the earliest of these productions. Gradually, however, workmen and artists were obtained from the Chelsea works. When the latter were discontinued about 1765, all the moulds and models there used were transferred to Derby, so that Chelsea-Derby became the name for the porcelain there manufactured, a mark  showing this union being employed. When the porcelain manufactory of Bow was discontinued, probably much about the same time, all the moulds and models there also used were purchased for the Derby works, so that the latter may be considered as the Chelsea and Bow porcelain works continued in another locality. Some of the best workmen and artists from both Chelsea and Bow are well known to have settled at Derby.

Upon the decease of Mr. William Duesbury, his son carried on the Derby porcelain works for many years, in concert with Mr. Michael Kean. Both are stated to have been good artists. A third Mr. Duesbury succeeded these partners, and the works were subsequently carried on by Mr. Robert Bloor. They were finally closed in 1848, a minor manufactory, however, still remaining.

There is much uncertainty respecting the materials at first employed at these porcelain works. As for the Chelsea porcelain, there is a tradition that some of the clay was derived directly from China, but of this there seems as yet no very conclusive evidence. It is not improbable that the materials used were much the same as those employed at Chelsea, seeing that the Derby



works became important by the removal of the Chelsea and Bow workmen and artists to them. The Bideford clay could scarcely but have become well known to the Derby porcelain makers, even when the Derby works were first established, as that clay was then much used in the Staffordshire potteries, and the ware made with it was in great demand between 1730 and 1740 (p.111). Among the old receipts for the Derby porcelain bodies there will eventually be found, probably, some definite information on this head. The Cornish kaolins and China stones, which became well known to the potters, especially after their introduction to the Staffordshire potteries, about 1777\*, appear to have been employed in the Derby works towards the end of the last or beginning of the present century, and to have continued in use up to 1848, and the present time.

The mark  is generally known as Crown Derby.

- Ce. D. 1. Plate, white ground, painted border, gilt. Mark, Crown-Derby.
- Ce. D. 2. Plate, painted flowers and green edge, gilt. Mark, Crown-Derby.
- Ce. D. 3. Plate, painted flowers. Mark, Crown-Derby.
- Ce. D. 4. Plate, the centre and rim with painted flowers. Mark, Crown-Derby.
- Ce. D. 5. Plate, a double China Aster painted in the centre. Mark, Crown-Derby.
- Ce. D. 6. Plate, painted fruit. Mark, Crown-Derby.
- Ce. D. 7. Dish, with border of canary colour. Mark, Crown-Derby.
- Ce. D. 8. Oval dish, said to be painted by Billingsley. Mark, a Crown and D.
- Ce. D. 9. Oval dish with blue border, the centre flowers painted by Billingsley. Mark, Crown-Derby.  
*Presented by Mr. T. Haslam.*
- Ce. D. 10. Plate, painted centre and blue border, gilt. Mark, Crown-Derby.
- Ce. D. 11. Small plate, with the yellow American butterwort painted on it. Mark, Crown-Derby.

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\* Derby porcelain seems to have been costly at this time, since Boswell, recording a visit by Dr. Johnson to the Derby works in 1777, mentions that the doctor, though he admired the beauty of the porcelain, objected to the price, observing "that he could have vessels of silver, of the same size, as cheap as what were here made of porcelain."



- Saucer, painted and gilt. Mark, Chelsea-Derby. Ce. D. 12.
- Plate, blue rim, gilt. Mark, Crown-Derby. Ce. D. 13.
- Plate, with flowers painted on the border. Mark, Bloor, Derby. Ce. D. 14.
- Plate, with painted birds, gilt rim. Mark, Bloor, Derby. Ce. D. 15.
- Plate, painted. Mark, a crown and D. Ce. D. 16.
- Plate, with painted green rim and compartments of birds. Mark, a crown and Derby. Ce. D. 17.
- Plate, maroon coloured border, gilt. Mark, a crown and D. Ce. D. 18.
- Plaque, painted in imitation of a cameo, by Haslam. Mark, a crown and D. Ce. D. 19.
- Plate, painted border of light blue, with flowers. Mark, a crown and Derby. Ce. D. 20.
- Pair of oval plaques, dark blue ground, with subjects painted in compartments. Mark, two swords crossed, in imitation of Dresden. Ce. D. 21, and Ce. D. 21a.
- Plate, blue border, gilt, painted fruit in centre. Mark, a crown and D. Ce. D. 22.
- Plate, painted blue border, gilt, with flowers in centre. Mark, a crown and Derby. Ce. D. 23.
- Cup and saucer, pale green border. Mark, Chelsea-Derby. Ce. D. 24.
- Cup and saucer, painted roses. Mark, Chelsea-Derby. Ce. D. 25.
- Cup and saucer, dark blue border (fig. 138). Mark, Chelsea-Derby. Ce. D. 26.

Fig. 138.





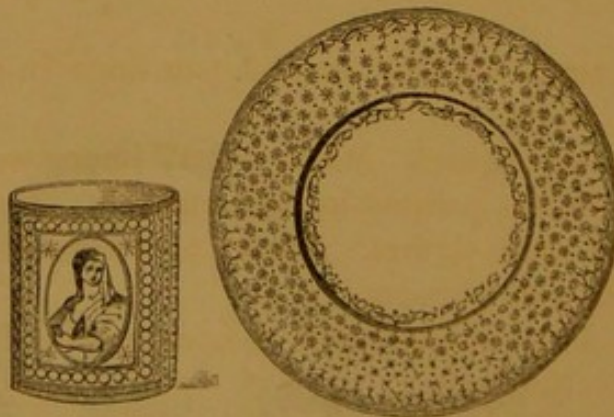
- Ce. D. 27. Double-handled covered cup and saucer (fig. 139).  
Mark, Crown-Derby.

Fig. 139.



- Ce. D. 28. Double-handled cup and saucer, flowers painted in compartments. Mark, Chelsea-Derby.  
Ce. D. 29. Small saucer, painted birds. Mark, Crown-Derby.  
Ce. D. 30. Cup and saucer, scroll of blue flowers and gold. Mark, Crown-Derby.  
Ce. D. 31. Cup and saucer, painted flowers, gilt. Mark, a crown and D.  
Ce. D. 32. Double-handled cup and saucer, painted with canary-coloured bands. Mark, Crown-Derby.  
Ce. D. 33. Cup and saucer, with painted portrait (fig. 140). Mark, Crown-Derby, 239.

Fig. 140.



- Ce. D. 34. Pastile burner, with painted birds. Mark, Bloor, Derby.



- Cup and saucer, with painted flowers. Mark, Crown-Derby. Ce. D. 35.
- Cup and Saucer, painted festoons of flowers. Mark, a crown and D. Ce. D. 36.
- Butter boat, moulded into the form of a duck. Mark, Crown-Derby. Ce. D. 37.
- Figure, with nozzles for two candles. Mark, two swords crossed, in imitation of Dresden. Ce. D. 38.
- Large dish and plate, with perforated borders and painted flowers. Mark, Crown-Derby. Ce. D. 39.
- Figure. Mark, two swords crossed, in imitation of Dresden. Ce. D. 40.
- Large dish with handles, perforated and gilt. Mark, a crown and D. Ce. D. 41.
- A figure of Diana in biscuit. The Crown-Derby mark impressed, and No. 120. Ce. D. 42.
- A figure of Mars, in biscuit. Mark, No. 114 impressed. Ce. D. 43.
- Three figures, marked with two swords crossed, in imitation of Dresden. Ce. D. 44, 45, and 46.
- Double-handled vase, painted birds and water scenery. Mark, Bloor, Derby. Ce. D. 47.
- Vase, with figures of swans in relief, blue ground. No mark. Ce. D. 48.
- Pair of chimney ornaments, flowers in relief, painted. No mark. Ce. D. 49. a, and b.
- Covered perforated vase, with painted flowers in relief. No mark. Ce. D. 50.
- Small figure, a woman feeding a cat. Mark, a crown and D. Ce. D. 51.
- Chimney ornament, raised flowers, painted. No mark. Ce. D. 52.
- Vase, turquoise blue ground, paintings in compartments. No mark. Ce. D. 53.
- Two small figures. Mark, No. 17 impressed. Ce. D. 54.
- Large bottle, painted in Eastern style. No mark. Ce. D. 55.
- Pair of small figures. Mark, two crossed swords, in imitation of Dresden. Ce. D. 56.
- Vase, blue ground, with compartments of painted flowers. No mark. Ce. D. 57.
- Figure playing the triangle. Mark, two swords crossed, in imitation of Dresden. Ce. D. 58.
- Figure of Falstaff. No mark. Ce. D. 59.



- Ce. D. 60. A peacock, with flowers in relief. Mark, a crown and D.
- Ce. D. 61. Vase, light blue ground and painted flowers in compartments. No mark.
- Ce. D. 62. Bottle, dark pink ground with flowers painted in compartments. Mark, Bloor, Derby.
- Ce. D. 63. Bottle, dark blue ground with flowers in relief. Mark, a crown and Derby.
- Ce. D. 64. Bottle, dark blue ground gilt, with flowers painted in compartments. Mark, a Crown and two L's crossed, in imitation of Sèvres.
- Ce. D. 65. Large two-handled vase, blue ground with birds painted in a compartment on one side and flowers on the other, gilt (fig. 141). No mark.

Fig. 141.



## PLYMOUTH PORCELAIN.

As has been seen (p. 16), William Cookworthy, of Plymouth, had been engaged in experimenting on Cornish kaolin and porcelain granite prior to 1758, when Borlase published his *Natural History of Corn-*



wall. Cookworthy, who was a member of the Society of Friends, and in the latter part of his life an eminent minister of that society, was born at Kingsbridge, South Devon, in 1704. In early life, he with his brother Jacob became chemists and druggists in Nut Street, Plymouth, and William seems to have acquired considerable reputation for his chemical knowledge. It was this knowledge which seems to have induced him to direct his attention to the manufacture of porcelain, especially after the Père d'Entrecolles, who, in 1712, resided at King-te-chin, a famous locality for porcelain works in China, had made known the materials employed, and these had been sent to Paris in 1727-1729.

In a letter to Mr. Hingston, of Penryn, Cornwall, dated 30th May, 1745, Cookworthy mentions a person from Virginia, as having informed him that he had discovered both kaolin and petunze there, and had made certain pieces of porcelain with them, which he showed Cookworthy. Whatever the value of the information may have been, the letter shows that Cookworthy had his attention directed to the materials for the manufacture of porcelain at that time.\*

Mr. Prideaux infers that his discovery of the kaolin and porcelain granite of Cornwall may have taken place about 1755.† Whatever may have been the precise progress in obtaining both the kaolin and porcelain granite of Cornwall, afterwards systematically employed,—and Cookworthy evidently searched the country in different directions,‡—we find him and Lord

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\* The following is an extract from this letter : " I had lately with me the person who has discovered the China earth. He had with him several samples of the China ware, which I think were equal to the Asiatic. It was found on the back of Virginia, where he was in the quest of mines ; and having read Du Halde, he discovered both the petunze and the kaolin. It is this latter earth which he says is essential to the success of the manufacture. He is gone for a cargo of it, having bought from the Indians the whole country where it rises. They can import it for 13*l.* per ton : and by that means afford their china as cheap as common stone ; but they intend only to go about 30 per cent. under the company." He then proceeds to express no very high opinion of this person, and it will be observed that " samples of the ware " were shown, while no mention is made of actual specimens of kaolin and petunze.

† Relics of William Cookworthy, 1853, p. 4.

‡ Borlase (Nat. Hist. of Cornwall) mentions his researches in the parish of Breague, and Mr. Prideaux quotes information received from Mr. Martin (of St. Austel Blowing House), to the effect that Cookworthy first discovered porcelain granite in the tower of St. Columb church, which was built of that granite from St. Stephens'.



Camelford carrying on porcelain works at Plymouth in 1768, at which time they had taken out a patent for the use of the Cornish kaolin and porcelain granite.\* Cookworthy, who is described as a man of considerable energy, possessing an ardent desire for the advancement of knowledge, was then in his 65th year. The patent was apparently purchased by Mr. Richard Champion, a merchant of Bristol, within three or four years after it was obtained, the works not having answered to Lord Camelford and Mr. Cookworthy. In 1772 they were removed to Bristol.

The porcelain works were carried on at Coxside, Plymouth, where, Mr. Prideaux informs us, the buildings, &c. thus used are now occupied as a shipwright's offices and yard. An excellent painter and enameller is represented as having been procured from France, and the celebrated enameller, Bone, is stated to have served his apprenticeship at these works. From fifty to sixty persons were engaged at them; the demand for the blue and white porcelain is mentioned as having been considerable, and the fuel employed to have been chiefly wood.†

The Plymouth porcelain, undoubted specimens of which have become exceedingly scarce, comes under the head of that usually termed "hard." The materials employed seem to have been little else than Cornish kaolin and porcelain-granite. The mark, when one has been used, is 24, that for tin, a mark probably adopted from the stanniferous character of

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\* The following letter from Lord Camelford to Mr. Polwhele (*Hist. of Cornwall*), dated Boconnoc, November 30, 1790, is important on this subject: "With regard to the porcelain manufactory that was attempted to be established some years ago, and which was afterwards transferred to Bristol, it was undertaken by Mr. Cookworthy, upon a friend of his having discovered on an estate of mine in the parish of St. Stephen's, a certain white saponaceous clay; and close by it, a species of granite or moorstone, white with greenish spots, which he immediately perceived to be the two materials described by the missionary Père d'Entrecolles, as the constituent parts of the Chinese porcelain; the one giving whiteness and body to the paste, the other vitrification and transparency. The difficulties found in proportioning properly these materials, so as to give exactly the necessary degree of vitrification, and no more, and other niceties with regard to the manipulation, discouraged us from proceeding in this concern, after we had procured a patent for the use of our materials, and expended on it between two and three thousand pounds. We then sold our interest to Mr. Champion of Bristol."

† Burt's *Review of Plymouth* (1816), as quoted by Prideaux, *Relics of Cookworthy*, p. 5.



the portion of country where the materials were obtained.

Small figure, not painted.

Ce. E. 1.

*Presented by Mr. Montagu E. Parker.*

Small figure, painted.

Ce. E. 2.

*Presented by Earl Morley.*

Coffee cup, with painted flowers. (Fig. 142.)  
Marked in red.

Ce. E. 3.

*Presented by Mr. Montagu E. Parker.*

Fig. 142.



Milk jug, with painted flowers.

Ce. E. 4.

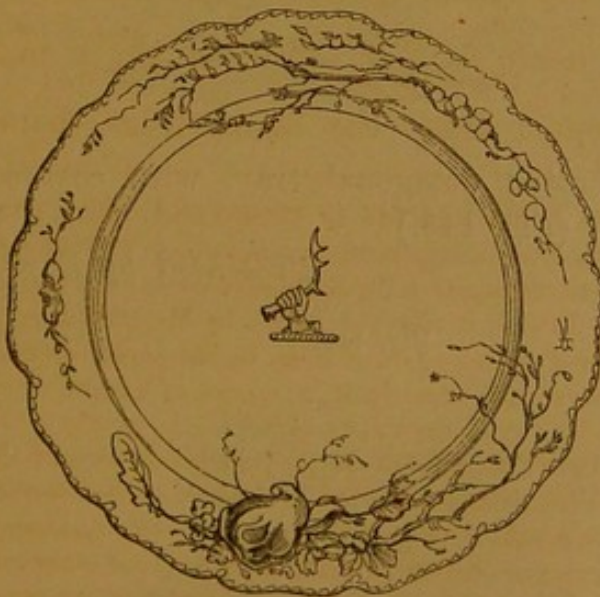
*Presented by Mr. Montagu E. Parker.*

Earthenware plate, with thick white enamel, on which is painted, in green, the crest of the Parker family. (Fig. 143.)

Ce. E. 5.

*Presented by Mr. Montagu E. Parker.*

Fig. 143.



Sugar basin of earthenware, with thick white enamel, painted.

Ce. E. 6.

*Presented by Mr. Montagu E. Parker.*



- Ce. E. 7. Mug, with the Plymouth mark in gold.  
*Presented by Earl Morley.*
- Ce. E. 8. Coffee cup, not marked.  
*Presented by Earl Morley.*
- Ce. E. 9. Saucer, with Chinese pattern and Plymouth mark in blue.  
*Presented by Mr. Montagu E. Parker.*
- Ce. E. 10. Butter boat, pattern impressed, and painted blue.  
No mark. (?)  
*Presented by Sir William Snow Harris.*
- Ce. E. 11, and 12. Large pair of figures, on which the peculiar glaze of some of the Plymouth porcelain is well seen.  
*Presented by Mrs. General Nelson, of Plymouth.*
- Ce. E. 13. Bust of the Duke of Cumberland.  
*Presented by Mr. Carruthers.*
- Ce. E. 14. Small cup, with impressed pattern. (?)  
*Presented by Earl Morley.*
- Ce. E. 15. Figure of a dog, imitation of Dresden. (?)  
*Presented by Mr. Montagu E. Parker.*
- Ce. E. 16 and 17. Pair of salt cellars, form shown in (fig. 144.)  
*Presented by Mr. Williams, of Plymouth.*

Fig. 144.



- Ce. E. 18. A perforated octagonal tray, with covered ornament. (?) (Fig. 145.)

*Presented by Earl Morley.*

Fig. 145.

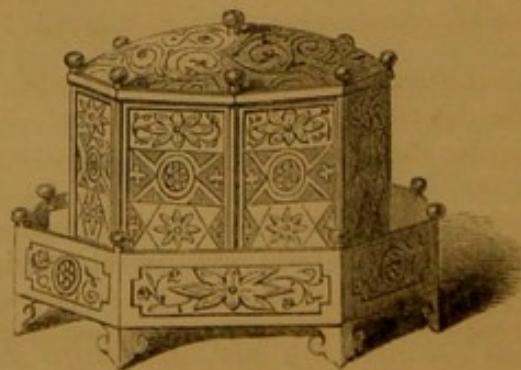


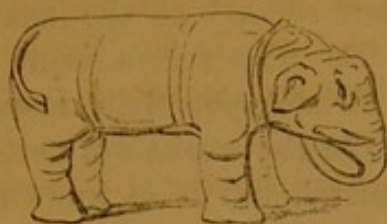


Figure of an elephant. (?) (Fig. 146).

Ce. E. 19.

*Presented by Earl Morley.*

Fig. 146.



Small coffee cup, with pattern of raised flowers.

Ce. E. 20.

*Presented by Mr. Montagu E. Parker.*

#### BRISTOL PORCELAIN AND EARTHENWARE.

As previously mentioned (p. 160), the Plymouth porcelain works, after their purchase by Mr. R. Champion, were transferred to Bristol in 1772. Cookworthy certainly retained some interest in the Bristol works, since we find, in a letter from him to Ann Cookworthy, (apparently a niece at Plymouth),—the letter unfortunately with no other date than, “Bristol, 4th day, 10 o’clock,”—that he mentions being detained there closing his business with Richard Champion, whose behaviour he praises.\* As Pryce in his *Mineralogia Cornubiensis*, published in 1778, when noticing Cornish kaolins, adverts to the fine porcelain then made by Cookworthy at Bristol, as likely to rival the best Asiatic, Cookworthy must have then been well known as connected with the Bristol works; or, at least, nearly up to that date. After closing his connexion with the works, he appears to have devoted his remaining years, until his death, aged 76, at Plymouth, in 1780, to his duties as a minister in the Society of Friends.†

\* Prideaux’s *Relics of Cookworthy*, p. 22. This letter incidentally shows the rate of travelling in those days between Bristol and Plymouth. Speaking of when the business would be settled, Cookworthy says, “and then, if health permits, I shall set out in the machine, second day (Monday) morning, and reach Plymouth on fourth day (Wednesday). The express train now travels over the same distance in four hours and a quarter.

† In a letter to his daughter Lydia (*Prideaux’s Relics of Cookworthy*, p. 18), dated Wadebridge (Cornwall), and referred to 1777, he gives an account of one of his progresses on his duties at St. German’s, Camelford, and Port Isaac.



It has been shewn (p. 113), that a Staffordshire company bought the patent which had been sold by Cookworthy and Lord Camelford to Champion, or at least the use of it, from the latter in 1777, and that Champion himself resided at the Staffordshire potteries before 1782. There is a want of information respecting the Bristol porcelain manufactory about this time. In 1772 the works were established in the Castle Green, Bristol, and it is known that porcelain was made there in 1775.\*

In 1787, the present earthenware pottery was established at the Temple Backs, and some kind of transfer is supposed to have been effected from the old works in the Castle Green. The object of this pottery was to produce Queen's and other earthenware as cheap as could be sent from Staffordshire to Bristol.†

There had been previously a pottery for coarse ware made from clays of the neighbourhood, on the site where this pottery was established. The use of the kaolin and porcelain granite was then discontinued, and the earthenware made, as now, with Poole (Dorset) clay, and flints from Wiltshire.‡

Specimens of Bristol pottery have now become very scarce. The mark for it, when the pieces were marked, seems to have been a cross in blue.

- |           |  |
|-----------|--|
| Ce. F. 1. | An earthenware jug, painted.                     |
| Ce. F. 2. | Small cup with a rim of a pink colour. No mark.  |
| Ce. F. 3. | Porcelain cup and saucer, with the mark in blue. |
- Presented by the Duchess of Northumberland.*

\* Mr. Etheridge, of the Institution, Bristol, ascertained, in 1853, that an old man, who died in 1852, had worked at that time in the Castle Green works. This man subsequently lived with Mr. Powell, at the earthenware establishment in Temple-street, Bristol, and Mr. Powell possesses a note-book containing receipts employed in the time of Cookworthy.

† The following advertisement has been preserved, inserted in the Bristol Gazette and Public Advertiser, for Thursday, January 18, 1787, No. 1,010 :—"Bristol Pottery, Temple Backs. Joseph Ring takes this opportunity to inform merchants and others that he has established a manufactory of the Queen's and other earthenware, which he will sell on as low terms, wholesale and retail, as any of the best manufacturers in Staffordshire can render the same to Bristol."

‡ From information obtained by Mr. Robert Etheridge, to whom we are much indebted for inquiries respecting the Bristol porcelain and earthenware works.



## LEEDS WARE, 1760.

The ware manufactured at Leeds was of a cream colour, like some Staffordshire, with much perforated work. Mark said to be C.G. or an arrow-head. Mr. Green, the proprietor of the pottery, published a book of patterns in 1770, a copy of which Mr. Marryat states is in the British Museum. The library of the Museum of Practical Geology also contains a copy of one of these pattern books, printed in English, French, and German, of which the title is as follows: "Designs of sundry articles of Queen's or cream colour'd earthenware, manufactured by Hartley, Greens & Co. at Leeds Pottery; with a great variety of other articles. The same enamel'd, printed or ornamented with gold to any pattern; also with coats of arms, cyphers, landscapes, &c. &c. Leeds, 1786." This book, from which three plates are missing, was presented to the library by Mr. W. Sykes Ward, of Clay Pits House, Leeds. In 1796, Hutchings, in his History of Dorset, mentions, that of the 10,000 tons per annum of Poole clay then exported, a portion was to Selby, for the Leeds Pottery (*ante note*, p. 5).

The perforated work of this earthenware appears, from the book before mentioned, to have been chiefly confined to one pattern; and although the following specimens are not to be found in any of the plates, still the style of ornament is so constant that there can be little difficulty in attributing them to this manufactory.

A cream coloured dish with perforated work.

Ce. F. 4.

A cream coloured night lamp with perforated work.

Ce. F. 5.

## PLACE'S WARE.

Made at the Manor House, York. Only two specimens of this manufacture have been identified; one in the possession of Mr. A. W. Franks, formerly in the Strawberry Hill collection; the other in the cabinet of a lady.

## ROCKINGHAM PORCELAIN AND EARTHENWARE.

The pottery so called was manufactured at Swinton, near Rotherham, Yorkshire.



As early as the year 1757, a tile yard and a manufactory of earthenware was established on the estate of Charles, Marquis of Rockingham, in Swinton, Wath-upon-Dearne. The then tenant and occupier, Mr. Edward Butler, was induced to establish the manufactory there, from the circumstance of various beds of clay having been found in an adjacent parcel of ground called Swinton Common, consisting of the common yellow clay used for the purposes of making bricks, tiles, and coarse earthenware; a finer white clay for making pottery of a better quality; an excellent clay for making fire bricks; and also a white clay usually called pipe clay.

In 1765, the works became tenanted by Mr. William Malpass, who carried on the same kind of manufactory.

In 1778, the works were taken by Messrs. Thomas Bingley and Co., a more opulent company, who considerably enlarged them, and carried on an extensive trade not only in the commoner descriptions of earthenware, but also in white, and blue and white dinner and tea services, and other wares of a superior quality. They also manufactured the brown or chocolate-coloured tea and coffee services, pitchers, &c., which obtained the name of "The Rockingham Ware," for which the demand was then considerable, and continues to be so to the present time.

In 1807, the works passed into the hands of Messrs. John and William Brameld; and, upon their deaths, Messrs. Thomas, George Frederick, and John Wager Brameld became the tenants. During their tenancy the works were much enlarged, and a mill for grinding flints was erected. Many improvements were introduced in the manufactory of dinner-services, &c., and of useful and ornamental earthenware of every description. About the year 1820, Mr. Thomas Brameld (in addition to the ordinary works) directed his attention to the manufactory of porcelain of the finest description, sparing no labour or cost in bringing it to perfection; and in the painting and gilding, he employed the best artists.

At these works were produced in glazed porcelain, dinner, dessert, breakfast and tea services, vases,



groups of flowers, chimney and drawing-room ornaments, cornices, &c., all richly painted and gilded; and in plain white biscuit china, vases, flower baskets, flowers, statuettes, busts, &c. Amongst their various productions were a dinner and dessert service, on an extensive scale, richly painted and ornamented, for His late Majesty King William IV.; and also a vase of a very large size, which is now at Wentworth Woodhouse, and is the property of Earl Fitzwilliam, the owner of the works.

In the years 1826 and 1827 (years of great commercial difficulties) Messrs. Brameld became embarrassed, but the works were continued by them, with the assistance of Earl Fitzwilliam their landlord, till the year 1842, when they were discontinued as a manufactory either of earthenware or porcelain.

A portion of the works is still occupied by Mr. Isaac Baguley (formerly in the employ of Messrs. Brameld in the painting and gilding department), who purchases earthenware and china in the biscuit state, and completes the painting, gilding, and ornamental work for sale. The flint mill is still occupied and worked by Mrs. Brameld, the widow of the late Mr. Thomas Brameld. The materials used by Messrs. Brameld in their china and porcelain works, were Cornwall stone and china clay, from St. Austell, in Cornwall,—calcined bones,—and flints, from Ramsgate, Sandwich, Shoreham, and other parts of the coasts of Kent and Sussex, which were ground at the works. Clay was also obtained from Wareham and other parts of the coast of Dorset.

For the above information we are indebted to the kindness of the Earl Fitzwilliam, K.G.

Plate, the royal arms painted in centre, turquoise blue border, with gilt oak leaves. Mark, a griffin (the Rockingham crest), with Royal Rockingham Works. Brameld.

Ce. G. 1.

Plate, the royal arms painted in centre, green border, with gilt oak leaves. Mark, similar to Ce. G. 1.

Ce. G. 2.

*Ce. G. 1. and Ce. G. 2 were the pattern plates for the dessert service for William IV., mentioned above. They were presented to the Museum by Earl Fitzwilliam, K.G.*



- Ce. G. 3. Cup and saucer, compartments painted green, gilt. Mark, the crest, with Rockingham works. Brameld, manufacturer to the King.
- Ce. G. 4. Cup and saucer, green ground, painted with roses and gilt leaves. Mark, similar to Ce. G. 3.
- Ce. G. 5. Cup and saucer, white ground, and compartments painted green, with small festoons of flowers. Mark, similar to Ce. G. 3 and 4.
- Ce. G. 6. Cup and saucer, with twisted handle; exterior of a chocolate colour, upon which flowers are painted in gold; on the interior of both the cup and saucer are painted wreaths of flowers. No mark, but purchased from the manufactures.
- Ce. G. 7. Egg cup and saucer, white ground, with painted butterflies and flowers (fractured). Mark, the Rockingham crest and Rockingham works, Brameld.

*Presented by Mr. Ben. Biram.*

#### WORCESTER PORCELAIN.


According to the historians of Worcester,\* the porcelain manufactory was established there in 1751,† chiefly through the exertions of Dr. Wall, a physician of that city. It is difficult to ascertain the materials used for the porcelain first manufactured. As clays of importance, and of sufficient quality for such purposes, those of Dorset (Poole) and the Devon (Bideford) were then only known, except where any local white, or pipe clays, as they were termed, might be obtained. The latter clay was well known to the Staffordshire potters between 1730 and 1740, and the use of calcined flint was at that time also well understood; so that, as regards these substances, they had the same means of procuring them as those potters. Indeed, for the importation of the Bideford and (supposing it also used) the Poole clays, the Worcester manufacturers were somewhat better situated than those of Staffordshire, while with regard to fuel they were not so well placed.


\* Nash's History of Worcestershire, vol. ii. p. 124; and Green's History and Antiquities of Worcester.

† The same date as that of the establishment of the Derby works. Probably the great success of the Chelsea and Bow porcelain about this time, directed much attention to this manufacture. This success may have had some influence on the spread of earthenware, as manufactured in Staffordshire. The Swansea pottery was established in 1750.



The printing on biscuit ware, such an important method of multiplying designs, and which has had so much influence on the cheapening of ornamented earthenware, is attributed to Dr. Wall, not long after the establishment of the Worcester works. A valuable example, mentioned among the following specimens, is dated 1757, and there is no reason to suppose that this date is that of the first successful trials.

The early productions of Worcester seem chiefly to have been imitations of China and Japan wares, imitations much encouraged by the high repute in which that kind of porcelain was then held. The blue and white Nankin porcelain seems to have been much followed. False marks were affixed, especially to the early imitations of the Japan wares. The earliest ordinary mark, a crescent , can scarcely be referred

to such imitated marks. That of , subsequently employed, bears a somewhat more general resemblance to a Chinese mark.

In 1763 the Worcester porcelain seems to have been much esteemed for its qualities. Thus, a person writing in the "Annual Register" for that year, after noticing the porcelain of Dresden and Chantillon, and classing that of Chelsea with them, considering all as more ornamental than useful, and as costly as Oriental porcelain; adds, "We have indeed many other manufactures of porcelain, which are sold at a cheaper rate than any that is imported, but except the Worcester, they all wear brown, and are subject to crack, especially the glazing, by boiling water."

The exact time at which Cornish kaolin and China stone were first employed at the Worcester works is somewhat uncertain. The purchase of Champion's (Cookworthy's) patent was, we have seen, effected by a Staffordshire company in 1777. If, as has been supposed, Cookworthy was engaged in the Worcester works after he left Bristol,\* it may have been by

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\* Mr. Marryat supposes (Hist. of Pottery and Porcelain, p. 185) that Cookworthy was engaged in the Worcester works. If so, this might have happened before 1787, when his son-in-law, Mr. Ring, established the Bristol earthenware pottery, after the Bristol porcelain works, founded by Cookworthy in 1772, had been abandoned.



arrangement with Champion, somewhat about that time.

In 1783, the Worcester porcelain works were purchased by Mr. Thomas Flight, from whom they afterwards passed to Messrs. Flight and Barr. Some experiments on a new combination for a porcelain body or paste under the latter, in 1813, led to the works carried on for a short time at Nantgarw (Glamorganshire), two parties employed in the mixing room having absconded to that locality with what they considered an important secret.

- Ce. H. 1. Small plate, with Chinese pattern, painted in blue.
- Ce. H. 2. Small cup, white ground with painted blue flowers. Mark, an arrow head.
- Ce. H. 3. Small pickle dish of a leaf shape. Mark, the crescent.
- Ce. H. 4. Perforated two-handled dish, with flowers in blue. Mark, the crescent.
- Ce. H. 5. Mug, with blue flowers. Mark, W.
- Ce. H. 6. Large plate, with impressed flower pattern and flower in blue. Mark, the crescent.
- Ce. H. 7. Small octagonal shaped saucer, with flowers in blue. Mark, T.
- Ce. H. 8. Small mug, flowers in blue. Mark, the crescent near the spout.
- Ce. H. 9. Saucer, with an impressed pattern, and centre and border in light blue. Mark, the crescent.
- Ce. H. 10. Cup and saucer, blue pattern. Mark, the crescent.
- Ce. H. 11. Small covered vase, flowers painted in pink. Mark, the square.
- Ce. H. 12. Jug, with a portrait of the King of Prussia and 1757 printed on it; also RH, Worcester (fig. 147). (*See next page.*)
- Ce. H. 13. Large mug, with portraits and figures printed on it.
- Ce. H. 14. Large mug, similar to Ce. H. 13.
- Ce. H. 15. Covered perforated tureen and dish, with flowers in relief painted blue. Mark, the crescent.
- Ce. H. 16. Jug, with twisted handle, printed. Mark, cross swords and 9.
- Ce. H. 17. Covered jug of similar form, cream coloured body, with flowers, richly gilt. Mark, cross swords and 9, similar to Ce. H. 16.
- Ce. H. 18. Small moulded cup, cream coloured body, gilt border. No mark.



Fig. 147.

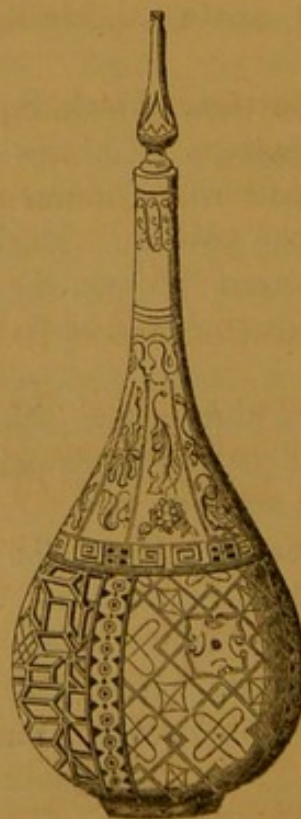


- Basin, with painted Oriental design. Mark, the square. Ce. H. 19.
- Small cup and saucer, Oriental pattern. Mark, the square. Ce. H. 20.
- Covered two-handled cup and saucer, Oriental pattern. Mark, the square. Ce. H. 21.
- Two-handled cup and saucer, Oriental pattern. Chinese mark. Ce. H. 22.
- Small cup, Oriental pattern. Chinese mark. Ce. H. 23.
- Plate, Oriental pattern. Mark, Chamberlain—Worcester. Ce. H. 24.
- Plate, Oriental pattern. Mark, Square—Worcester. Ce. H. 25.
- Plate, Oriental pattern. Chinese mark. Ce. H. 26.
- Plate, Oriental pattern. Chinese mark. Ce. H. 27.
- Covered jar, Japan pattern. Mark, the square. Ce. H. 28.
- Basin, Japan pattern. Mark, the crescent. Ce. H. 29.
- Large jug, blue ground, and birds in compartments. Mark, the square. Ce. H. 30.
- Two-handled cup and saucer. Mark, the crescent. Ce. H. 31.
- Basin, dark blue ground, birds painted in compartments. Mark, the square. Ce. H. 32.
- Small cup and saucer. Mark, the crescent. Ce. H. 33.
- Flower-holder, dark blue ground, birds painted in compartments. Mark, the square. Ce. H. 34.
- Small cup and saucer. Mark, the crescent. Ce. H. 35.
- Dish, with perforated border. Mark, the square. Ce. H. 36.
- Cup and saucer. Mark, two swords crossed and 9, similar to Ce. H. 16, and 17. Ce. H. 37.



- Ce. H. 38. Small two-handled covered vase, blue ground, birds painted in compartments. Mark, the square.
- Ce. H. 39. Two-handled covered cup and saucer, painted. Mark, the crescent.
- Ce. H. 40. Large jug, festoons of flowers painted and gilt. No mark.
- Ce. H. 41. Cup and saucer, painted flowers and blue border. Mark, the crescent.
- Ce. H. 42. Two-handled vase, wanting cover. Mark, the crescent and Flight.
- Ce. H. 43. Small chimney ornament, plain white. Mark, a crown and B.F.B. impressed.
- Ce. H. 44. Small covered vases, plain white. No mark.
- Ce. H. 45. Small chimney ornament. No mark.
- Ce. H. 46. Covered cup and saucer, painted and gilt. Mark, a crown and B.F.B., and Barr, Flight, and Barr, Royal Porcelain Works, Worcester, in pink.
- Ce. H. 47. Covered perforated vase, with honey-comb work, painted and gilt. Marked in the cover, Chamberlain, Worcester.
- Ce. H. 48. Scent bottle in same style as Ce. H. 47. (Fig. 148.)

Fig. 148.





- Two-handled vase, green ground, with painted flower. Mark, a crown and F.B.B. Ce. H. 49.
- Large two-handled vase, blue ground, painted compartments. Marked in pink, "Marguerite, the Rose Queen of Salency, Mrs. S. C. Hall," and Chamberlain and Co., Worcester. Ce. H. 50.
- Pair of large two-handled vases, green ground. On one is painted a view of Malvern, and on the other a view of Worcester. Mark, Grainger, Lee, and Co., Worcester. Ce. H. 51 and 52.
- Plate, flowers painted in centre, dark blue border. Mark, Chamberlain's Royal China, Worcester. Ce. H. 53.
- Plate, vase of flowers painted in centre, dark blue border, gilt. Mark, a crown and F.B.B. impressed; also Flight, Barr, and Barr, proprietors of the Royal Porcelain Works, Worcester, established 1751. Ce. H. 54.
- Plate, birds painted in centre and flowers in compartments on border of dark blue. Mark impressed, Chamberlain's, Worcester. Ce. H. 55.
- Plate, flowers painted in compartments on border of dark blue, richly gilt. Mark impressed, Chamberlain, Worcester. Ce. H. 56.
- Plate, green ground, birds painted in compartments. Mark, Chamberlain's, Worcester, in red. Ce. H. 57.
- Plate, maroon ground, flowers painted in centre. Mark, royal arms, and Chamberlain's, Worcester, in pink. Ce. H. 58.
- Plate, blue border, flowers painted in compartments and centre. No mark. Ce. H. 59.
- Plate, birds painted in compartments on pink border. No mark. Ce. H. 60.

## SHROPSHIRE AND COLEBROOK DALE PORCELAIN.

The original works, at which the early Shropshire porcelain was manufactured, were small, and situated at Caughley, near Broseley. They were established about 1772, under Mr. John Turner, who is represented as having come from the Worcester works. The mark upon the wares produced was the letter S.

The present Coalport or Colebrook Dale works were established in 1780, by Mr. Rose, the uncle of the present proprietor of the same name.

Porcelain mug, painted blue. Mark, S.

Ce. I. 1.



- Ce. I. 2. Cup and saucer, blue flowers, gilt. Mark, S.  
 Ce. I. 3. Two-handled covered cup and saucer, painted blue flowers, gilt. (Fig. 149.) Mark, S.

Fig. 149.



- Ce. I. 4. Plate, fruit and flowers painted in centre, and musical instruments in compartments on green border, gilt. Mark, John Rose and Co., Colebrook Dale. 1850.  
 Ce. I. 5. Plate, pink ground with painted flowers. Mark, similar to Ce. I. 4.  
 Ce. I. 6. Plate, with the order of Saint Andrew painted in the centre, and various orders on the border of dark blue ground ; part of a service manufactured by command of the Queen for the Emperor of Russia. From the Great Exhibition of 1851.  
*Presented by Messrs. Daniells, New Bond Street.*  
 Ce. I. 7. Plate, flowers painted in the centre and in compartments on border, gilt. Mark, John Rose and Co., Colebrook Dale, 1850, similar to Ce. I. 4 and Ce. I. 5.  
 Ce. I. 8. Plate, birds painted in centre, blue rim, gilt. Mark, same as Ce. I. 7.  
 Ce. I. 9. Plate, flowers painted in centre and birds in compartments on blue border. Mark, same as Ce. I. 7.  
 Ce. I. 10. Plate, fruit painted in centre, light blue border, gilt. Mark, same as Ce. I. 7.  
 Ce. I. 11. Two-handled vase, with painted peacock. Mark, an anchor, in imitation of Chelsea.  
 Ce. I. 12. Covered cup and saucer, turquoise blue ground and flowers painted in compartments. Mark, two L's crossed, in imitation of Sèvres.



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|---|------------|
| Covered cup and saucer, bleu de roi ground and cupids painted in compartments. Mark, two L's crossed, in imitation of Sèvres. | Ce. I. 13. |
| Large two-handled vase, with perforated cover and flowers painted in compartments. No mark.                                   | Ce. I. 14. |
| Cup and saucer, painted birds and blue border. No mark.   | Ce. I. 15. |
| Coffee cup and saucer, white ground and painted flowers. Mark, two L's crossed, in imitation of Sèvres.                       | Ce. I. 16. |
| Covered cup and saucer of egg-shell porcelain, in imitation of the oriental, vermicelli pattern in gold.                      | Ce. I. 17. |
| Vase, with painted peacock. Mark, an anchor, in imitation of Chelsea.   | Ce. I. 18. |

#### SWANSEA EARTHENWARE AND PORCELAIN, INCLUDING NANTGARW PORCELAIN.

Earthenware works were established at Swansea about the year 1750, and the ware there manufactured was of much the same kind as that then produced at the Staffordshire potteries. The works, with the name of "Cambrian Pottery," became much extended in 1790, under the management of Mr. George Haynes. About the close of the century he introduced a superior kind of ware, giving it the name of "Opaque China." In 1802, Mr. Lewis Weston Dillwyn purchased the Swansea works, and soon after, by the aid of Mr. W. W. Young, the draftsman employed by him in his works on natural history, whom he had had instructed in enamel painting, the opaque china became remarkable for beautiful and truthful paintings of birds, butterflies, and shells, drawn from nature. It was not until 1814 that any translucent body, or approach to porcelain, was made at Swansea.

Respecting the origin of the Swansea porcelain, Mr. Dillwyn has afforded us the following information:—

"My friend Sir Joseph Banks informed me that two persons, named Walker and Beely, had sent to Government, from a small manufactory at Nantgarw (ten or twelve miles north of Cardiff), a specimen of beautiful china, with a petition for their patronage, and that, as one of the Board of Trade, he requested me to examine



and report upon that manufactory. Upon witnessing the firing of a kiln at Nantgarw, I found much reason for considering that the body used was too nearly allied to glass to bear the necessary heat, and observed that nine-tenths of the articles were either shivered, or more or less injured in shape by the firing. The parties, however, succeeded in making me believe that the defects in their porcelain arose entirely from imperfections in their small trial kiln, and I agreed with them for a removal to the Cambrian pottery, at which two new kilns, under their direction, were prepared. While endeavouring to strengthen and improve this beautiful body, I was surprised at receiving a notice from Messrs. Flight and Barr, of Worcester, charging the parties calling themselves Walker and Beely with having clandestinely left an engagement at their works, and forbidding me to employ them."

Such was the origin of the Swansea porcelain, which was afterwards manufactured, an excellent body having finally been obtained. As might be expected, the natural history objects painted upon it were most carefully executed. The manufacture was not long continued, other occupations engaging the attention of Mr. Dillwyn, and in 1817 the porcelain was laid aside, and earthenware again became the sole product of the Swansea pottery.

The North Devon or Bideford clays seem to have been early employed at the Swansea works, as also the Dorset or Poole clays, the last still continuing to be extensively used. Cornish kaolin and China stone likewise formed a portion of the porcelain body. Steatite, from veins in the serpentine of the Lizard, Cornwall, was also employed during the manufacture of the porcelain. Flints were obtained, as at present, chiefly as ballast in trading vessels and colliers, from the chalk districts of the south and south-east of England.

As regards marks, a few early trial pieces were alone marked "Nantgarw." Mr. Dillwyn says that "the articles made at, and marked 'Swansea,' include all, I believe, which have a more compact fracture, and the addition of a trident denotes a supposed improvement, which was not ultimately found to answer."



Plate, flowers painted in centre, gilt rim. Mark, Swansea, in red. Ce. K. 2.

Plate, a bird (Hoopoe) painted in centre. Mark, Swansea, in red. Ce. K. 3.

Plate, white porcelain. Mark, Swansea, and a trident impressed. Ce. K. 4.

Plate, plain, with gilt rim. Mark, Swansea, in red. Ce. K. 5.

Small vase of white porcelain. Mark, Swansea, impressed. This specimen is of the same body or paste as the Nantgarw specimens, and was an experimental trial made in 1814-15 to render the body more durable. Ce. K. 6.

Cup and saucer, white, with gilt edges. Mark, Swansea, in red. Ce. K. 7.

Basin, white ground, with gilt pattern. Mark, Swansea, in red. Ce. K. 8.

Earthenware plate, with three butterflies (P. Cardui, P. Turlinei, and P. Egeria ) painted on it. No mark. Ce. K. 9.

*Ce. K. 1 to 9, presented by Mrs. Dillwyn.*

Earthenware dish, with bird (Motacilla boarula, grey wagtail) painted on it. Mark, Swansea, G. impressed. Ce. K. 10.

Earthenware dish, with bird (Falco Æsalou, merlin) painted on it. Mark, Swansea, G., impressed. Ce. K. 11.

Earthenware dessert dish, with bird (Falco cyaneus, hen harrier) painted on it. Mark, Swansea, G., impressed. Ce. K. 12.

Covered earthenware sugar-basin, with butterflies painted on it. Ce. K. 13.

Fig. 150.



Earthenware centre piece for dessert service, with a bird (Falco chrysalus, golden eagle) painted in centre. Mark, Swansea, G., impressed. Ce. K. 14.



- Ce. K. 15. Dessert dish, with bird (*Falco tinunculus*, Kestrel) painted on it. Mark, Swansea, G., impressed.  
*Ce. K. 9-15, inclusive, "Opaque-China."*
- Ce. K. 16. Covered earthenware sugar-basin, with gilt fret pattern. No mark.
- Ce. K. 17. Small covered earthenware cup. No mark.
- Ce. K. 18 and 19. Pair of red terra-cotta brackets.
- Ce. K. 20. Earthenware vase, painted in the style of the Greek vases.
- Ce. K. 21. Earthenware tazza, painted in same style as the preceding.  
*Ce. K. 18-21 were presented by Mr. Lewis Dillwyn.*

## NANTGARW PORCELAIN.

- Ce. L. 1. Plate, with birds, butterflies, and festoons of flowers painted on it. Mark, Nant-garw and C. W., impressed.  
*Presented by Mrs. Smyth.*
- Ce. L. 2. Plate, with flowers painted in centre and border. Mark, Nant-garw and C. W., impressed.
- Ce. L. 3. Plate, with a basket of flowers painted in centre. Mark, Nant-garw and C. W., impressed.
- Ce. L. 4. Plate, with flowers painted in centre and on border. Mark, Nant-garw and C. W., impressed.
- Ce. L. 5. Plate, with roses painted in centre and in compartments on border. Mark, Nant-garw and C. W., impressed.
- Ce. L. 6, a. b. c. Three small cups in an unfinished state, two of which appear to have been experimented upon to obtain the *bleu de roi* colour of Sèvres.  
*Presented by Mr. Joseph Marryat.*

## NOTTINGHAM EARTHENWARE.

In Dr. Deering's Historical Account of Nottingham (1751) it is mentioned that Nottingham sends down the river (Trent) coals, lead, timber, corn, wool, and potters' ware; and in a list of trades and employments exercised in the town, with the number of masters in each, made in 1641, compared with one made in 1739, one potter appears in the former and two in the latter. At the present day no manufactory exists there, though certain old places in the town, which have derived their names from their proximity



to the potteries, still retain them, such, for instance, as Mug House Lane. The collection contains only one specimen of this manufacture.

Large brown earthenware bowl, with November 20, Ce. M. 1. 1726, impressed on the outer rim.

*Presented by Miss Lakin of Nottingham.*

#### LIVERPOOL EARTHENWARE.

No detailed information has hitherto been obtained at the Museum respecting this earthenware. It is known that potteries were carried on at Liverpool about the middle of the last century, and amongst them was one called the Herculaneum.

An earthenware salad bowl, with perforated work. Ce. N. 1.  
Flowers painted on interior border of dark pink coloured ground. Mark, Herculaneum, impressed.

Earthenware plate, with flowers painted on border of a dark pink coloured ground. Mark, Herculaneum, Ce. N. 2.  
impressed, and 1653 written in black.

*Both the foregoing specimens were presented  
by the Rev. Thomas Stainforth.*

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# LIST OF GEOLOGICAL MAPS AND SECTIONS OF THE GEOLOGICAL SURVEY OF THE UNITED KINGDOM,

PUBLISHED BY MESSRS. LONGMAN & CO. FOR HER MAJESTY'S STATIONERY OFFICE.

THE Maps are those of the Ordnance Survey, Geologically Coloured by the Geological Survey of Great Britain and Ireland, under the Superintendence of Sir HENRY DE LA BECHE, C.B., Director-General. The various Formations are traced and coloured in all their Subdivisions.

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\* \* The Geology of the Counties of CORNWALL and DEVON is amply illustrated by Sir H. De la Beche's "Report." Svo. 14*s.*

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