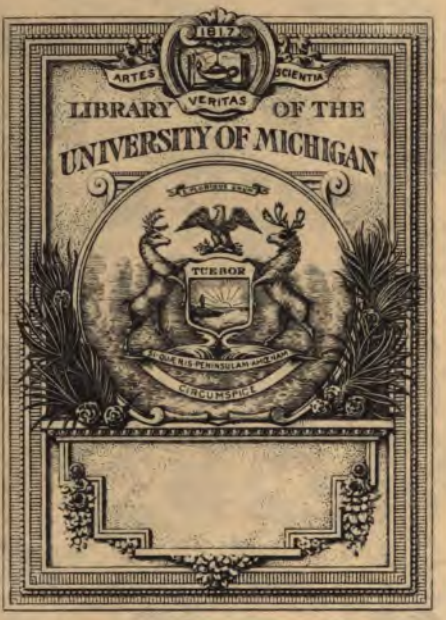
Potters,



"TOUCH ME NOT."

(From the Original Terra-Cotta by George Tinsworth, by permission of Messrs. Doulton & Co.)

POTTERS

THEIR ARTS AND CRAFTS

BY

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AND

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A PANEL BY GEORGE TINWORTH.

PREFACE.

THE most superficial study of the Potter's ar sufficient to suggest the immensely varied na of the interests — historical, ethnograph artistic, technical—involved in its consideration. M have been the volumes written upon the sub as a whole, or dealing with it in various sepa aspects. In fact, there is perhaps no other handic that can compare with this, in the extent to whic has been the subject of literary treatment. And th seems little reason to add yet another to the long of works dealing with pottery, except that there perhaps be room for a sketch that, without igno altogether the technicalities of the subject, will more especially with the craftsmen.

For the art of pottery is so essentially human! it, more than in any other, can we see the persona

of the worker. It is full of a vital interest, from its oldest and most shapeless relic down to the most modern and costly production from our huge present-day hives of industry. No other material has recorded, or can record, so faithfully as burnt clay, the minutest touch and individual feeling of the craftsman. Here, on a tiny cylinder, or a block of brick, disinterred but yesterday from the rude mound that covers the long-ago forgotten city of a vanished empire, is the little stamp that gives the name of the builder of the once majestic pile; here, scrawled across the base of a Greek cup is the name of artist and assistant, and the purpose for which the piece was made; here, on some queerly-shaped posset-cup of our own English manufacture of 200 years ago is an oddly spelt

> "God bless the Queen and Prence Gorgᵉ. Drink and be mery and mary: B.B. John Meir made this cup, 1708."

And there, lurking under the base of a beautifully finished vase of modern manufacture, we shall find the tiny impressions, little stealthy marks and modest monograms that record the share of each skilled worker who in turn helped forward its completion. Even on a Wedgwood vase—for Wedgwood sternly repressed any manifestation of individuality on the part of his workmen—there may sometimes be detected a mark by which an expert will identify the maker. It is remarkable, too, that these personal touches upon many a piece of old pottery, these revelations of the minds and habits of otherwise forgotten workers, will often throw

light upon doubtful points in the history of art and literature, and confirm in unmistakable language of form, or line, or colour, theories and speculations which, as far as literary evidence went, would have remained only theories and speculations. The gradual appropriation by the potters of one country of decorative features used by others, the sudden growths and cessations of particular styles of work, the different languages used in the inscriptions, even the variations in the forms of the letters composing the inscriptions — these, and similar details, have afforded a rich field of research for those interested in the history of the arts of civilisation. Little did the obscure potter of some bygone day dream that a chance production of his might in the far-distant future excite the keen attention of philosopher, artist, or chemist, and with its primitive art and quaintness help in the elucidation of history.

To carry art into the things of common life is not given to all. It is, however, the privilege of the potter to do this; he is fortunate in being able to ennoble the useful into the beautiful; and many a piece of homely ware produced originally with no idea but that of serviceableness, is now treasured for its simple beauty.

It is a commonplace of the historian to remark how very closely pottery reflects the degree of civilisation and artistic attainment of a nation. It is no question of wealth; costly materials are not asked for by the potter; he takes a common material and manipulates it with more or less skill, bakes it with more or less care, and there is the story of it embodied for all time.

Whatever there is of interest to us in the piece of work, the workman put there; the work has become the permanent expression of the worker's skill and taste—the material comparatively nothing; the art almost everything. Very often naïve and childish enough to our eyes is the art of a bygone day, yet its very imperfections are charming.

The Potter's art is at once the most unprogressive and the most progressive of arts. As its essentials are constant—clay and fire—it must always be recreating its ideals by continual contact with Mother Earth. Having its origin in very primitive needs, and utilising a very common and easily-worked natural material, it is not surprising that, even to this day, there should be races whose pottery is of very primitive type, scarcely, if at all, in advance of what was being made 6000 years ago. And yet, we have only to look at the varied manufactures, beautiful, useful, costly, or cheap, that our potters of to-day are producing, to realise that here we have an art that has been and is steadily progressing, adding to a practical knowledge whose precepts have accumulated through many centuries, a newer and more precise technical and chemical knowledge that is pointing out new materials, more direct methods of workmanship, and fresh fields for the manufacture to occupy.

J. C. L. S.

PALISSY-WARE DISH, WITH REPTILES AND FISH.

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ROMAN POTTERY.

POTTERS: THEIR ARTS AND CRAFTS.

CHAPTER I.

POTTERY PROCESSES, CLAYS AND KILNS.

IT would be desirable, before entering upon any historical sketch, to briefly summarise the characteristics of the different classes of pottery, and make some mention of the materials and processes involved in their manufacture.

The term "pottery" is, of course, applied to all objects formed of clay and hardened by the application of heat. It is certainly a very elastic term, and the master-potter of to-day covers a much wider field with his products than was ever dreamt of when *poterium* was Latin for "drinking vessel."

The essential constituent—clay—occurs in many

varieties. All owe their origin to the decomposition of certain rocks. Centuries of exposure to frosts and rains have split up and worn down the out-cropping surfaces of primitive granite-rocks, the fine silt being washed down the slopes of the hills and gradually deposited along the valleys below, often at great distances away. The purest clay, kaolin, is found at comparatively few places. Chemically speaking, it is a hydrated silicate of alumina, a decomposition of the felspar in the granite. Its more common designation, china clay, reminds us that till last century it was only known as forming the chief material of Chinese porcelain, and it was not till happy accident revealed its presence in Europe and America that true porcelain could be made away from China. Its chief source in England is in the neighbourhood of St. Austell, in Cornwall, and, next to tin, it is the most important mineral product of that county.

Pipe clay and potter's clay occur more frequently than kaolin. They contain a larger proportion of silica; and iron oxide, occurring in larger or smaller quantity, gives the clays their yellow or brown colour when fired. The chief sources of supply for England are the neighbourhood of Poole Harbour, in Dorsetshire, and Newton Abbot and Torrington in Devonshire.

With a still larger proportion of silica, the clays become suitable for architectural terra-cotta and tiles, the infusible silica counteracting the tendency of the

clay to shrink excessively or twist in the baking. Very valuable clays are found in thin seams among certain coal measures; thus, the fortunate potter digs his clay and his fuel from the same pit. Certain highly refractory fire-bricks used for furnaces are made from clays composed almost entirely of silica.

The more impure clays suitable for bricks are most abundant and varied in composition. The considerable proportion of alkaline matters — lime, magnesia, or potash — which they contain in combination with different oxides of iron, influence the colour to a marked extent. The range of tints available in natural-coloured clays is fairly extensive, running from pale-cream through orange, fawn, red, pink, grey, and blue; even the intense bluish-black of certain building-bricks being a natural metallic colouring brought out by over-firing.

When other tints than these natural ones are desired, certain oxides of other metals than iron are used to stain the substance of the clay; thus, blues of various shades are obtained from cobalt, greens from chromium, lilac, pink, black and brown from manganese, yellow from uranium, drab from nickel, dove colour by cobalt and manganese, and so on.

Very few clays are used just as they are found. They have to be "corrected" in various ways; to add or decrease stiffness, to render more or less fusible, or more or less refractory in the baking. Mixtures of

clays have, in the majority of potteries, to be resorted to, calling for all the skill and experience of the potter. In continually testing his materials, and experimenting and deciding upon the best use to be made of new sources of supply, the successful potter has to be more or less of a chemist.

For chinaware an artificial clay is used, built up of ground flints, kaolin, ordinary clay, and a large proportion of calcined bones. The use of the last-named ingredient (giving phosphate of lime) dates from the middle of last century.

All the natural clays have a certain amount of water contained in them. Of course, the plasticity of the clay, or its capacity for being moulded or pressed into different forms, is due to this moisture. Some of the moisture (*i.e.*, that which is "mechanically" combined) can be driven off by evaporation, but the plasticity is soon restored by adding water. Hence the sun-dried bricks used so extensively in ancient Egypt and Babylonia, and still used as *adobe* in Central America, retain their forms for centuries in the dry air of those countries, but would not have lasted a year in our more humid atmosphere. There is present, however, *water in "chemical" combination* with the clay—sometimes only in small quantity—and this, once expelled by baking, cannot be replaced. The burnt clay, though powdered as fine as may be, will not regain its plasticity on the addition of water.

Pottery may be roughly grouped into three main divisions, according to the nature of the *body* or substance (Fr., *pâte*):—

Earthenware.—Fired at low heats; earthy in texture; sufficiently soft to be scratched with a knife.

Stoneware.—Fired at high heat; hard, dense, and vitreous; not scratched by a knife.

Porcelain.—Fired at highest heat; still more vitreous, semi-fused, and often translucent.

It is impossible, however, to make a quite precise classification of pottery bodies; there are many intermediate conditions arising from the variable nature of the clays and their mixtures, or from the effects of varying degrees of heat. Some earthenwares can be fired so hard as to practically become stonewares, while some fine stonewares will exhibit almost the perfection and translucency of hard porcelain. As a general rule, it may be said, clays suitable for earthenware will not retain their form if baked harder than earthenware need be fired; similarly, a stoneware clay, if over-fired, is liable to fuse down into a shapeless mass; while for the highest heat of true porcelain only its special clays are available; clays that, as we shall see in the following pages, European potters were for centuries seeking in the attempt to rival the beautiful porcelain from China.

Such a simple grouping of pottery refers only to the *body*. An earthenware clay when baked will present an earthen and more or less porous surface, capable of

absorbing liquids, and easily soiled. Such a body is called *terra-cotta* (Italian, burnt earth), or *biscuit* (which really means *twice baked*, and is therefore rather inappropriate to a once-baked clay; the term *terra-cotta*, too, is now made to mean rather more than a merely baked earth, for architectural terra-cotta—blocks for building purposes—has to be fired hard enough not to be porous, as hard as stoneware in fact).

When pottery was first made, it must soon have been found that the merely baked ware was not altogether desirable for holding liquids. To invent a *glaze* then, or glassy covering, was a great step in advance, and the usefulness and durability of pottery have by the use of glazes been immeasurably enhanced; often, indeed, the glaze is of more importance, harder and finer in composition, than the body it may cover. The consideration of the different methods of glazing makes it possible to sub-divide the group of *earthenware* into—

(1.) Unglazed, as for instance, a common flowerpot.

(2.) Ware with transparent, glassy covering—

(*a*) *Alkaline*—as in Persian faïence.

(*b*) *Plumbiferous* (formed from *lead*)—as in Wedgwood's "Queen's" ware, and the "Oiron" ware.

(*c*) *Boracic* (formed from borax) — as in Staffordshire earthenware.

(3.) Enamelled ware, in which the body is hidden by

an opaque coating formed with tin — as in Della Robbia and Delft wares.

In a general way, divisions (2) and (3) may be spoken of as *Faïence*, and (3) especially as *Majolica*. These designations will be further dealt with when speaking of Italian pottery.

The group of *Stoneware* will also fall into three divisions of—

(1.) Unglazed—as in certain Chinese and Japanese wares.

(2.) Ware with transparent glaze (generally a salt glaze)—as in the common brown "hunting-jug," or "Doulton" ware. (This ware is sometimes referred to as "Brown Porcelain.")

(3.) Ware with enamelled or opaque covering (generally from the use of felspar)—as in, for instance, a cream-glazed stoneware kitchen sink. (Ware of this kind is sometimes styled cream-enamelled porcelain.)

Porcelain is divided into two well-marked classes, and these sub-divided according to their bodies and glazes:—

(1.) *Natural* or *Hard* Porcelain, in which the body is formed from kaolin (decomposed felspar), and the glaze from china-stone (almost pure felspar).

Occasionally, this ware is left in the unglazed or biscuit state, otherwise it is generally

glazed, as in the porcelain from China, Japan, Dresden, Limoges, and Sèvres.

(2.) *Artificial* or *Soft* Porcelains—

(*a*) *French.* — Body formed from alkaline materials (saltpetre, sea salt, alum, soda ash, gypsum and sand melted together, ground, and mixed with chalk and marl); the glaze also alkaline (composed of lead, sand, flint, soda, and potash). The old Sèvres porcelain comes into this class.

(*b*) *English* or "China," as it would be now generally styled. — Body of calcareous nature (bone ash, kaolin, china-stone or felspar, flint, and sometimes clay); the glaze generally boracic (formed with *borax*). Minton, Worcester, Derby, Bow, and Chelsea porcelains may be instanced as examples of this group. Some of the earlier bodies, however, approximate more in their composition to the French type, and the glaze contains lead. From the Derby, Chelsea, and Bow works proceeded many pieces (mostly statuettes) in unglazed biscuit of pure white. This leads to the mention of *parian*, an artificial body used for unglazed models, with a large proportion of felspar, and almost approxi-

mating in composition to the unglazed biscuit of hard porcelain.

A few words now as to the more obvious processes of manufacture, and it will be convenient to speak first of the simpler methods of stoneware.

The raw clays (principally the "blue," "ball," or potter's clay from Dorsetshire and Devonshire), are cut out from the pit in squared lumps. The deposits are at some distance below the surface, and the purest clay is the lowest reached; the upper beds generally contain more sand, and are of a nature that for some kinds of ware require but little preparation. The blue or grey tinge in the clay is due only to the stains from organic matter, and will disappear in the burning. Arrived at the pottery, the clay is stacked up and allowed to "weather" for a longer or shorter period. Some potters attach more value to this preparation than others; it is not uncommon for the clay, in some cases, to be used at once, while it has been stated that the materials for Chinese porcelain are allowed to weather for a great number of years.

All materials are well and thoroughly ground. At all stages of the manufacture there must be good workmanship; if the clay when used is not quite similar throughout—perfectly homogeneous—inequalities will manifest themselves in the firing. The lumps of dry clay are ground to powder under pairs of iron runners; the powder falling over the edge of the pan

is sifted automatically, the coarser particles are returned for more grinding, and the fine dust is carried off by buckets on an endless chain to a receptacle from which it is fed as required into a "blunger" or mixing-pan. Here is added a due proportion of ground "rough stuff" (broken burnt ware which has also been "under the runners"), water is poured in, and a rough sort of mixing takes place, the revolving arms of the blunger churning the mass over and over. It falls into a "pug-mill," whence, having been squeezed in and out, and cut through again and again, it is forced out in a condition almost ready for use; sometimes, however, where finer work is intended, it is again fed into a second pug-mill. The plastic clay is now ready for the "thrower's wheel," or the "squeezing-box," or the moulding-bench. Such a clay would be described as *unwashed*.

For fine stonewares, and for earthenwares, the clays are *washed*, and the processes now to be described take place in the *slip-house*. The ingredients—we will speak of those for earthenware—having been prepared separately (the ball clay and kaolin in the blunger, the calcined flint and cornish stone brought to fine slips in the stone mill), are all fed into the mixing-tank. The density of each has been carefully tested (the weights per pint averaging respectively—kaolin, 26 oz., ball clay, 24 oz., flint, 32 oz., cornish stone, 31 to 32 oz.), and the right quantities having

been measured, and any colouring stain added if desired, the mass is stirred together, strained through lawns of graduated fineness, passed along a trough in which magnets are suspended that any lingering iron may be caught, and so to a store tank. From here the mixture is pumped up to the *press*, which is an elaborate arrangement of wooden frames (usually twenty-four in number) placed up on edge in a row. Each frame has a *cloth* of specially woven material, folded to form a kind of flat bag, each with a small feeding pipe communicating with the main supply. Long clamps hold the frames all together. The pump being started, the slip is forced into the frames, the excess of water filtering out through the cloths and running away in the channels under the apparatus. When the water ceases to flow, the pump is stopped, the bolts are loosened, the frames opened, the cloths unfolded, and the soft clay lifted out. This is not a rapid process, and where the bodies are varied in colour or otherwise, the cleaning of the filtering-press occupies some time. The clay—not yet suitable for use—is fed into the hopper of a pug-mill, in which it is compressed still further and beaten together. Exuding from the mill in a fairly solid stream, it is carried away to the "makers." Even there it is still further beaten and tossed about so that any imprisoned bubbles of air may be expelled before the "thrower" will use it. This final cutting and throwing together again is

called "wedging," and is splendid exercise for the arms of those who have to indulge in such violent labours.

There are, of course, minor details in the preparation of clays that it is impossible to mention. Not all will need such careful treatment. A clay intended for bricks will not perhaps pass more than one mill. Some rough clays used for squeezed wares can be put just as they are dug from the earth into the squeezing-box, while some fire-clays entail a kind of "steaming" operation. The clay in this case, having been ground up and the due proportion of broken stuff added, is mixed in water, and run out along a sloping trough with slight hollows in its surface. Here the coarser particles settle; what passes over goes to an iron tank surrounded by a steam-jacket. The excess of water being evaporated off, the clay now goes through a pug-mill, or is beaten by hand.

Most of the old and arduous hand-methods of clay preparation have been fortunately given up in favour of machinery.

Much can be said of the various ways of *forming* pottery. The most characteristic, and certainly the most interesting to watch, is that which is known as "throwing" on the wheel, one of the oldest of processes in the world. As represented in a wall painting at Beni-hasân, the ancient Egyptian potter squatted on the ground, and turned his wheel by one hand

"THROWING."

while forming the vase with the other. The Greek wheel was turned by the foot, a method that was in vogue until quite recently. Where steam-power is available, it is but natural to use it for small and quickly-made articles; but larger vessels and anything requiring extreme care are still "thrown" on a hand-wheel, the motive power being supplied by an assistant, who can turn faster or slower at word of command, and leave the thrower to concentrate all his attention on the work in hand. The idea of the wheel is simplicity itself: a horizontal revolving disc, the fingers of the workman, and the lump of clay between them—that is all. Thrown on the centre of the disc, the ball of moist clay is manœuvred as it revolves by those skilled fingers;—"opened out," brought in again, brought up to a neck, mouth turned out, lip formed by a touch of the finger—and there is a jug complete all but for the handle. A few simple bits of horn to clean off with, a gauge for height to be used or not as the case may be, a wire to sever the object from the wheel, and a pan of water, and that completes the "thrower's" outfit. A most fascinating handicraft, and one that numbers among its humble followers many a real artist!

Many common articles (of circular form, it must be understood) are finished on the wheel. Such would be ink-bottles, ginger-beer bottles, and so on. An approved pattern having been weighed, the same

weight of clay is made to reach to the same height in each case, and it will be found that the capacities do not very appreciably vary. Most pieces, however, require to be "lathed," to remove any excessive thickness, or any irregularities of surface. This can easily be done, as soon as the clay object has acquired sufficient stiffness by drying. It has been sometimes objected that this second process of lathing destroys the characteristic feeling of a "thrown" piece of work, and this is, without doubt, true. But it is also true that by lathing we can have shapes more light and graceful than could be made and finished on the wheel, for the clay at first is so soft that a certain thickness must always be left in order to avoid a collapse.

So far, these are interesting crafts. But now we come to the mechanical "potter." At many a pottery you will not see a "thrower" at all. How, then, do they produce their circular articles? The ingenuity of the machinist has solved the problem, and it would be ungenerous to lament the advent of machinery while we enjoy a cheap dinner-plate or cup and saucer. Cheap crockery is a great civilising agent, and the mechanical potter confines his attention, for the most part, to the production of useful articles that have to be made in large quantities, and are sold at low prices. For the making of a plate, the head of the throwing-spindle is fitted with a humped block shaped to the inside of the plate. On this hump is placed a thin

layer of the clay, pressed into form as the spindle revolves by a fixed metal rib shaped to the outline of half the back of the plate. The space between the hump and shaped rib is regulated by a set screw, and plate after plate can then be turned out, each to the same thickness. It was the uniformity of shape in his useful productions that brought to Wedgwood his early reputation, and the same merit of absolute similarity still attaches to most English china for table use.

With cups, and other vessels of deeper form, a revolving mould is used for the exterior, and the interior is finished by hand. Crucibles are made in the same way; here, however, the mould is lined with a removable bag of canvas before the clay is put in; the inside is formed by a shaped arm hanging down into the interior, and capable of adjustment so as to leave the intended thickness of clay. Bottles and jars are now often made in the same way, the necks being narrowed in by hand after the shaping-rib for the body is withdrawn. Oval objects are also made in a revolving mould, the forming arm for the inside being made to follow the required curve by means of an eccentric.

A most important method of forming articles is by moulding them in moulds made of plaster of Paris. The first model of the shape having been made in clay, plaster, or wood, the mould is formed round it in convenient sections, each accurately fitted to its neighbour. Larger articles are *pressed* in such moulds;

the clay, roughly batted out in sheets of a certain thickness, is placed in the mould, and well thumbed into all the corners. The plaster soon absorbs water from the clay, thus causing the clay shape to shrink away slightly from the mould, which is then opened, and the object taken away to dry after the seams have been cleaned off. The marks of the seams can generally be discerned on a moulded article, however carefully the work may be done, and it is sometimes surprising to see these seams on a circular shape that could have been better "thrown" on the wheel. The plaster moulds are very cumbersome and bulky, and the storage-room necessary for their safe-keeping must be a serious tax. So fickle, too, is fashion that it is always calling out for fresh patterns, and a set of moulds that may have cost a large sum of money may only run for one season, and then be useless.

Moulds are also used in the process of slip-casting. Statuettes and light fancy work are generally made by pouring the liquid clay into the mould, and, after sufficient time has elapsed for a certain thickness of clay to have settled against the sides, the remainder is poured out again. In these, again, the absorption of the water by the plaster soon releases the casting, and the mould can be emptied and used again. Slip-casting, however, soon spoils the moulds, as the clay has to be used in so liquid a condition, and if any large number of a particular model is desired, the workman has to be pro-

vided with a duly large number of moulds identically made, which he will fill and empty in orderly rotation.

Enrichments, such as ornamental handles, spouts, and shaped lips, are moulded separately, and attached by fluid clay to the object they were designed for. Plain handles for common jugs are "pulled" out between the fingers, a quick and pretty trick to watch when a skilled workman is engaged upon it.

A further method of forming clay objects is by mechanical *expression*. Such, for instance, as drain-pipes, channel-pipes, coping tiles—in fact, anything of identical section throughout its length, may be squeezed out when plastic through a *die*. The clay is fed into a cylinder, in the floor of which is an orifice of the exact shape desired, the core—if it is a pipe or other hollow section—being held by bridges so placed as not to interfere with the passage of the clay. A descending piston forces out the clay in a stream, which is cut, as it exudes, into suitable lengths. The addition of a socket to the pipe does not much complicate the process. An iron mould of the socket is held against the bottom of the press, so that the clay as it travels down spreads out and fills the mould. Directly a thin jet of clay comes from the pin-hole left for the air to escape, the attendant knows that the socket is fully formed, and he commences to lower the mould away from the mouth of the press. It is followed by the stream of clay in the form of the pipe of its proper diameter.

The desired length is cut through by a wire, and lifted away for cleaning off and drying.

The modern science of sanitation owes not a little to the stoneware drain-pipe, now one of the most common objects of the street. The commercial manufacture of this highly useful—if not very ornamental—example of the potter's trade is of comparatively recent origin, Sir Henry Doulton having been the first—just fifty years ago—to start a factory equipped with specially-designed machinery for its production. The use of stoneware for this purpose has suggested its application to all kinds of utilitarian requirements in chemical, distilling, electrical, and many other industries, and it would be difficult now to point to any manufacture or trade in which stoneware or other pottery does not somewhere find a use.

Machinery is now used for moulding tiles and tesseræ (or cubes) for mosaic pavements. The floor tiles made in mediæval times, of which so many beautiful examples remain in our cathedrals and churches, were made in wooden moulds, the ornament being filled in first in one coloured clay, and then another coloured clay run in in a liquid state to form the background of the pattern and also the substance of the tile. The tiles were cleaned off, dried and fired, and glazed with a lead glaze. Both body and glaze were soft, and, although good in colour, not adapted to stand much wear. It is only where the old tiles have been buried, or placed in

TILE PRESSING.

some position where they were not walked upon, that the patterns are now at all clear. It was in 1840 that Mr. Prosser, of Birmingham, patented a process of making buttons from dry porcelain powder, using steel dies in a strong press. The idea was suggested to Mr. Minton that mosaics and tiles could be made in a similar way; and by the year 1844, the process was worked out in conjunction with Mr. Blashfield, machines being built to produce tiles and slabs of large size.

The clays are prepared in the same way as for plastic work, but are then dried again and ground to powder. The metal box or die is filled with this powder, which has been very slightly damped; the workman gives the overhead flywheel a vigorous twist, and the vertical screw brings down the plunger with great force into the die. A twist in the reverse direction, and the plunger rises again; at the same time a lever, worked by the foot, causes the bottom of the die to rise and lift the clay, now compressed into a tile, clear of the box. Any slight roughness along the edges of the tile is soon removed, and the tile is carried away to join its fellows in the drying-racks and subsequent "biscuiting" and glazing.

The average size of a wall-tile is a square six inches by six inches, and large quantities of these are now manufactured for decorative purposes. They are easily attached to walls, especially since the recent introduc-

tion of a method of keying or "undercutting" the backs to enable the cement to have a better hold. Floor-tiles are generally preferred unglazed, and the body for these is a mixture of barytes and clay; this fires extremely hard, and vitrifies throughout its substance, so that, should the surface wear through, the same colour will still be visible.

Of brickmaking, whether by the dry or plastic methods, and of brick-burning, we have hardly space to treat. We must, however, mention the continuous kiln, or "Ring-oven," patented by Friedrich Hoffmann in 1858, as introducing the valuable economy of utilising what would otherwise be wasted heat, in drying the contents of adjoining ovens.

Having dealt with various methods of forming pottery, we can now turn to the subject of baking or firing it. As may be supposed, there are many different forms of kilns, according to the class of ware and the amount of heat required. For the larger proportion of pottery manufactured, for all earthenware and china, the firing has to be done in instalments. The ware is first baked as terra-cotta or biscuit, and is then, having been decorated or not in the interval, dipped in a glaze and fired in a second kiln for the glaze only. Some wares are complete at this stage: others may be intended to receive other decoration in colours placed over the glaze, which require to be fixed permanently by firing the ware in a third kiln—the "enamel-kiln."

Still other decorations may be used, other enamels or gold, and these will necessitate fresh firings. Each kiln in such a series of burnings goes up to a lower heat than its predecessor, in order not to spoil the effect by burning out some of the more delicate colours. Each degree of heat involves a different set of colours, many that are perfectly safe at a low temperature being burnt right away, or seriously impaired, by a greater heat. No colour that is not fixed by heat can be seriously looked upon as a pottery-colour; and it is not surprising, therefore, to hear a potter laugh disdainfully at the brilliant effects obtained by the use of oil-colours painted on red biscuit-ware in a style that was much in vogue among amateurs a few years ago.

Preparatory to the biscuit-kiln there is of necessity a drying-room. The ware might be allowed to dry naturally, but who would wait for this? The drying, also, must be quite complete — the ware must, in potter's language, be "white hard"—or damage will inevitably be caused in the kiln by the steam thrown off by any lingering dampness. The old form of drying-room was a close, brick-built box, with a stove in the middle, and shelves all round; boys had to enter the heated atmosphere with the trays of pots, and arrange them, and remove them when "fit." Very unhealthy work it must have been. Now, in most well-appointed factories, a large revolving cage is used, which fills the whole drying-chamber, the shelves

being accessible in turn, as the revolution of the cage brings them opposite the doorway or small shutter.

Being dry, the articles are now carefully placed in fire-clay boxes, called *saggers*. The coarse clay of which these are composed is highly refractory, and serves to protect the enclosed articles from unequal heating and smoke. The saggers are piled up in stacks in the kiln, each stack called a *bung*, and there may be forty or fifty bungs in a kiln of average capacity. The door to the kiln is then bricked up, and the fires lighted. Certain contrivances and dampers enable the fireman to control the heat and direct the currents of heat in the right direction. It is most usual now to use "down-draught" kilns, in which the heat from the fire-holes is first directed up the sides of the kiln, and then drawn down through holes in the floor, and away underneath the floor, to a separate shaft, which may serve for one or more kilns. The test-pieces being drawn at intervals, showing that the right heats are being obtained, which will happen in from forty to fifty hours, the firing is stopped, the fire-holes bricked up, and the whole left to cool for forty-eight hours or so. This cannot be hurried; if the kiln is opened too soon, the contact of cold air may cause the still warm ware to "stunt" or fly. The saggers are carefully unpacked, and, if sound, are used again; the contents are taken away to the biscuit-warehouse. In a large pottery the stock of pure white biscuit-ware is

of necessity large, and very imposing it looks in its ordered array. Here it waits in turn for decoration and glazing.

At this stage, stoneware has a great advantage over other pottery. It is usual to bake it and glaze it in only the one operation, stoneware clays admitting of this fiercer ordeal. The kilns are of slightly different construction from those for earthenware, the heat desired being greater. They are built in both forms, down-draught and up-draught.

Instead of placing the ware in saggers, it is the rule to build up with slabs and props of fire-clay open shelves in tiers, filling them with ware as tier after tier is built over until the crown of the kiln is reached. Extra large pieces will interrupt the orderly arrangement of shelves by the increased space they require, but the greatest economy is displayed in utilising every corner by filling in with smaller articles. Every object must remain perfectly upright, or the great heat will cause it to melt sideways, and perhaps spoil other pieces beside itself. The pieces are prevented from adhering to the shelves by standing them in flint-dust, which remains infusible.

For salt-glazing, the articles receive the full force of the open fire; the flames play directly into the kiln and circulate through all the shelves and cupboards. When the highest temperature has been reached, common ground sea-salt is thrown into the kiln by means

of the fireholes and little holes specially left in the crown of the kiln. This operation is performed as quickly as possible in order not to check the heat of the kiln by admitting cold air, and the holes are at once bricked up again. A comparatively small quantity of salt—not over two cwt. for a large kiln—suffices. During the moments of salting, a dense vapour of hydrochloric acid emerges from the shaft, and if one happens to be in the neighbourhood of a salt-glaze pottery at the time, one finds the air by no means pleasant. Although assumed to be deleterious to plants, the vapour is by no means so in the case of human beings, for the vicinity of the potteries is singularly free from epidemics.

Salt-glaze, although obtained by such simple means, is chemically and technically superior to other glazes, in that it is really the ware itself that fuses. The salt is volatilised in the intense heat, the chlorine escaping in vapour, and the sodium combining with the silica naturally present in the clay to form a glass of silicate of soda, which covers all the exposed surfaces of the ware with a wonderfully fine film of intensely hard glaze. Sometimes a little manganese is added to the salt to induce a better colour, or a little lead to increase the fusibility. The purer the clay the less readily will it glaze, and it often happens that the finest examples of salt-glazing may be found among the common drain-pipes or sanitary ware.

"DRAWING" A KILN.

Those stonewares that are intended for cream-enamel (at first known as "Bristol" glaze) are dipped, when in

the dry clay state, into pans of the prepared liquid glaze. This is a mixture of felspar, borax and oxide of lead, and may be described as a rough kind of porcelain glaze. The porous clay soon sucks the water out of the coating of glaze and evaporates it, leaving the materials in a dry film on the surface of the article, which is then carefully placed in the kiln. The stacks of ware are not so exposed to the fire as in the salt-glaze kiln, the products of combustion passing up the sides of the oven within small flues called *bags*. The materials of the glaze in melting combine with the body, and produce an opaque glaze of great hardness and evenness.

A variation in either of these stoneware fires is the kind of semi-glaze known as a "smear." Trusting to the volatilisation that takes place in the kiln, a piece of ware—otherwise unglazed—if placed in the vicinity of a glazed object, or with the materials for glaze placed in a dish or sagger alongside it or enclosing it, will be found after the firing to have caught a faint polish or "smear" of glaze.

The stoneware kilns are generally of large size, and may take from seven to fourteen days for each burning, from the "setting" of the contents, through the periods of firing, cooling, and "drawing" again. One of the kilns at Messrs. Doulton's Lambeth Works is known to the men as "St. Paul's," on account of its size; it has a capacity of 29,000 cubic feet, and each burning consumes about thirty tons of coal. Another kiln of square

shape at the same works was built specially for burning bottles, and will accommodate at one time nearly 40,000 ginger beer bottles.

The upper parts of the large stoneware kilns are often utilised for burning terra-cotta, or unglazed, wares. Statues, architectural enrichments such as cornices, medallions, capitals, panels, and even the common chimney-pot innocent of all ornament, are carefully placed in position, and propped up, where of complicated form, by slabs and props of fireclay. Needless to say, accidents will happen, however carefully guarded against, and the slight displacement of a brick or bit of slab during the burning, may chance to give a list over to one side or other that may convert the heroic pose of some statue into a ridiculous stoop. The behaviour of the clay when it shall have reached its half-melted condition has to be calculated for; the characteristic of all clays to "shrink" in the fire, introduces complications of considerable extent. An object of any size will shrink more in height than in width, owing to the influence of gravitation; the average amount of shrinkage over all is a matter of experiment and experience, and every clay has its own rate of shrinkage. Thick and thin portions will shrink differently. Pieces that have been "thrown" on the wheel, and in which the clay has, therefore, more or less of a spiral direction, will untwist themselves in the burning, and cause all attached portions, such as handles and

spouts, to lean sideways in a disreputable manner, unless this painful tendency has been neutralised by sticking them on crookedly in the opposite direction. Still further, the potter has to see that the thickness of any piece is fairly uniform in itself; there may be no sudden lumps of clay in one part, and then a thin space next to it—the result of this would be that the thin part would split. No thickness of much more than an inch is ever left in anything, however large it may be; the largest statue will be all carefully hollowed out within, and strutted across and up and down with walls of clay to keep it from sinking out of shape, and where there may not be quite room enough for such a hollowing out, as in a finger or hand or small head, there will be drilled into it a long narrow hole to let the steam and air escape. The amateur modeller who wishes to have his attempts fired, that they may remain "a joy for ever," often forgets to build up his models in a business-like manner, and is sometimes disappointed to find that in the firing they have blown out of shape or gone to pieces.

With the great majority of wares, however, as has already been stated, the first firing is not all that is requisite; there is still a great deal to do. The biscuit ware admits of decoration by painting or printing; for the moment, we will leave the consideration of the various methods of such decoration, in order to complete our account of the kilns. The pigments with which

the decorations have been executed are all mixed in vehicles of an oily nature, and a most necessary step is to fire this oil out lest it should throw the glaze off in the subsequent glaze-firing. This is done in what is called the "hardening-on kiln," a muffle-kiln being used and fired up to a red heat only—just sufficient to burn away all the oil and fat without disturbing the colours. This firing is a matter of only a few hours.

The articles to be glazed are then dipped in the liquid glaze, the materials constituting it having been previously ground up to the finest possible condition in water and gauged to the proper consistency by means of a "twaddell," or hydrometer (on the same principle that milk is tested by a lactometer). The workman keeps the contents of his dipping tub continually stirred, that none may settle, and carefully grasping the piece, dips it in in such a way as to ensure a uniform thickness without any streaks or drops. Places where the fingers have been are completed by pencilling them. Plates of a larger size than can be conveniently gripped are held by hooked thimbles fastened on the fingers.

The glaze soon dries on the porous ware, and the pieces are then placed in saggers again, and carried to the glaze-kiln or "glost-oven." Coated as they are in a glaze which presently is to melt into a glassy surface, the articles now have to be supported in such a way as not to stand any risk of adhering to each

other, or to the saggers. For this purpose, specially-made props are used, known, according to their shapes, as stilts, spurs, cockspurs, triangles, and so on. On many a common plate may be discerned the three little points marking the places where it rested on a triangle in the kiln.

The consideration of pottery glazes raises many interesting technical points. The usual method of applying the materials of the glaze is, as has been seen, by dipping, the mineral constituents of the glaze being held in suspension in water. The glaze-forming materials can, however, be applied in other ways, one very old method being that of dusting them on in powder.

The object of all glazes is, of course, to form a glass upon the surface of the ware. In salt-glazing, this glass is formed with the aid of the body itself; with applied glazes, no such close union with the body is possible. But it is none the less necessary that the glaze, although not formed from the body, should have the closest possible affinity with it. A glaze that has a tendency to contract in the burning to a greater extent than the body on which it is placed, commits the unpardonable sin of "crazing." Ugly cracks, extending in all directions, will be seen upon the surface, and flakes of glaze may come away altogether. Any wares for domestic use that are crazed are simply unsaleable; their use proves objectionable, inasmuch

as acids or decomposing juices find their way through the crevices, and are absorbed by the porous body, which it was the special duty of the glaze to protect. It is, therefore, of the greatest importance for the potter to use such a mixture of glaze-forming materials as shall behave satisfactorily in this respect; and, as the number of different bodies in use is large, the number of variations in the glazes is also considerable. One or two glazes may be mentioned in detail. The following is given as the recipe for a common faïence glaze for earthenware:—

White lead, ...	53 parts.
Cornish stone, ...	16 „
Flint, ...	36 „
Powdered glass, ...	4 „

Here the lead forms a large proportion, and the glaze generally will be soft and easily fused. (It is, by the way, being gradually recognised, by the men as well as by the employers, that to work with lead glazes is not altogether favourable to health. Where they must still be used, the greatest precautions should be taken in the direction of cleanly habits, use of respirators while at work, no partaking of food in the work-rooms, and so on. Part of the danger to health can be got over by "fritting" the materials first; while in some potteries the lead glaze is being given up altogether in favour of more difficult mixtures containing no lead.)

We have just mentioned "fritting." A glaze, all the materials of which are ground together in water just as they come to hand, is called a "raw glaze;" all the substances will be about equally fusible together. But a glaze may have to be composed of materials, some of which are harder than others, and which there would not be sufficient time during the firing to thoroughly melt. The fusing, in such a case, is therefore assisted by melting together beforehand the more intractable materials. This is done, if in small quantities, in crucibles or saggers, or, if in larger quantities, in a small reverberatory furnace called a "frit-kiln," from which the molten contents are run out into a pan of cold water. The sudden cooling splits the glassy mass up into fragments; these are then ground to powder in the mill, and mixed with the remaining ingredients. A glaze prepared in this way is the following, used for fine earthenware:—

Borax, ...	30 parts.
Kaolin, ...	5 „
Calcic carbonate, ...	20 „
Cornish stone, ...	30 „
Flint, ...	15 „

These are fritted, and then in the proportions of 50 of the frit to 25 Cornish stone and 25 carbonate lead, ground together finally.

A harder glaze than this—one used for china—is:—

Borax, ...	24 parts.
Calcic carbonate, ...	20 „
Cornish stone, ...	48 „
Potassic nitrate, ...	4 „
Sand, ...	4 „

These are fritted, and 60 parts of it added to 24 Cornish stone and 16 carbonate of lead.

An easily-fusing earthenware glaze, containing no lead, and described as a safe old Shropshire non-poisonous glaze, is given thus :—

Felspar, . . .	27	parts by weight.
Sand, . . .	4	
China clay, . .	3	
Borax, . . .	18	
Soda, . . .	3	
Nitre, . . .	3	

These have to be fritted; then to the frit is added 3 parts of borax already calcined.

The nature of the glaze for the old Sèvres soft paste porcelain has already been indicated. The glaze for hard porcelain is china-stone, used in almost its natural state, being, in fact, a kind of natural glass; it has to undergo prolonged grinding and very careful sifting, and does not fuse properly except at a very great heat —the highest used in pottery. Being of the same chemical nature as the body to which it is applied, there are no difficulties to be feared in the way of "crazing"; the shrinkage is identical (at Sèvres the

hard porcelain shrinks 17 per cent. in all). The difficulties are more to be found in the intense heat which is necessary to fuse the glaze; a heat more than enough to fuse the body alone, and, therefore, tending to melt it out of shape.

In view of the fact that "crazing," or disparity between glaze and body, is so dreaded by most potters, it is amusing to find that, for some classes of decoration, it is eagerly sought by the Chinese and Japanese. Their "crackle-ware" owes its effect to a purposely-planned disagreement between the ware and its outer covering; and they can reckon on obtaining a crackle of larger or smaller figure, sometimes obtaining different varieties on the same piece. In the case of porcelain, where the glaze will not, of itself, craze, they will make it do so, by adding some baser material.

Mention has been made of the saggers in which the ware for glazing is usually placed. Where smaller quantities have to be fired, a "muffle" kiln is used. This may be described as answering the purpose of a very large sagger. A room is built up with fire-clay slabs within the kiln, so that the flames may play all around it without coming into contact with the ware, access being obtained to this inner chamber by a doorway, which is closely bricked up during the firing.

And how can the fireman possibly know what is going on within this closely-shut kiln? A skilled

"burner" is a very valuable personage in a pottery; however zealously others may have laboured in the making and decorating processes, all may be wasted if anything goes wrong in the firing. The necessary experience is, of course, only gradually acquired, and acquired in no easy way. A long-continued firing may mean nights and days of continuous watchfulness; an involuntary slumber may mean the letting-down of the heat, and the spoiling of the contents of the kiln; careless stoking will mean waste of fuel and time. It is usual to gauge the rise of the temperature by using "test-pieces," placed conveniently for withdrawal through a small orifice, which can be opened and closed quickly. These test-pieces are of different forms, according to the kiln: for the glaze-kiln they are generally small fragments painted with the glaze; for the enamel-kiln, little slips or cylinders painted with a very sensitive colour, usually carmine, which, under very slight increases of temperature, passes through various tinges, from dull-red to bright rose-pink, and, if overfired, changes to purple. Three or four of these tests drawn at intervals will indicate the gradual rise of the heat in the oven.

The only kiln now remaining for mention is that in which enamel colours are fired. This is also a muffle kiln similar to the last-named, but generally of smaller size, in order that the firing, which does not go up to any great heat, may not be too prolonged. At the

same time, the firing cannot be hurried or the cooling rashly shortened; the sad result of any injudicious haste in either would probably lead to "stunting" or cracking the ware. This defect is a particularly dreadful one to contemplate; the piece may appear to be perfect on drawing the kiln, but on sounding or ringing it, a jarring, dulled note will make it evident that appearances are deceptive. The too rapid cooling, or some defect in the body, has brought about a state of tension, from which the piece frees itself by the summary process of cracking.

Methods of pottery decoration are exceedingly varied and numerous. It would be quite impossible to deal with them in detail, but they can be grouped in some rough way.

The plastic nature of the body will suggest the first group.

Dealing with the shape only, a piece may be squeezed, crimped, bent, twisted, fluted, or dealt with in other ways while it is still soft on the thrower's wheel; or it may be thrown in mixed coloured clays instead of a plain colour.

On the lathe, it can be manipulated in all kinds of patterns dear to a turner. Bands and ornamental "runners" may be applied, to be either left plain or filled in with coloured clays. Fancy lathing is often indulged in, parts being turned up separately, and then stuck together with liquid clay.

While plastic, effects may be got by stamping the surface, incising on either the plain surface, or through

TURNING.

a coating of slip so that the body colour shows, painting in slip or colour on the plain or coloured surface, modelling above the surface, or carving back from the

surface, carving completely through the substance, or any of these in combination.

Then, according to the clay used, the piece having arrived so far is fired with or without a glaze, being either complete at this stage or waiting for further treatment.

The biscuit ware to be decorated involves the use of what are called "*underglaze colours*," specially prepared pigments that will withstand the amount of heat necessary to fuse the particular glaze in use. The harder the glaze-fire is, the fewer the colours available. The oxide of cobalt appears to be the only one that can be used under the glaze of hard porcelain. For the less hard glazes, other oxides of metals are brought into use—copper, iron, nickel, manganese, and chromium. They give different shades according to the kind of glaze used; thus, the turquoise blue of copper will only be developed under an alkaline glaze, and manganese, which gives a purple with the same alkaline glaze, gives a brown with a plumbiferous glaze. Painting in underglaze colours is considered more difficult than the other varieties of ceramic painting; the colours, when put on the ware, do not have the same appearance they present when fired; the changes and reactions of one colour upon another, and their behaviour under the different conditions of body and glaze, have to be learnt by long practice. To use Opie's famous answer, the colours have to be "mixed with brains."

As already stated, these pigments are used with a vehicle of oily nature, such, for instance, as the fat oil of turpentine. The biscuit ware is washed over with size before commencing the painting, in order to stop the suction of the porous ware.

In the case of table ware and toilet services, the patterns are applied (when underglaze colours are used) by *transfer-printing*. The colour is mixed up with oil, resin, tar, etc., into a stiff ink. A copper-plate bearing the engraved pattern—due allowance having been made for the wrapping over of the design on the curved surface of the ware—has the lines filled with the colour. A special make of tissue paper, cut to the size, is soaped and damped, placed on the copper-plate, and passed through a roller press, which prints the design on the paper. This is in turn laid on the ware, any chance misfits in the pattern being as skilfully disguised as possible by cutting and piecing, the decoration being transferred by dabbing, and the paper stripped away. The oil having been burned out in the "hardening-on kiln," the piece is dipped in glaze and fired. A peculiar effect known as "flowing" is sometimes resorted to, to take away the somewhat mechanical look of a printed pattern; this is obtained in the glaze firing by placing in the saggers, cups containing a mixture that will volatilise, such as lime or chloride of ammonia, and in the vapourous air of the kiln the lines of colour will swim and blur, soaking

partially into the glaze, and softening the hard effect of the print.

Here it may be convenient to mention a method of decoration that stands somewhat apart—namely, the faïence or majolica, the painting of which is done upon the raw enamel. In ordinary underglaze painting, the colours are laid direct upon the biscuit ware, and the colour of the ware (if it is coloured) shows through the glaze, thus making it desirable that the body used should be of fine texture and appearance. In majolica, the body is hidden under a coating of what is called *tin enamel;* it is really a lead glaze, thickened and rendered opaque white by the admixture of oxide of tin. The biscuit ware is dipped in this and left to dry; upon its absorbent surface the artist with rapid and certain touches paints his decorations. No retouchings are possible upon this unfired powdery coating; the work has to be direct and unhesitating. Fired in the glaze-kiln, the colours are fixed in the melted enamel.

A striking development of majolica is lustre-painting, in which a beautiful iridescence is produced by the sheen of certain metals. The effect may have had its origin in accident; a careless smoky fire may have brought about the particular condition of things resulting in a lustre, and the suggestion once seized may easily have led to its complete adoption. The idea in its production is to bring about, during the firing, what is called a "reducing atmosphere." When the ware is

at a dull red heat, a thick smoke is made in the kiln. The colours on the ware—which are, as we have seen, oxides of metals—part with some of their oxygen, and are reduced more or less to a metallic condition, which gleams out through the remaining colour. Copper treated in this way gives a splendidly rich ruby-red lustre; silver, a yellow lustre. On opening the kiln, the pieces are found covered with a black mess, which, cleaned off, may often show that the smoking has been over-done, and the pieces spoiled. The process is very uncertain in its results, and owing to the number of failures a good piece is apt to be costly. Though much used in the middle ages in Spain and Italy, the method now has but few followers. The common lustred pottery now produced in Mexico, and sometimes to be seen in our shops, is said to have its peculiar sheen caused by the ware being placed as soon as fired under heaps of stable manure, where it is left for a lengthened period. The ammoniacal fumes attack the common lead glaze with which the pieces are covered, and partly decompose it, causing an iridescence not unlike that of the ancient glass, which, long buried in the earth, is found to have acquired in its partial decay the most delicate prismatic tints and flushes.

Another class of decorations is obtained by using *coloured glazes*. Very brilliant effects are given by mixing the colouring matter in the glaze instead of painting it on the body and then glazing over. No

great delicacy of manipulation is possible in this method, and no mixtures of tints can be attempted; but glazes may be run into one another in daring contrasts. They are sometimes rendered opaque by the addition of oxide of tin, and in this condition approximate more to the class of *enamel colours* which now remain for mention.

This is a very large group of glass pastes or colouring matters formed from oxides of different metals and mixed with a flux. As a rule, they do not require a high temperature to melt them; they are therefore reserved till the latest stages of pottery production, and applied upon a surface that is already glazed. The name of *overglaze* or *onglaze* is borne by the whole group. The range of colours available is very great; practically any colour is obtainable, and in fact, such elaborate and finished effects are attempted as to lead one sometimes to entertain the feeling that pottery so decorated has overstepped the line of good taste and appropriateness. Enamel painting over glaze is so much easier than other kinds of decoration that its very facility is liable to become its ruin, and meretricious effects be sought at the expense of permanence. Underglaze decoration may be, and is, much more difficult and limited to a narrower range of colour, but its results are at all events imprisoned under the glaze and permanently enshrined; but colours painted on the glaze are very rarely thoroughly fixed by the lower

heat, and may often be scratched off and worn away by use.

It will be interesting to name the metals from which some of these bright colours are obtained.

Iron in different preparations will give red, brown, yellow, and green; manganese gives violet, grey, and black; chromium gives yellow and green; chromium and tin gives pink; cobalt gives blue, grey, and black; copper gives green, red, and with sodium turquoise; gold and tin gives the purple of Cassius (so called from its discovery at Leyden by Andrew Cassius about 1683); uranium gives yellow to orange; titanium, lead, and antimony give different yellows; iridium gives black. Zinc oxide added will brighten most of these colours; tin oxide will render them opaque.

Gold is used as an overglaze pigment, the precipitated metal being mixed with bismuth and turpentine, and applied with a brush. After firing in the enamel kiln, it requires to be burnished, remaining otherwise in only a dull yellow condition. Silver effects are got by using platinum chloride. Imitation golds, liquid gold, etc., are used on common wares; they do not require burnishing. Needless to say, they are not so permanent, and do not look so well as the real metal. But—they are much cheaper.

It will be seen that many of the pottery colours are chemist's colours, and have only been rendered available by modern chemical research. Their preparation lies

mostly in the hands of colour-makers for the trade, and it is not uncommon to hear this regretted by practical potters. The very purity and perfection of the colours used often leads to a dead and mechanical level of attainment; a great part of the charm of old pottery comes from the imperfection of the materials that were then at command. The broken, throbbing colours, the accidental blurs and stains, the free and unhesitating, if careless, technique, have often resulted in a more artistic effect than will ever be given by the most perfect of materials used timidly and without taste.

CHAPTER II.

ANCIENT POTTERY.

WHO was the first potter? Back in the dawn of the world's history, where mythical figures loom large, was there some great primeval inventor whom we can hail as the father of potters?

We are afraid that this very practical and human of handicrafts had its origin in no very heroic fashion. As the early tribes spread over the face of the earth from their starting point in the heart of Asia (or as the very latest theory tells us, from Central America), the clay along the river valleys must soon have suggested many uses by its capacity of receiving and retaining the chance impression of footsteps. And although the daubing of mud over the plaited walls of a hut does not seem to bear much relation to the finished pottery-art of to-day, it is very possible that such a primitive use of a plastic material that was found to harden in the

fierce rays of the sun, may have been the first step in the long history of the ceramic art.

Whatever the source of early pottery may be, the forms and decorations of such examples as remain are all strikingly similar. The inventive capabilities of man as regards pattern-designing do not seem to vary very greatly whether he lived in ancient Mesopotamia, ancient Britain, or ancient America, or sojourned in a lake-dwelling in old Switzerland; or whether, under similar conditions of civilisation, he still lives remote from the march of knowledge in the Fiji Islands or heart of tropical Africa. The patterns are all more or less geometrical in plan, with incised lines, waved and zigzagged marks and impressions. The pottery found on the sites of the strange lake-dwellings in Switzerland, to refer to only one class, ranges over two or three periods; the oldest dates from the "stone age"—a prehistoric era when the use of metals and the knowledge of how to melt them was unknown. The vessels of this remote time—evidently intended for cooking or storing purposes—were baked by fire, but their irregular shapes show that they were built up by hand, and not thrown upon a wheel. Even in the "bronze age" (which began approximately in Europe 1500 to 1000 B.C.) the pottery of the lake-dwellings, though finer in form and with rudimentary decorations in red or black, is still hand-formed. With the "iron" period, Roman pottery is found, and "thrown" work of all kinds.

The ancient British pottery found in the burial mounds called "barrows" is entirely of this early barbaric nature, hand-formed and decorated by the simplest of methods. Most of the pieces are of the nature of sepulchral or cinerary urns, wide-mouthed vases, suggesting a flower-pot in shape; a similar shape but smaller, averaging four to five inches high, seems to have been used to contain food, and a slightly taller shape for liquids. The ornamentation has been given by indentations from a twisted cord, by incised lines, by small perforations, or by pressure from finger tips and nails. By examination of the sites where these relics have been found, it would appear that the clay vases, probably made by the women of the tribe, were burnt in the same pyre that consumed the bodies of the dead chieftains, and that the ashes were then gathered together and placed in the urns over which the stones and earth were subsequently piled, forming the "barrow." It is conjectured that the smaller vessels, found either in or alongside the larger ones, contained food and drink for the supposed use of the dead man. In the Prehistoric Room at the British Museum, there are numerous examples of these British sepulchral antiquities, as well as of the pottery of the lake-dwellers, together with similar primitive work from Germany, France, Spain, Holland, and elsewhere.

Even for such rude pottery as that just mentioned, the baking by fire had been used. For pottery of the

age that must have preceded this, in which the heat of the sun was the only hardening agent, we can best look to the dry regions of Egypt and Syria for examples, and there only in the form of bricks which had remained buried for ages under the huge desert mounds until the enterprising explorer came in these latter days, and drove his trenches deeply through the accumulations of rubbish. Recent excavations in Egypt and the valley of the Euphrates have produced results which elucidate many dark chapters in the history of antiquity, but among the important secrets that still remain hidden, is that of the relative priority of Egyptian or Babylonian art. In both countries, sun-dried bricks were used in enormous quantities, but reference to them does not decide any question of antiquity. Among the examples of these bricks in the British Museum are some bearing the names of Thothmes I. (1633 B.C.); Amenophis III. (1500 B.C.); and Ramesis II. (1333 B.C.), the latter monarch being identified as the Pharaoh who oppressed the Children of Israel. But objects of baked clay bear the names of Egyptian kings going back to more remote periods, and there are some small green-glazed tiles for wall decorations that date back to about 3300 B.C.

The walls of the palaces of Babylonia were constructed in many cases of sun-dried bricks. Not so well made as those of Egypt, or of such good clay, they carry back our knowledge to an equally distant period. At Telloh, one of the shapeless mounds

between the Euphrates and Tigris, the explorations by M. de Sarzec have made it evident that a great palace once existed there. On a platform, nearly forty feet high, of unbaked bricks, there are walls averaging eight feet thick of large square bricks, each stamped with the inscription of *Gudea*, an early king of Chaldea of about 2700 B.C.; and, with the inscription, a consecration to the god of the city, Nin-Giron, the Fire-God. These bricks are found to have been set in bitumen. Among the ruins were found the bases of two huge columns five feet six inches across and quatrefoil in plan, and built up of alternate courses of curved and segmental bricks. To find such a feature, so strongly suggestive of the Egyptian papyrus columns, in Chaldea, a country where the absence of stone would have made it difficult to build columns, except of wood, points to a close connection with Egypt at the time of the erection of this palace; a connection made still more evident from the fact that several statues of Gudea, found in the dêbris, are carved in green diorite from the Egyptian quarries at Mount Sinai. The figures are represented seated, in quite a characteristic Egyptian pose, and on the lap of one of them is a tablet engraved with the plan of a building and the indication along its edge of a scale, which Prof. Petrie has identified as an Egyptian cubit (20·63 inches), and not the Babylonian cubit (of 21·6 inches).

Buried deeply beneath this ancient palace of Gudea,

still older fragments were found—bricks and inscribed stones. From the style of the writing, which is different from the usual cuneiform shape, it is judged that the date of these must be put further back than the time of Sargon I. (3800 B.C.) Still more ancient than even these are a few objects in stone to be seen in the British Museum—gate-sockets and boundary marks—inscribed with the names of kings going back to the time of Eannadu, about 4500 B.C.

The deeper one delves into the records of these early civilisations, the more remote seem their origin. And yet it is of great interest, especially in connection with our subject of pottery, to endeavour to ascertain whence came the degree of artistic power that is already evident in the oldest Egyptian remains extant. In the tombs at Medum, dating from the time of Senefru, the founder of the fourth dynasty, about 3750 B.C., are walls painted with scene after scene depicting incidents of the life of that time, and it is clear from these representations that painting, sculpture, weaving, and *pottery-making* were all in an advanced condition. Senefru is known as the conqueror of the peninsula of Sinai, valuable for its mines of copper and turquoise. His son Khufu (or Cheops) was the builder of the Great Pyramid at Gizeh.

No specimens of this early pottery seem to be extant. It was probably earthenware, and used mostly for domestic purposes. Vases of alabaster, marbles,

and stones would naturally be more likely to survive; and numerous examples of such vessels have been found. An alabaster fragment in the British Museum bears the name of Kha-f-Râ, the builder of the second Pyramid (about 3660 B.C.). Others, more perfect, are inscribed with the names of various monarchs of the fifth and sixth dynasties (3560–3100 B.C.).

It is not till we reach the more recent eras of 1700 to 1500 B.C.—somewhere about the time that Joseph was sold into Egypt—that we are on more certain ground, and may actually handle existing specimens of the Egyptian pottery. These are pieces of glazed ware of a dull, deep red colour; there are vases, long, narrow vases (amphoræ), pedestals, and bowls—the latter wide-mouthed shapes, being all more or less warped. Other specimens are jars painted and glazed to imitate variegated glass and marble; other painted vases have conventional patterns in dull colours under a very slight glaze. One very strange group of grotesque decorations in which rudely modelled faces and suggestions of figures are found, does not bear much apparent relation to the usual Egyptian types of ornament, but rather recalls the grotesques of Mexico or Peru. However, in all ages, this idea of a rude human head formed out of a pot seems to have occurred to the workers in clay, even up to the times of the Grès de Flandres, and it is not surprising if the patterns are rather similar.

The beneficent Nile still provides, as it did of old, the raw material for the potter's use. The silt brought down from the hills of the far interior seems to have been especially well adapted for all kinds of ceramic manufactures. The domestic wares of all sizes, from an inch to several feet high, are in the red terra-cotta, and made on the wheel. Well baked, the colour runs to purple; not so well-fired, more towards yellow. Many sepulchral jars are found of coarse red clay; those for the mummies of the sacred ibis are of sugar-loaf form, and provided with a lid cemented to the body. Some jars of very large size were used for preserving foods; a set of them, with their pointed ends thrust into the sandy floor, no doubt formed the usual Egyptian pantry.

The well-known wall painting at Beni Hasân representing potters at work, shows also the kilns in which the work was fired. It is not very clear how the kiln was constructed; it seems to have been a kind of shaft, perhaps six or seven feet high, on the top of which the vases were placed. One workman squats down to stoke the fire, shielding his face the while with one hand. Another is apparently engaged in handing down the fired pieces, standing on a platform the better to reach the ledge. The finished wares are being carried away in baskets slung from a yoke across a man's shoulder.

At a later period, when Egypt was no longer its own

master, the terra-cotta wares are strongly influenced by Greek and Roman ideas. The earthenware jars and vessels found at Naucratis, Bubastis, and other cities in the Delta, are no longer typical of Egypt, and form the transition to the pottery of Phœnicia and ancient Greece.

The most characteristic Egyptian pottery is that

Potters' earthenware vases.

a e i p the wheels on which the clay was put. Fig. 1 forms the inside and lip of the cup as it turns on the wheel *a*. *b c d* are cups already made.
Fig. 2 forms the outside of the cup, indenting it with the hand at the base, preparatory to its being taken off.
Fig. 3 has just taken off the cup from the clay *f*. Fig. 4 puts on a fresh piece of clay. Fig. 5 forms a round slab of clay with his two hands.
Fig. 6 stirs and prepares the oven *g*. At *s* is the fire which rises through the long narrow tube or chimney of the oven, upon the top of which the cups are placed to bake, as in *e*. Fig. 7 hands the cup to the baker 8. Fig. 9 carries away the baked cups from the oven.

EGYPTIAN POTTERS AT WORK.
(*From a Wall-painting at Beni Hasan.*)

which is comprised under the name of Egyptian porcelain. It is not really a porcelain; the materials for making true porcelain were to be found in Egypt, but no combination of them approaching the Chinese ware was ever accomplished. The body is composed almost entirely of sand, having little or no cohesion in itself, and infusible at the low heat that was used. There could have been no plasticity; and it seems to have

been only suitable for stamping from moulds. It, however, was capable of receiving a strong glaze, composed of finely ground silica and soda, coloured with various metallic oxides. The turquoise blue obtained from copper is a most beautiful colour, hardly to be rivalled at the present day; the green and red (also from copper), the purple, yellow and white (from manganese, silver, and tin), combine to form most delightful harmonies. The reputation of this ware was carried far and wide, and it was largely exported to other countries.

The green-glazed tiles already mentioned as dating back to 3300 B.C., are in this ware. Those to be seen in the British Museum are not large—only about two inches long by one broad, and not an eighth-of-an-inch thick. They have a perforated ridge at the back, or are bevelled on the edge for fixing into the plaster of the doorway of the pyramid at Sakkárah, where they are found. A larger use of such tiles was made in the palaces, built by Rameses II. and Rameses III., at Tell-el-Yahûddîyyeh (the ancient Vicus Judæorum). The walls were covered with tiles; some representing the conquests of the kings have spirited figures in low relief of different prisoners of Asiatic and Negro appearance. Their garments, the backgrounds and the incised hieroglyphs are filled in with coloured enamels. Some of the decorative designs of fruits and flowers are delightful in colour. One very inter-

esting object in the British Museum is a tile of blue porcelain six inches by four, on which is drawn in outline of a darker blue colour the figure of a scribe named Amen-em-apt adoring Osiris. Of similar character to these are the glazed fragments for inlaying the decorations of mummy cases, or building up composite figures; beards and wigs in deep blue, fingers, toes, eyebrows, eyelids, eyeballs, are among the forms most frequently found. Little statuettes of divinities and sacred animals occur in great numbers, as do also sepulchral figures inscribed or painted with hieroglyphs. Some of these figures, evidently used by poorer people, are either without any inscriptions at all, or have only names carelessly written. Blue seems to have been the usual colour; it is found in all shades from dull greenish blue up to a vivid deep colour; a few of these figures are glazed in a pale bluish-white, with painted purple hieroglyphs. Connected also with the elaborate funeral ceremonies of the Egyptians were the charms or amulets attached to the mummy-wrappings at various fixed places; they consist of representations of the sacred beetle or *scarab*, the *utchat* or symbolic eyes of the sun, the boat of the dead, the *uraei* or serpents, etc. Some of the perforated breastplates of porcelain, in which these and other symbols are combined, positively glow with fine colour, and are well worth careful study.

To the custom in vogue among the Egyptians of

placing in the tombs of their dead ones, vessels containing foods, wines, or unguents, and in many cases some favourite instrument or object once prized by the deceased, we owe the knowledge of so many interesting details of their habits. Pathetically significant are the little toys sometimes found, such as a wooden doll with a mop of hair formed of clay beads, or a child's ball of blue porcelain, a set of draughtsmen, or a set of little pipe-like tubes containing black powder of stibium, used for colouring the eyes of some fair Egyptian. A few nicely-shaped goblets and bowls have survived to our own day; they are decorated with the lotus-flower, or coloured inside and out with the prevailing turquoise blue.

OVIFORM BOTTLE.

The Egyptians successfully applied this method of glazing to objects not of pottery at all. Steatite, or soap-stone, was carved into many of the forms we have already mentioned, and then glazed and fired in the same way as the pottery. One vase of steatite, glazed in olive-green, is inscribed with the name of Thothmes I. (1633 B.C.).

Interesting, as affording evidence of another period of connection between Egypt and Assyria, are the

clay tablets found at Tell-el-Amarna, which record in *cuneiform* characters the correspondence between various subordinate kings, and Amenophis III. (1500 B.C.), the great king who erected at Thebes the two colossal statues of himself, which were known to the Greeks as the statues of Memnon. These little tablets are of the form quite common in Assyria, but otherwise not found in Egypt. One of them is actually a letter from Amenophis himself to a chieftain of the name of Kellimma Sin, and relates to the hand of a Princess Sukharti whom the king wished to wed.

Turning now to the pottery of Chaldea, Babylonia, and Assyria, we shall not find any very large proportion of it of any definite artistic character. As already stated, the fertile plains of Babylonia were great brick-making centres, the platforms and walls of the palaces being generally constructed of the unbaked bricks, but faced with better materials, stone or marble, on internal walls, and glazed or enamelled bricks on external walls. Sir Henry Rawlinson found on excavating the mound of Birs Nimroud, the traditional site of the Tower of Babel, that remains still existed there of the Tower of the Seven Planets, built about 600 B.C. by Nebuchadnezzar II. Each storey of the Tower was faced with bricks glazed in different colours, symbolical of the planets. One stage was built of greenish-grey vitrified bricks; the next of blue vitrified clay, conjectured to have been burnt *in situ;* another stage of yellow

bricks gilded; the next of pink; the next of red, and another of black. The platform for the whole was of unbaked bricks. The oldest named bricks still in existence are those of the time of Dungi and Gudea, kings of Babylonia about 2500 B.C. The inscriptions were stamped on, or impressed by an engraved cylindrical seal, and there are examples of these seals, engraved in different hard and precious stones, which date back to Sargon I., who reigned about 3800 B.C.

ENAMELLED BABYLONIAN BRICKS.

Both Babylonians and Assyrians made great use of clay for documentary purposes. What the papyrus was to the Egyptians, the fine close red clay was to the others. Little tablets of rounded forms (like a modern flat cigar-case) have been found in enormous numbers, stamped with microscopically small cuneiform characters in close and orderly lines. They record all kinds of information; some are chronicles of kings, early legends, astronomical observations, descriptions of buildings, and so on; a large number are contracts

of sales, of slaves, and other property, records of loans, and leases of land. Some of the tablets of this latter kind have the impressed signatures of quite a crowd of witnesses; as many as sixteen are found, in addition to the name of the scribe and place, day of the month and year of the king's reign, and all frequently in a space not much exceeding a square inch or two. A great number have the information and signatures repeated on a close-fitting case of similar form. After baking, these official statements seem to have been preserved together in the royal archives, to be brought to light only after the lapse of thousands of years.

A few examples of clay modelling have been found among the Babylonian ruins, mostly of small size. There seems every probability that larger works, such as statues of gods, were made in terra-cotta; apparently of such a nature was the figure seen in Nebuchadnezzar's dream. The examples known are in a light red clay. One in the British Museum was presented by Prince Albert, and represents in bas-relief a man holding by the collar a huge dog of the Thibet breed.

The few vases of Babylonian work that have been found were thrown on the wheel, and are mostly of terra-cotta. A small number are glazed in the same manner as the bricks already mentioned; the colours are blue, yellow, and white, the latter from the use of

tin ; the glaze is similar to the Egyptian—a silicate of soda—but not so good.

ASSYRIAN POTTERY was very similar to Babylonian. As the old Babylonian empire weakened, the Assyrian grew strong. More northerly, it was nearer the Armenian quarries, and hence, although the walls of the Assyrian buildings were still of brick, the facings to them were now of carved stone. A large number of these wall-slabs are to be seen at the British Museum, and indicate that the Assyrian sculptors were artists of no mean order. The subjects of the carvings relate mostly to the conquests or prowess of the kings, and but few indications are given of domestic incidents. Underneath one of the hunting scenes thus represented at Nineveh, there were found some little terra-cotta models of dogs with their names stamped on their bodies. It is very possible that these were memorials of some of the king's favourite hounds. The custom of using baked clay tablets was continued, and some most remarkable historical information has been obtained from these and from the large cylinders and prisms on which the achievements of the kings were stamped. Some eight-sided prisms (the largest two feet long, and covered on all its faces with close writing) record the campaigns and building operations of Tiglath-Pileser I., who reigned about 1100 B.C. Similar cylinders relate to other enterprising monarchs ; one of the most interesting is that which tells of

Sennacherib's first successful expedition against Hezekiah, King of Jerusalem (701 B.C.). "Hezekiah himself, like unto a bird in a cage, did I shut up within his house in Jerusalem." But the mysterious disaster that came upon Sennacherib's host in the campaign two years later, is not recorded upon any cylinder.

Under *Esarhaddon* (681 to 668 B.C.), the whole known world was conquered, and the Assyrian king reigned in Egypt, Phœnicia, Cilicia, and Media. His son, *Assur-bani-pal*, who reigned for forty-two years, was a generous patron of art and literature. His vast kingdom was, however, maintained only by prolonged wars and dreadful cruelties, and within a few years of his death, the empire fell to pieces. On its ruins was founded the new Babylonian empire, but this was of short duration, and with the fall of Babylon in 539 B.C. to Cyrus the Persian, Babylonia lost its independence. The British Museum possesses a cylinder of Cyrus, giving an account of the capture of Babylon.

In the ruins at Nineveh of the palaces of Sennacherib and Assur-bani-pal, there was found a vast collection (about 20,000) of clay tablets, which evidently formed a library. A sinister guardian of the buried store was discovered during the excavations which brought these to light, in the shape of the skull of a man, most probably the warder slain at the taking and burning of Nineveh in 609 B.C. The collection of these tablets seems to have been begun by Esarhaddon, and con-

tinued by Assur-bani-pal, whose name is stamped on most. Some are evidently copied from older originals, and bear the words "like the ancient tablets of Sumir and Akkad." Many of them are of educational character, and those with parallel translations of the ancient language of the country, Akkadian, into Assyrian have been of great assistance to modern students. Lists of plants, animals, countries and their products, metals and their uses, figure in this extraordinary collection; but the most interesting are those relating to poetry and mythology. Among the latter are the series containing the Chaldean story of the creation of the world, and another giving a version of the Deluge, very closely resembling the account in the Bible.

Among the small tablets recording commercial transactions are some rather quaint items of information; one is a summons for non-payment of the price of a slave; another is a contract referring to a loan of twelve manehs of silver for six months at one shekel of silver interest; another—the smallest tablet known—is one worn by a female slave and stamped with the name of her owner.

The violent destruction that seems to have overtaken the vast Assyrian palaces may account for the comparative rarity of decorative details in pottery. Portions of slabs and corbels, however, have been found, from which it is possible to get some idea of the technical attainments of the artists. Some have conventional

ornament in white, black, and yellow under a dull glaze. Brown, blue, and green are also used. The melted enamel in some cases has run down the sides of the bricks or slabs, which were evidently fired on their backs, having first been biscuited. There are continuous patterns over some of the bricks, the ornament outlined in white and filled in with pale blue, green, and yellow. Some of the tiles were evidently fastened to the ceilings, having central bosses and holes for lamp-cords. The guilloche, rosettes, sacred trees and winged animals so characteristic in Assyrian art were destined to have, as we shall see, great influence on the ceramic art of Phœnicia and Greece.

On the fall of Babylon, Cyrus, the Persian, became monarch of all Asia from the Mediterranean to India. Although a Polytheist, he was hailed by the captive Hebrews as their deliverer and the "Anointed of Jehovah," and with his goodwill they were allowed to return to their own country. His chief court was at Ecbatana, the capital of Media; but for certain periods of the year it was held at Susa or Shushan, in Elam. Later monarchs of his line, Darius, Hystaspes, Xerxes, and Artaxerxes, were great builders, and very wonderful remains of their vast palaces are still to be seen at Persepolis (the capital under Darius and Xerxes), and at Susa. At Persepolis there was abundance of stone, and the architectural features such as columns, brackets, doorways, etc., which, being in wood, have disappeared

at Nineveh, are found at Persepolis in great number and in fine preservation. The remains at Susa, however, are much more interesting from the potter's point of view, for here there have recently been unearthed by M. Dieulafoy large portions of the decorations of what must have been the most remarkable edifice of clay ever seen. Situated as the place was, at a distance from suitable quarries, it seems to have been determined to utilise the resources of the potter's art to the utmost. The great king Darius attracted artists from far and near; the workers in enamels spread their most gorgeous colours upon the modelled surfaces of the brick walls which lined the wide staircases or towered above the hill-side. From the specimens now to be seen in the Louvre it is evident that the potters of that day possessed no mean skill. The designs are of quite the Assyrian type; one very important fragment, thirty feet long and fifteen feet high, represents a procession of giant archers, with black visages, and accoutrements and garments in white, golden yellow, blue, black, gold and silver. The modelling of these enormous figures has been done upon the narrow edges of large tile-like bricks, the joints of which occur at regular intervals without reference to the modelling. It is possible that the figures were moulded in large sections, laid down upon the requisite number of bricks, and the jointing of the latter continued up through the modelling. The body of the bricks is composed of a hard white clay;

the enamels covering the surface are of great brilliance. The name of "Darius King" in Persian, Median and Assyrian appears on the enamel.

From the palace of Artaxerxes which occupied another portion of the site, M. Dieulafoy brought home another most valuable example of this ancient decorative art, in the form of a frieze of lions moulded and enamelled in a similar way to that of the archers. The animals are represented steadily advancing, each with gaping jaw and tail extended. The body is white, the mane is green, touches of blue and yellow about the mouth, and the background of the whole a turquoise-blue. Above and below are borders of ornament in blue, green, white, and yellow. The effect of this brightly-coloured row of beasts, each six feet high and eleven feet long, must have been startling. The sides of a wide staircase were also found to be decorated with a bold conventional pattern of lotus and palmettes in colours.

We have devoted some space to the description of these valuable monuments of the ancient Persian art, on account of the important position they occupy in the history of ceramic knowledge. It is very singular that the Persian potters were the only ones to retain the secrets of these ancient enamels. The art of using them died out in Egypt; it was never adopted by the Phœnicians or Greeks; and when, in after centuries, enamelled faïence was brought westward to Europe by

the Arabs, they were still Persian workmen who produced it. The Persian empire underwent many vicissitudes, and saw many changes in its kings. When the whole world was overrun by Alexander the Great, Babylon was for a short time his capital. He is said to have had 10,000 men at work at the restoration of the famous temple of Baal, but without making any definite impression on the huge mound of brick. On the partition of Alexander's empire, Persia and Syria fell to the share of Seleucus Nicator, but the dynasty (the Seleucidæ) founded by him was not of long duration, and eventually the Parthians (under the Arsacidæ) governed the countries around the Persian Gulf for 450 years. Of the Parthian period considerable ceramic remains abound. The most extraordinary, perhaps, are the glazed terra-cotta coffins, of which many thousands have been found at Warka (Erech of old). Examples may be seen at the British Museum. They present somewhat the appearance of a mummy-case; a long box in one piece, with a large orifice at the wider end covered by a separate oval lid. The lid and top are covered with stamped raised patterns, and the whole is glazed thinly in green. To the same period belong some vases, bowls, hand-lamps, etc., glazed with a pale pearly glaze, and numerous red or yellow terra-cotta urns, in which the burnt ashes of their dead were deposited.

Of the pottery of the Hebrews few examples remain.

There are several references in the Bible to the subject, and the use of the throwing-wheel was evidently quite familiar. There was a guild of potters at Jerusalem, and one of the gates of the city was named after them. For all but domestic wares, it is probable that the Jews turned to the Egyptians or Phœnicians for their decorated pottery. In the later times of the Roman dominion, the characteristic red Roman ware must have been used very largely, for there are numerous fragments found in the dêbris outside the city walls.

The Phœnicians, or ancient inhabitants of Canaan, driven to the sea-coast by the incoming Israelites under Joshua, became the great traders of antiquity, and their ships traversed all the known seas in search of, or bearing, all kinds of commodities. Our own shores were visited by them at a very early period for tin. Most enterprising colonies were successively planted among the islands and along the shores of the Mediterranean Sea, and it is among the ruins of these colonies that examples of their best ceramic productions may be found, although of their most powerful offshoot, Carthage, this cannot be said. To the practical business-like nature of the Phœnicians is due the simplification of the Egyptian hieroglyphic writing, into the more compact alphabet which has formed the basis of all later European alphabets. To them is also due the discovery of glass, and of the famous dye, the Tyrian purple. It was with Hiram, king of Tyre, that

Solomon was in friendly commerce. It was also from Phœnicia that the degrading Baal-worship was introduced into Israel on the marriage of Ahab to the Sidonian princess, Jezebel, a worship that gradually undermined the theocracy of the Jews, and led to their final loss of independence.

The influences that moulded Phœnician art are seen very clearly in the pottery that has been excavated in Cyprus, one of the earliest of the colonies. At first, the ornamental details were evidently suggested by Egypt and Assyria; and then, on the gradual rise of Greece to power, the Greek feeling is very apparent. In fact, along the shores of Cyprus that lay nearest to Greece, there were actual settlements of Greeks. In course of time, the races amalgamated, adopting the Greek language and the Phœnician religion. At *Idalium*, under the remains of a Greek town, there were found numerous traces of an earlier Phœnician settlement; the pottery was in a light coloured clay, with geometric patterns and concentric circles roughly painted in brown. A characteristic note of the early patterns is the generally vertical direction of the lines. About the seventh century, a method of decoration, evidently suggested by Assyrian art, gradually spread westwards; it is principally seen in the arrangement of the animals or figures composing the design, into continuous friezes round the vase. Another suggestion came from Assyria in the form of raised patterns,

either singly stamped on, or produced by an engraved cylinder being rolled across the surface. At *Curium* there was found a large vase, four feet nine inches high, and now in the New York Museum, covered with decoration which has this Assyrian feeling. Strong bands of colour alternate with rows of spirals, draught-board patterns, rudimentary Greek fret or key patterns, friezes, and panels of animals conventionally disposed.

It was by a series of very gradual changes that the Greek ceramic art arrived at its perfection. As in other countries, the oldest specimens are formed by the hand, and not upon the wheel. Some are grotesquely made to resemble an owl; a few incised patterns are found, but no colouring; the clay is fired to a dull black tint. Other objects found indicate that they belonged to the "stone age." Of this kind of pottery are the remains excavated by Dr. Schliemann at *Hissarlik*, the supposed site of Troy; they were found buried (with twenty-one inches accumulation of earth between) beneath the remains of a city which had evidently been burnt, and which the explorer identified as the veritable city of Troy, besieged for nine years by Agamemnon, king of Mycenæ. The relics of this second city were mainly treasures of gold; there were indications that the "bronze age" was commencing, and the date would, therefore, be about 1200 B.C.

Found at many places on the islands of the Ægean

Sea and on the mainland of Greece, is the next class of Greek pottery, generally known as *Mycenæ ware*, since Dr. Schliemann's excavations at Mycenæ attracted special attention to it. The general feeling of the designs seems to be derived from Egyptian and Asiatic sources; there is a new note, however, in the extensive use of marine forms, as well as vegetable and geometric suggestions. The cuttle-fish, sea-weed, and shell-fish are very common in the designs, but the human figure, when introduced at all, is drawn with much simplicity and archaism. It seems very probable that for some few centuries before 1000 B.C., there was a very similar and general condition of culture among all the nations bordering the eastern shores of the Mediterranean. Egyptian relics have been found at Mycenæ in Greece (among them some of the porcelain scarabs, with names of Egyptian kings back to 1500 B.C.), while in Egypt, many vases from Mycenæ have been found in tombs dated 1400 to 1100 B.C. The ware is generally yellow in colour, with paintings in yellow, brown, and black, in colours that acquired a lustrous gloss in the firing.

A later style of the Mycenæan ware was somewhat more geometrical in its decorations. From the fact that many examples of it were found near the Dipylon gate at Athens, the name of the *Dipylon style* has been given to the whole class. Various arrangements of lozenges and chequers, meander and key patterns,

vandykes and waved or sloped lines made up the resources of the designers.

About the seventh century B.C., the Greek colonies round the shores of the Mediterranean, especially at first in Cyprus and Rhodes, brought about a more intimate artistic connection with Assyria, and, as already mentioned in connection with Phœnician pottery, the Assyrian decorative ideas gradually spread to the west. The shapes of the vases altered, becoming generally shorter and rounder, and the decorations of animals and figures were arranged in friezes or bands round the shapes. In Greece itself, the potters of Corinth were the first to feel the new influence; the Athenian potters, more conservative, were a little later in combining the Oriental ideas with their Dipylon style. This class of Greek pottery is known as the *Phaleron style*, having first been found in sites along the road from Athens to Phaleron.

Principally found at Camiros, in the island of Rhodes, and made about 600 B.C., is a variety of ware in which the friezes of figures suggest very strongly the designs of Assyrian embroideries. The animals constituting the patterns stand closely together, showing but little of the ground, and there is a constant repetition of the *rosette* familiar in Assyrian ornament. The painting is done in black on the red clay, partly in solid black, partly in outline; inner markings are incised through the colour, or added in purple. Great

use, too, is made of a white or cream-coloured slip (or *engobe*) for indicating flesh-colour.

In the time of the twenty-sixth Egyptian Dynasty (660–530 B.C.), Egypt opened her ports to foreign ships, and her armies to foreign mercenaries; at the same time, Greek settlements were founded actually in Egypt itself, at Naucratis, Daphnæ, Bubastis, and other places in the Delta. Numerous ceramic remains have been found on these sites; the shapes of the jars and vessels are comparatively rude, the colour of the body being generally from buff to a dull red. The designs, although mainly Greek, show curious traces of a more cosmopolitan feeling. Occasionally an Egyptian inscription occurs more or less inaccurately rendered by the Greek painter. Some of the pieces are in a black ware with a high polish; to one of them (in the British Museum) a large vase (broken), some amount of personal interest is attached. It bears a dedication, inscribed by a Greek officer, named Phanes, of whom it is related that he deserted the Egyptian army in order to join the Persians, then advancing under Cambyses to invade Egypt. The two armies met; the former associates of Phanes, still faithful to their Egyptian command, took his children, whom he had left behind in Egypt, slew them in a large vase, and, full in view of their father, adding wine and water, drank of the contents.

With the sixth century B.C., a growing preference for

figures of men and deities is evident in Greek pottery. Retaining the white biscuit, or a glazed red or brown for the ground colour, the designs are painted in solid black, touched up with purple or white (for flesh), both of these being painted on above the black, and fired again at a lower heat. Some from Naucratis have a cream-coloured ground; and some new colours are used in the paintings that may have been suggested by Egyptian wall paintings, as, for instance, a light sienna and an amber red.

In the following century (fifth century B.C.), the period during which Phidias produced the wonderful sculptures of the Parthenon at Athens, a very different style of decoration was in vogue. The figures were outlined, and left the natural red colour, but all the background was filled in with the black lustrous colour. The inner lines of features, draperies, etc., are finely drawn on the red. The best examples of vase painting are found in this class; the figure drawing pure and refined; the composition simple and expressive. Colours are occasionally introduced; the flesh is sometimes painted white, and the draperies, in later examples, blue, green, and purple. Another sign of later work is the use of pink and gilding.

Contemporary with this finest period are the funeral vases or *lekythi* from Athens, of a very graceful shape, and with a white ground, on which the figures in outline have been drawn with a quick and certain hand.

The draperies are occasionally filled in with red, brown, green, or blue.

Greek ceramic art had its decadence. The perfection once reached, the only thing left to do apparently was to make the designs more florid, the figure drawing exaggerated, the shapes eccentric. The subjects of the compositions are no longer taken from the religious myths and histories of heroes, but from burlesques or every-day incidents of ordinary life. From this loss of the ideal to the absence of all representations of figures was no great step, and it was soon taken. A style of vase decorations, consisting of tendrils and conventional forms, painted in white or purple on the black ground, was followed by one utilising moulded reliefs, and glazed in black, red, or green. Greek art was already dead, when the destruction of Corinth by Mummius in 146 B.C. led to the death of Greece as a nation, and its absorption into the Roman empire.

Within its own limits, Greek ceramic art, in its best periods, has a grace and perfection that have never since been equalled. The material was of the commonest, and no effects of gorgeous colour were ever attempted; but the keen sense of beauty in form that led to the supremacy of the Greeks in architecture and sculpture was equally evident in the chaste proportions of the shapes, and the eloquent balance of the decorations, of their pottery. This reticent art occupies a position of "splendid isolation;" it rose from rude

archaism, and within a few hundred years had grown, flourished, decayed, and ended again, leading to no definite advance in the technique of the potter's art. A singular fate awaited most of its products; they were destined to remain unknown to the world until within the last 200 years or so; the openings of ancient tombs in Italy, principally in the region that in Latin times was Etruria, led to the discovery of hidden hoards of this painted pottery, which thus came to be at first styled Etruscan. Its Greek origin was, however, soon apparent, and later discoveries, some of quite recent date, have made the links in its story fairly complete. There are now, it has been computed, something like 50,000 Greek vases known belonging to private persons and public museums; at the British Museum several large rooms are filled with large and valuable specimens arranged chronologically in the groups we have mentioned.

It may be convenient to name a few of the most usual shapes found in Greek pottery. The largest was the *pithos*, a huge unglazed jar, generally too large to be thrown, and, therefore, built up in sections by hand. It was in one of these tubs that Diogenes, the cynic, took up his abode; but it would seem that this kind of dwelling was not altogether unknown among the poorer classes. A constantly recurring form was the *amphora* (literally, carried on both sides), a tall shape, sometimes with a pointed base, and with two handles. In large

sizes—three to six feet high—this was used for stores of all kinds: wine, water, oil, etc.

The *stamnos* had two handles and a wide mouth; the *askos* had an arched handle over the top joining a spout and an open neck; the *hydria* was a water-pitcher, with two small side handles, and one larger one; the *rhyton* was a drinking-cup (generally moulded), which could not be set down unless empty: it took the form of a head of some animal; the *lekythos* was an oil-jar of tall shape, with one handle, and a cup-like mouth set on a narrow neck; the *krater* was a large wide-mouthed vase for cooling and mixing wines; the *oinochoe* was for serving wine, and had a characteristic lip pinched in at the sides; the *kantharos* was a drinking-cup or goblet, with looped handles, and the *kylix* also, but of a flat dish-like shape, in early examples standing on a foot; the *aryballos*, a round or

GREEK AMPHORA WITH BLACK FIGURES.

bladder-like jug, held perfumes or oils, while the *kyathos* served as a ladle.

The generally soft state of these vases not unnaturally led to some amount of loss by breakage. Whether the natural tendency of pottery to get broken, and the abundance of fragments, led to the adoption of the political method of ostracising an obnoxious citizen, or the latter prompted an undue recklessness in the treatment of pottery, is uncertain ; but it is a fact that, at one period in Greek history, pot-sherds (*ostraca*) were used in large numbers for recording votes, as well as for current business transactions, giving receipts, and so on. (One might refer, in this connection, to the pot-sherd that figures so prominently in Mr. Rider Haggard's "She.") The inventiveness of youth is responsible for yet another use of broken Greek crockery, in a game called *ostrakinon*, in which the players tossed up a piece to see if the black or red side came uppermost.

Many vases with dedications to the gods have been found in the neighbourhoods of temples on the Acropolis at Athens, or at Delphi ; at Naucratis, in the Egyptian Delta, numerous fragments, with inscriptions to Apollo and Aphrodite, were found near the ruins of temples to those deities. Among the vases found in tombs, few are more interesting than the prize vases won at the Panathenaic games at Athens, presumably interred in the graves of the athletes them-

selves. There are some exceptionally handsome examples of these at the British Museum. On one side is a conventionalised figure of Athene, and on the reverse, different representations of boxing, foot-racing, leaping, disc-and-spear throwing, horse-and-chariot racing. Some bear the names of the archons or governors of Athens for the particular year in which the games took place, and it has been, therefore, possible to ascertain the dates of these pieces as ranging from 367 to 328 B.C.

The clay used by the Greeks contained a large proportion of carbonate of lime; it is never very hard, and is easily scratched. It is porous. One of the most celebrated clay-pits was at Mount Colias; but the natural colour not firing sufficiently warm in tint, there seems to have been a practice of staining it darker with red ochre. The graceful outlines and lightness of make of the vases show a high degree of skill in throwing; the invention of the potter's wheel was in fact claimed by the Greeks, who attributed it to, among others, Corœbus at Athens, Hyperbius at Corinth, or the mythical Daedalus. Moulds were used for forming the handles, mouths, and other projecting portions, and these were affixed with remarkable cleanness and exactitude. Occasionally, in later times, the whole shape was moulded, as in some of the *rhyta* or drinking-cups, or the peculiar jugs in the form of human heads, or double masks. A beautifully finished vase in the

British Museum, with very refined decorations, is in the strange form of a large knuckle-bone. The first application of colour (generally the black ground—either complete, or painted to the outlines only) was on the absorbent dry surface before any firing had been given. After this had been fired, the details were scratched in, and the remaining colouring given, to be fixed by a second fire.

The nature of the glaze on Greek pottery has called forth many diverse opinions. It seems to have been formed from soda; it is exceedingly thin, and is practically little more than a varnish. It combined best with the black colour, but very imperfectly with the unpainted surface.

A painted *kylix* found at Vulci has a representation of potters at work, and is thought to refer to the visit of Homer to the potters in the island of Samos. The wheel, a large wheel-like disc with spokes, is being turned by a boy; the thrower stands leaning over the wheel and is forming a tall amphora, one arm being inside the shape. Near him a youth is seated, holding a vase on his knees and affixing a handle to it; another carries away a vase towards the kiln. A man, undraped, bears on his back a heavy burden, possibly the fuel of charcoal or anthracite, and another stoops before the kiln, which has a cylindrical chimney ornamented with the head of Pan.

The two potters' quarters in Athens were called the

Kerameikoi, and their term for pottery was *keramos* (possibly from *keras*, a horn). Keramos, the son of Bacchus and Ariadne, was considered the patron of the art.

Most varied inscriptions are to be read upon the decorated vases, relating to all kinds of matters. The prize vases already mentioned are lettered, "I am a prize from Athens;" a cup will read, "Hail, and drink well;" on a vase with a scene of olive-gathering, the master says, "O father Jove, may I be rich!" and is answered with a picture of an abundant harvest, and the words, "See, it is already more than enough!" On other pieces are such inscriptions as, "The boy is handsome;" "What a boy!" "Hippokritos is the most handsome;" "Oinanthe is lovely." More particularly interesting, however, are the names of the craftsmen themselves, which are found on large numbers of pieces of the best period. One has, "Exekias it was who made and painted me;" a very usual formula is the name of the potter followed by "made" or "made me." Scratched in the feet of some, and evidently never intended to be seen, are private marks which have been deciphered as memoranda made by the workman as to the number of pieces in the batch or the prices he was to have for making them.

Some names of the artists of the best pieces should be mentioned; examples of their works are fairly numerous, and those to whom the splendid collections

at the British Museum are available may study some very beautiful specimens there. *Euphronios* seems to have been the most celebrated, and his *kylikes* (dishes) are of the very finest style. *Hieron* is chiefly known from his kylikes, on which his inscriptions are generally scratched (sometimes incorrectly spelt) under the handle or foot. *Meidias* executed some remarkable works in the florid style. *Amasis* was the painter of vases of an early type, as were also *Ergotimos*, *Eucheros*, his son, and *Nikosthenes*.* Of these, Amasis, Euphronios and Exekias were painters as well as makers. The others named seem to have employed different artists to work for them, among the names known being *Epiktetos*, *Euthymides* (on one of whose vases is written, "Euphronios never did so well"), *Klitias*, *Onesimos*, *Philtias*, and *Polygnotos*.

Apart from vases, the Greeks used pottery very largely for architectural purposes and for modelling figures. Sun-dried bricks seem to have been employed in building walls and fortifications, resisting the battering-ram better than baked bricks; they have, however, all disappeared, not having been protected by a facing of harder material as in Assyria.

Prometheus was regarded as the first worker in clay, being supposed to have formed Pandora out of earth and water. (Compare with this the Egyptian god *Num*, who moulded man from the dark clay of the Nile, and

* The Amphora represented on p. 90 is by this artist.

breathed life into him, and the Hebrew conception of the creation of Adam.)

Burnt bricks, roof-tiles, drain-tiles, flue-tiles, pavements, cistern-linings, columns, and other architectural features of terra-cotta were very extensively used, although the abundance of stone and marble available for the more important edifices rendered it unnecessary to use the baser material for works of the highest class. Roof-tiles were said to have been first made by Cinyras in Cyprus. The front edge was frequently painted with the Greek honeysuckle or other patterns. A potter named Dibutades was the first who placed heads or masks on the cornice tiles to mark the places where the rain-water ran through. Projecting spouts or gurgoyles were made in the form of a lion, or the mask of a Satyr with open mouth. Until 574 B.C., when Byzes of Naxos introduced a method of roofing with slabs of marble, the roofs of all the temples were formed of terra-cotta tiles. The old Erechtheum at Athens had its mouldings of painted terra-cotta. Even when marble came to be more used for the constructional parts of buildings, the pediments and other enriched fittings were frequently of terra-cotta.

A very extraordinary class of terra-cotta modelled vases seems to have been intended for decorative purposes in the temples. In a buff clay, a large and wide vase forms the foundation for numerous figures of all kinds and sizes, perched on the shoulders and

handles; projecting from the sides are the foreparts of

VASE OF APULIA. GREEK COLOURED TERRA-COTTA.

tritons or centaurs; on the body will be placed a large

mask and miscellaneous enrichments ; the whole piled-up effect being somewhat grotesque.

Of a more graceful manner are the small statuettes of which numbers have recently been found in the tombs of Tanagra, Myrina, and other places. They are comparatively late in date, and seem to have taken the place of the painted vases formerly placed in similar positions. They are principally little figures of draped women and girls, modelled in a simple graceful style and represented as engaged in scenes of every-day life. Most of them are coloured, but the tints seem to have been obtained from natural coloured earths not fired in, and they have therefore not withstood the touch of time very well. It is stated that there are many forgeries of these Tanagra statuettes in existence.

With a brief mention of the terra-cotta dolls (jointed like our modern Derby-day wooden doll) occasionally found in the tombs, and the hand-lamps, of which large numbers were used, our sketch of Greek pottery must close.

The ware was exported in great quantities to all parts of the then known world, notably to Italy ; some of the finest and largest pieces having been found there interred in the tombs. An extraordinary number of specimens has been found at Vulci in that part of Italy that formerly was known as Etruria. When first found, as has already been stated, Greek pottery received the

general name of Etruscan, but it is now clear that the native Etruscan art was of a more simple type. The Etruscans were known from an early age as successful workers in metal and in terra-cotta. Until the expulsion of the Tarquins in 510 B.C., Rome was practically an Etruscan city, and many Etruscan artists were employed in the decoration of its buildings. Among them it is recorded that Volcanius made the colossal statue of Jupiter in the Capitol for Tarquinius Priscus (about 600 B.C.). Most of the state ceremonial of Rome appears to have been copied from what was in vogue in the time of its Etruscan kings. It was not till 280 B.C. that the Roman Republic, having gradually grown in strength, finally conquered the whole of Etruria, and was able to use in its own numerous campaigns by land and sea the wealth and energy that formerly had rendered the Etruscans a great naval power allied with Carthage against the Greeks.

The origin of the Etruscans themselves is involved in mystery. In legend they were supposed to have migrated from Lydia in Asia Minor; but the evidence to be gleaned from their language, which is only now being deciphered from their monumental inscriptions, seems to point to the conclusion that they were quite an independent people, neither Aryan nor Semitic. In the full-length recumbent figures to be found on their terra-cotta sarcophagi they have preserved their own portraits for our later gaze. In the British Museum is

a remarkable example that was found at Cervetri; the chest or sarcophagus itself is modelled in low relief with numerous subjects, such as a battle scene, a banquet and a funeral, and on the lid half recline a male and a female figure, the size of life, and with most engaging expressions. Not all the sarcophagi are of these large proportions, however; the majority may rather be called chests.

The Etruscans were great tomb-builders, and the interiors of the sepulchral chambers were painted in fresco, with scenes from daily life or incidents connected with death. Surrounding the sarcophagus were placed articles of furniture, useful and ornamental objects, polished hand-mirrors, jewellery, and so on, as if ready for use in the spirit-world.

Of the Etruscan pottery, apart from the vases imported from Greece, or in later times, perhaps executed in Italy under the direction of Greek artists, a few varieties may be distinguished. Of a very ancient date are some coarsely made vases, in black or grey, of the primitive stone age; the rude decorations of incised lines and bosses resemble those of other countries. Of a peculiar type are funeral urns found under the volcanic tufa near Rome, and made in the form of a hut, with a little doorway through which the ashes were introduced, the orifice being closed by a lid tied on. Also of very early date are vases of reddish-brown clay speckled with mica,

and painted in clay (not fired on) with conventional patterns.

More characteristic of Etruscan art is the entirely black pottery fired at a low heat, and sometimes with a lustrous jet-like polish which is thought to have been produced on the lathe. The ornament of conventional patterns is incised or stamped in, or has reliefs either modelled on or produced by rolling an engraved cylinder over the surface as in Assyrian art. The shapes of the vases and jugs have some resemblance to Greek shapes, but are not as refined. Pliny mentions the black ware as having been made by the corporation of potters in the time of Numa, 700 B.C. Martial states that Porsena had a dinner set of the ware.

Of red ware there have been found large vases resembling the pithos of the Greeks; some have been roughly ornamented by the rolling of a cylinder. In a fine red paste are some sepulchral urns modelled in the shape of a man, the head forming the lid, and little smears of clay on the front signifying the arms and hands; they were found in the tombs, resting on terra-cotta chairs as if to convey the idea of the dead man still sitting there.

Imitations of Greek pottery by the Etruscans are fairly numerous, and subjects from Greek mythology abound, but the delicacies of design and finish in the Greek ware are entirely absent in the copies. Examples

of Egyptian enamelled porcelain are found in the Etruscan tombs, as well as Phœnician glass, and ostrich eggs with incised and painted designs of Egyptian character, but accompanied by Greek lettering.

Of great interest, architecturally, are some portions of a terra-cotta cornice and pediment of a temple that were found on the site of the ancient Lanuvium, and date back to the sixth century B.C. At Cervetri were found some antefixæ with a modelled head of the Gorgon, and painted with coloured clays. Examples of both of these are at the British Museum.

To turn to Rome itself. Although the only important development of pottery was that known as the Samian ware, yet the masterful, all-conquering Roman Empire could not fail to exercise a great influence in many other directions in the potter's art. The numerous and vast building operations carried on in Italy, and wherever the Roman soldiers penetrated, necessitated the use of bricks and tiles of all kinds. The Roman brick is recognisable anywhere. Made, in the first place, of well-selected clays and well-fired, the bricks used in many a Roman wall have outlasted their original purpose, and have been utilised by later builders for other edifices, frequently outlasting the stone used in even those. The central tower of St. Alban's Abbey, built, in Norman times, of Roman bricks taken from the dismantled walls of Verulam

close by, and still standing, while Gothic work of much later periods has crumbled away and been renewed, is an instance that will occur to every one. It is true

ROMAN BAS-RELIEF OF TERRA-COTTA.

that there is no particular artistic power displayed in brickwork, unless it be in contriving to get a useful thing made in the best way possible. The Romans as

a people were rather warriors than artists, rather directors than inventors, and, as a rule, such art as they used was provided for them by the nations they conquered. On the fall of Greece, its artists flocked to Italy, but the traditional refinements of Greek art were soon lost amid the opulence and display of Rome. In such a little matter as the sections of the mouldings used in architecture, it is very significant that the Greek curves form parts of ellipses, hyperbolas and other subtle outlines, but the Roman are very obvious downright parts of circles.

Of pottery, other than bricks, used in Roman architecture, there are numerous examples of terra-cotta, coloured and uncoloured, extant. As with the Greeks, columns, capitals and bases, mouldings and cornices in this material were largely introduced. Gutter-spouts formed as lion's heads, comic or tragic masks are frequently found, as well as friezes, panels, and wall-slabs modelled in bas-relief and affixed to the walls with leaden nails. Colours were often added, both for internal and external work; red, blue, black, white, green, and yellow are those most frequently seen; they were not fired on, but were sometimes used with wax (encaustic painting). Until their widening conquests placed the Romans in possession of quarries of stone and marble, their statuary was entirely of terra-cotta, nor did the material ever quite go out of fashion. Mention has been made of the Etruscan statue of

Jupiter in the Capitol, but for 150 years before that, no figures of any size had been seen, Numa Pompilius having prohibited the representation of the deity in human form. In 491 B.C. the temple of Ceres at Rome was ornamented with figures in terra-cotta, by Gorgasus and Demophilus, two natives of Sicily. A modeller, named Possis, is recorded to have made a statue of Venus at the expense of Julius Cæsar, and life-size figures have been found at Pompeii and other places. It was the practice to build up these figures in pieces, and Phædrus, in one of his fables, makes Prometheus return inebriated from a supper given by Bacchus, and proceed to apply the wrong limbs to the bodies of the human race which he was then engaged in forming from clay. Smaller statues modelled for casting in bronze or copying in marble were sometimes eagerly acquired by the Roman patrons, and those of Arkesilaos are said to have been valuable. Smaller figures still, called *sigilla*, are often found on Roman sites, and were probably used for toys and votive purposes. The last day of the *Saturnalia* was called the *Sigillaria*, because of the practice of giving presents of little images in honour of Saturn, and in allusion to the stones that he gulped down thinking they were his own children. Furnaces for baking and moulds for pressing the *sigilla* have been found at different places, some of the moulds having the names of the potters written on them. The figures were

moulded upon a stick, afterwards withdrawn, the mould being in two pieces to form the torso; the arms were separately made and stuck on.

Other interesting uses of terra-cotta were for cages in which to fatten dormice for the table, beehives, heated cones to place in front of the beehives to keep insects away, small altars for indoor shrines, money-boxes in which popular athletes received the donations of spectators, tickets for admission to the circus, and, lastly, lamps of all descriptions, and with very varied styles of ornament. One in the British Museum has a quaint representation of a circus race, the details of the course, the competing quadrigæ and charioteers, and the spectators being all crowded into the circle formed by the top of the lamp. Many lamps occur with Christian symbols, crosses, the XP monogram, the Good Shepherd, and one has a model of the seven-branched candlestick.

SPECIMEN OF SAMIAN WARE.

Roman vases compare unfavourably with the Greek; neither shapes, fabrication, nor decoration are as good. The characteristic Samian ware, of a bright red colour, is found throughout the empire, and must have been

an important article of export. With this exception, the Romans would appear to have used the clays they found locally, and there are consequently very diverse effects of colour. Some pieces, called *false Samian*, are of a coarse clay dipped in a coating of finer red; the Aretine ware, made at Arezzo, is of a red similar to Samian, but not so dark; red ware was also made at Saguntum, in Spain; some in a grey clay are fired so hard that they ring like stoneware. Pieces of a black ware have been found at Upchurch, in Kent; a yellow make, with a red lustrous glaze has been found at Caistor, in Northamptonshire, together with the black or brown pottery decorated with white slip, which is usually known as Caistor ware. Similar ware, with white decorations, has been found at Crockhill in the New Forest, together with brown ware with a purplish glaze; a white and a light-red ware was made in large quantities at Broseley in the Severn valley. A later class of ware has a yellow body, with a lead glaze coloured either green, red, yellow, or blue. Belonging to the last group is a vase that was found at Ewell; it has a yellow glaze through which there are apparent curved lines laid on in a white clay slip. The peculiar blackish hue of the Caistor and Upchurch ware was brought about by the smoke caused in smothering the fire at a certain stage in the firing. The pieces were loosely packed in grass in the kiln, and the air being shut out from the fire, the dense smoke caused the

iron stain in the clay to be darkened to black or blue by the imperfect oxidation, the effect thus being obtained on the same principle as the lustred-ware of later times. The remains of kilns found at Caistor were sufficiently complete to show the arrangements adopted to burn this Roman ware. The kiln was not of large capacity; a circular pit, four feet in diameter, and the same in depth, was walled round with brick, a small fire-hole leading into it on one side. In the centre of the pit was a support about two feet high, on which rested the inner ends of perforated triangular bricks, forming the floor of the kiln; the sides of the oven and the dome were built up of curved bricks after the ware had been placed in position, a small aperture being left at the crown. The fuel used was wood; in the furnace of one kiln that was discovered there was a layer of wood ashes four to five inches thick.

The decorations of the Caistor ware are interesting on account of their subjects and the amount of spirit that the artists infused into their work, notwithstanding the simple rough-and-ready slip method they used. The deer and hare hunts, the gladiators fighting, the chariot race, represented on many of them, throw some light on the tastes of our Romano-British predecessors.

As a general rule, Roman pottery may be said to have been produced for purposes of use, and not for ornament. Large *amphoræ* or *dolia* were made for keeping stores of wine, corn, and oil, and a set of

these, as with the Egyptians, formed the cellar of any large establishment. They were of the nature of huge casks, sunk in the earth, pitched or cemented on the insides, and bound with hoops on the outside; some were nearly eight feet high. Large bottles, called *lagena*, were used for transporting wine, figs, honey, etc. The ordinary amphora was of somewhat clumsy shape; its parallel sides, straighter than the Greek form, may have been adopted by the practical-minded Romans as economising space, and permitting a closer arrangement in the cellars. The insides were coated with pitch. In the early days of the Republic, pottery was used at table and for sacrificial purposes, but with increasing wealth, bronze, silver, and gold came more into favour. Various shapes are mentioned; the *patina*, a dish; *patellà* and *patera*, plates; *catinus* and *lanx*, large dishes; *trulla*, a bowl; *acetabulla*, vinegar-cup; *salina*, a salt-cup; *cadus* and *diota*, wine-vessels; *sinus* or *sinum*, large vessel for milk or water; *œnophorum*, a large wine pitcher; *urceus* and *urceolus*, smaller pitchers; *ampulla*, a jug. The *olla* and *urna*, were jars for sepulchral use. For kitchen use, there were the *mortaria*—wide flat dishes, sometimes with grit embedded in the surface, for pounding food; the *guttus*, or oil vase; the *colus*, or colander.

The Romans were familiar with the throwing-wheel, and many of the vases show signs of being turned and polished on a lathe. The enrichments are, in many

cases, such as are produced on the lathe; others by means of a revolving tool or "runner." The ordinary glaze on the Samian and Aretine wares is very thin and transparent, apparently siliceous; but of the exact nature of its production there is no information.

The baked bricks so largely used were called *cocti*, or *coctiles*. The clay used—generally white or red—was well ground, and mixed with straw. After kneading, a mould or frame of wood gave the desired size. There were several shapes:—the *Lydion*, a foot and a-half long, and a foot broad; the *Pentadoron*, measuring five palms each way—this was used in public edifices, and the *Tetradoron*, four palms each way, for private buildings; the *bipedales*, or two-foot bricks; the *sesquipedales*, the one and a-half foot bricks; an average thickness for all sizes was two inches. After making, they were laid out in the sun to dry; some have been found with the marks of the feet of animals and birds which passed over them while soft; at York, one was found marked with the nails of a boy's shoe. A favourable season was selected for the making, the spring being considered the best time.

The roof-tiles, or *tegulæ*, were generally made with flanges, these being covered by semi-cylindrical tiles called *imbrices*. Inverted, similar flanged tiles were used for floors, especially in the hot rooms of the baths, the hollow section permitting the hot air to circulate underneath. Tiles were also frequently used for form-

ing tombs of soldiers, and in many cases are stamped with the initials of the legion to which the dead man belonged. Flue-tiles and pipes ornamented on one side are often found in the ruins of Roman houses, some of the rooms appearing to have been lined with them, forming hollow walls. *Tubuli*, or pipes, were used for land-drains, many a marsh having been rendered salubrious by their use. The marshy valley of Le Seille, in Lorraine, was made habitable by immense quantities of burnt lumps or rolls of clay being thrown in; the place is known as the Briquetage de Marsal.

For a considerable period the brick and tile makers were by law obliged to place their mark upon their productions, and these marks have thrown very valuable light upon obscure points in Roman history and manners. A typical example on a tile in the British Museum reads, "Pot work (*opus doliare*) from the Publinian potteries, from the estate of Æmilia Severa." The most complete stamps have the date, the names of the estate and pottery, the owner of the pottery, and the slave who made the tile. Names of emperors and empresses often occur as owners of estates. When at Rome, the legionaries obtained their pottery from officially-appointed makers, but when stationed abroad in one or other of the provinces of the vast empire, the soldiers themselves seem to have been the potters. By means of their stamped tiles, the routes of the

thirty legions have been traced in a very remarkable manner; the tenth, for instance, is shown to have stayed in such diverse directions as Caer, Rhyn, Voorburg, Nimeguen, Vienna, and Jerusalem.

The inscriptions found on the lamps are hardly less interesting than those on the tiles. The trade marks were mostly of a simple kind, such as circles, half-moons, a foot, wheels, palm-leaf or vine. A large proportion of the lamps, bearing only single names, were made by slaves. Some of the potters were freedmen; one, whose name occurs on both lamps and tiles, being Tindarus, the freedman of Plotina Augusta, the wife of Trajan. Occasionally a group of three names in the stamp denotes that the potter was a Roman citizen; but that potting was considered somewhat *infra dig.*, seems certain. It is recorded as an instance of the low tastes of Commodus that in his youth he had amused himself with making pottery. To be a potter was evidently to be one of no social standing; a potter was only a potter, and not an artist.

CHAPTER III.

MEDIÆVAL POTTERY.

WITH the fall of the Roman Empire, pottery in Europe seemed to be dead. The northern tribes knew little more than how to make their sepulchral urns by hand, and decorate them by the same primitive means as those used long before in Etruria and prehistoric Greece, Gaul, and Britain. The idea of the queer little hut-shaped boxes or urns found among the Etruscan relics, is repeated in the "fairy-huts" of the early Germans, which, occasionally found in excavations, were often regarded by the German peasants as being the work of elves, or to have grown up spontaneously and magically.

On the departure of the Romans from Britain, such arts as had been in use were soon forgotten. The villas and temples, rich in mosaic pavements, painted walls, and pottery of all kinds, were destroyed, and their ruins

soon became overgrown and lost to memory. Only in these later days are the sites being excavated, some accidental turning-up by the ploughshare of a vase, or coin, or fragment of mosaic being often the only clue to the interesting remains lying there undisturbed under the corn-fields or pasture-lands. The knowledge of the potter's wheel disappeared; the important industry of brick and tile-making apparently almost died out in England. The Saxons brought with them no more knowledge of the potter's art than might be imagined from their North German origin. Their sepulchral urns are coarsely made by hand, like all the Teutonic wares of that period.

INCRUSTED TILE, FROM THE PAVEMENT OF A CHURCH OF THE MIDDLE AGES.

It is not until the time of the Crusades that a sudden development can be noticed. In North Germany in the buildings erected by the Teutonic Knights, a great use was made of terra-cotta blocks and enrichments, and all over England and France there was a great demand —continuing through three or four hundred years—for

pavement tiles for the churches and abbeys. Many of these have very elaborate patterns, either heraldic or based on natural designs; the body of the tile or thin brick is of red clay, faced with a thin layer of white clay, or impressed with a pattern into which the white clay has been inlaid. The glaze over the whole is generally yellow, but green and brown glazes were also used. The pavements in Chertsey Abbey, dating from the thirteenth century, and those of fourteenth and fifteenth centuries at Malvern and Malmesbury are very well known examples, but there are many others, more or less perfect, scattered among the old churches. The patterns are best seen where the tiles have been placed in corners or against the walls; where they have been exposed to traffic, the soft glaze has been worn through and the designs obliterated. A rather regrettable feature of the earlier years of the Gothic revival of this century, was the rabid way in which these characteristic features of the mediæval churches were imitated with cold mechanical accuracy, and every new or restored church must needs have its encaustic tile paving, harsh to the tread, harsh in colouring, and warranted never to wear out.

There can be but little doubt that these tile-pavements were suggested directly by the intercourse with the East brought about by the successive Crusades. Although these pious and enthusiastic expeditions failed in their object of wresting the Holy Land from

the Saracens, they were fruitful in many other ways, and the arts of Europe, during the middle ages, owed not a little to the influences of Moslem architecture and decoration.

It was in *Persia* that the ancient traditions of pottery had been preserved. The effects of colour and glaze that appealed to neither Greek nor Roman, were known and used with masterly power by the Persian potters. Although their country was repeatedly overrun by conquering armies—by Greeks, Parthians, Arabs, Moguls and Turks successively—the Persians retained their national individuality, and seem always to have impressed their artistic ideas upon their new rulers. When the followers of Mohammed swarmed over Persia in the seventh century, they found a high degree of luxury prevalent. Ignorant of art themselves they seem to have been captivated by the beauties of Persian art, and it was not long before the mosques which they hastened to erect in every conquered land were being designed for decorating with enamelled tiles—a form of pottery manufacture which it will be remembered had been carried to great perfection in the early Persian cities of Susa and Persepolis. Wherever the Mohammedan religion spread, there went with it the demand for tile decorations for the mosques, and Persian workmen, or Arabs trained by Persians, followed the conquering crescent. The Arabs were masters in eighty years of as great an empire as that which had occupied

Rome four hundred in the gaining. They spread through Tunis, Algeria, and Morocco, eventually crossing the Mediterranean to Spain, Sicily, and Italy.

The old Assyrian love of the chase was still strong in Persia, and subjects suggested by it formed the principal motives of decoration, when the Mussulman conquest took place. For a time, owing to Mohammedan scruples, not to say absolute prohibition, representations of the human figure and of living things had to disappear from the Persian decorations, and the most dreadful chimeras and mixtures of animal forms had to satisfy the craving of the artist for something more than the conventionalised leaf-forms — beautifully decorative though these are — could give him. A creature which was said to exist in Paradise, and is one day destined to carry Mohammed on its back, is typical; it was called "hedgehog's feet," and had stag's legs, a tiger's tail, and a woman's head. As time went on, however, it occurred to the Persian artists that a way of evading the dreadful responsibility incurred by the depicting of anything living, could be found by representing them as imperfect or mutilated; a head without an eye, for instance, or a line round the throat (as if cut) were sufficient to indicate that a spirited hunting-scene, full of life and movement, was, after all, harmless, and only a piece of innocent decoration.

Great skill was eventually attained by the Persian potters in the production of still larger tiles or plaques;

some as large as eight by six feet are known. The range of colours is not extensive; blue, green, purple, and a little red, with the white ground of the ware, form the basis of the innumerable combinations with which such beautiful effects were produced both on the tiles and on the numerous forms of bottles, vases, plates and bowls due to the ingenuity of the potter. The Persians were from an early date acquainted with the secret of lustre painting, where the colours assume different metallic tints when looked at in different

PERSIAN BOWL, METALLIC DECORATION, BLUE ENAMELLED OUTSIDE.

lights. Most of the genuine specimens have been obtained from the ruins at Rhages, a city not far from the Caspian Sea, destroyed in the year 1250.

A centre from which large quantities of pottery emanated was *Damascus*. Except that figures do not form part of the designs, the general character of the work is Persian in style. There is in the British Museum a lamp from the Mosque of Omar at Jerusalem; it is signed by "the poor and humble Mustapha," and dated in the year 956 of the Hegira (A.D. 1549). Another important group of pottery showing Persian influence

is that known as *Rhodian*. A legend has it that a vessel bound for Venice was captured by the Knights of St. John of Jerusalem somewhere about the year 1300, and a party of Persian potters being found on board, they were conveyed to the Island of Rhodes—then belonging to the Order of St. John—and bidden to work. For about 100 years—whether this was the origin of the manufacture or not—there prevailed in Rhodes and the Levant generally a type of brilliant enamelled faïence, in which the principal colours are white, blue, green, purple, and a vivid heavy red that sometimes seems hardly in keeping with the other colours. The body is of buff coarse texture coated with a siliceous slip, and glazed with an alkaline glaze, under which the beautiful turquoise produced from copper, the copper green, and the manganese purple, are developed with a peculiar brilliancy. The shapes of these Rhodian wares are generally somewhat heavy, and do not compare favourably with the thinner and more graceful Persian forms. So highly esteemed was the ancient Persian pottery that it was largely exported to the countries of Europe, and plaques of it have even been found embedded in the walls of Italian churches of the twelfth and thirteenth centuries.

Throughout the northern parts of Africa the characteristic faïence tiles are found covering the walls of the mosques. The city of Tlemcen is well known to artists for the beautiful effects of the masses of blue-and-white

tiling glistening in the sun. The earlier examples of Saracen architecture, designed most probably by artists from Byzantium, partake of late Roman and Byzantine character; but it was not long before the distinctive style we know as Arabian, Moorish, or Saracenic was evolved. In the mosque of Cordova, in Spain, begun by Abd-el-Rahman in 786 (the Arabs had conquered Spain in 711), the characteristic horse-shoe arch is already in use in a lavish and daring fashion, interlacing and crossing the numerous aisles of that famous edifice. The walls are decorated with ornamental tiles of the same date. Another very special feature of Saracenic art, the so-called stalactite work, or corbelling out by means of shaped bricks or worked plaster, is seen in its rudimentary form in Persia; but was most ingeniously developed by the Arabs. The best known examples of this are, of course, in the palace of the Moorish kings of Granada at the Alhambra, which, although much injured by neglect and mutilation at the hands of later builders, still is a fairy palace, gleaming with jewel-like brilliancy. Contrasting with the white marble carved into lacework are the elaborate plaster decorations coloured in red, blue, and gold. Forbidden to introduce animals or figures into the designs, the inventiveness of the Arab designers ran riot in a bewildering maze of interlacing ornamental forms of great beauty. Even the texts in Arabic, modelled across the patterns, or confined within bands or panels,

partake of the ornamental. So pleasant to the eye are the flinging careless lines of these inscriptions—not only on the Alhambra walls, but on the Arab pottery—that inattentive workmen in copying sometimes did not trouble themselves to see if their lettering meant anything, but merely joined one rambling character to another because it looked pretty.

The wall tiles in the Alhambra courts are pieced together in complicated geometrical patterns in a style more suggestive of ancient Egyptian work than of the painted Persian tiling. The colours are quiet and harmonious—green, yellow, purple, white, and blue—each shaped tile having only the one colour in opaque enamel on its surface. The shapes interlock into each other in a very ingenious manner.

During the continuance of the Moorish dominion, and for some years after—Ferdinand and Isabella overcame the Moors in 1492—there was great activity in pottery making. It especially manifested itself in a style of lustred pottery that is now known as *Hispano-moresque*. There were but few tints used—a golden yellow, a coppery red, a changeful blue, and the white ground—but the effects are most brilliant and exciting. From Malaga there proceeded large quantities of ware decorated almost entirely in yellow lustre. This beautiful "golden pottery" was exported to the most distant countries, and there are splendid and valuable specimens to be seen in our museums. Of the same

class of ware were the three famous Alhambra vases, found under the floor of the palace some 300 years ago, and of which only one is now said to remain. It is four feet three inches high, and profusely ornamented with the favourite Saracenic interlacements, painted with golden-yellow lustre and blue. These lustres were painted "over glaze" on the tin enamel masking the earthenware body; and to produce such large and gorgeous pieces, in what, as we have already seen, is a most difficult and uncertain process, shows the Moorish potters to have possessed a very high degree of skill.

Malaga gradually lost its pre-eminence as a seat of this manufacture, and Valencia became famous. It had, indeed, been celebrated for its red Samian ware in Roman times, and as early as 1239, on its conquest by James I. of Aragon, its ceramic industry was sufficiently well known to call for a special charter from the king, in which is set forth "that every master potter making vases, table ware, tiles, wall tiles, shall pay annually one besant for each kiln, in consideration of which he may freely exercise without any servitude." In 1517 it was written that "although in a great many places of Spain they make excellent faïences, the most esteemed are those of Valencia, which are so well worked and so well gilded." The oldest pieces of Valencian work are similar to those of Malaga; the yellow lustre is blended with blue, with a more sober effect than is found in the fiery copper-reds and browns

of the later work. A conspicuous feature of the Valencian designs of the Christian period is the representation of an eagle, the emblem of St. John the Evangelist, and the introduction of the first words of his gospel, "In principio erat verbum, et verbum erat apud Deum."

Similar lustred vases to those of Valencia were made at Barcelona, Manises, and elsewhere in Spain; in Sicily; and very largely in the Balearic Islands, the largest of which group, Majorca, has given its name (Majolica) to the Italian enamelled wares that were made in emulation of the Moorish productions. Majorca had been conquered by the Christians in 1230; Minorca remained in the hands of the Moors till 1285. Under Christian influence, the Moorish potters began to imitate the Valencian inscribed wares, but frequently misspelt the Latin, and in some cases wrote it backwards. For many years the traders of Italy resorted to these islands for their brilliant potteries; but the industry came to an end on the final expulsion of the Moors from the Spanish dominions. Finding it impossible to convert the followers of Mohammed speedily enough, the Catholic zealots drove them out, and in doing so dealt a fatal blow to the art industries of Spain.

We may turn now to Italy, in which country the potter's art received its next great development—viz., that known as *Majolica*. There may have been lingering traditions of pottery-making through the centuries

that had elapsed since the break-up of the Roman power, but there seems to have been no definite manufacture until the prevalence of the Moorish wares excited emulation. Some of the earliest Italian mediæval pottery is almost Persian in feeling, and it is quite possible that Persian aid was called upon in its production. About the year 1350, if not earlier, there was a manufacture of pottery at Pesaro, in the Duchy of Urbino; the body of red clay was covered with a slip or thin coating of white clay to serve as a ground for the paintings. These were applied after the piece was biscuited; the colours employed were yellow, blue, and black, and the glaze was based on lead, which sometimes acquires a kind of iridescence, different in quality, however, from the actual metallic lustres of the Moorish work. Such lead-glazed pottery came to be called *Mezza-majolica;* and, although overshadowed by more perfect methods, it is still made.

The class of ware that was specially known as Majolica soon lost whatever similarity it may have had to the Moorish wares that suggested its name. Its great peculiarity of an opaque tin-enamel, which completely hides the buff earthenware body, is responsible for its somewhat cold and dead scheme of colour. For long it was thought that the invention of the tin-enamel was due to Italy; but, as we have seen, its use can be traced to much more remote periods. It may have been re-discovered by Italian workmen; it was

more probably revealed to them by some wandering potter from the East. Its use is very closely associated with the names of a family of modellers called Della Robbia, Luca, the head of the family, having been the first to perfect the process. Like so many of the Renaissance artists, Luca della Robbia followed many callings. Born in Florence about 1400, he was at first a goldsmith. In 1438 his celebrated marble bas-relief of singing boys was executed for the organ tribune of the Duomo at Florence; and it brought him so many commissions for sculptures that he looked about for some more expeditious method of reproducing his models than by carving them in marble. It has been thought that he found what he sought at the little town of Caffaggiolo, where some potters using tin-enamel suggested the coating by its means of Della Robbia's clay figures. He must have experimented with clays and enamels, and succeeding in producing an enamel of singular whiteness and purity, he utilised his new method for the first time in 1440 on a bas-relief of the "Resurrection," still to be seen in the cathedral of his native city. It has pure white figures on a blue ground. He afterwards added in later works a green (rather crude), a violet, and a yellow. Most of his works are to be found in the neighbourhood of Florence. Apart from their interest as specimens of ceramic work, the style of the modelling, and the simple reverent feeling displayed are very noteworthy. At

South Kensington Museum is a set of twelve large medallions representing the "Months." They are in low relief, with figures in each, engaged in some labour appropriate to the month represented; the colouring is very quiet, consisting of only three shades of blue, a yellow sun, and a white (now showing cream-colour) on the modelled border. They have unfortunately warped in the burning to an extent that would be thought fatal by a modern potter. There is also at South Kensington Museum a large circular medallion, eleven or twelve feet in diameter, built up in sections, with the deep border of fruits and vegetables (coloured *au naturel*) that so often figures in the Della Robbia works, sometimes, it must be confessed, rather obtrusively and inappropriately.

Luca della Robbia died in 1481, and his work was carried on by his nephew, Andrea. A well-known example of his work is the very beautiful series of medallions of swathed infants which decorates the courtyard of a hospital at Florence. His bas-reliefs and altar pieces are very numerous, but his modelling has certain mannerisms, and his borders of fruits and cherubs' heads are sometimes too heavy. On the death of Andrea, in 1528, his four sons, Ambrosio, Giovanni, Girolamo, and Luca, continued to work in the same style. The third-named went to France, and under his direction the Château de Madrid at Paris was decorated profusely with enamelled pottery. This

"Château de faïence," as it was called, was completely destroyed during the French Revolution. By Giovanni, the second son, was the coloured frieze of figures at the Ceppo Hospital at Pistoia, erected about 1525. A copy of this interesting work is fixed in the Architectural Court at South Kensington Museum.

CUP WITH GROTESQUES FROM CAFFAGGIOLO.

Similar work to that of the Della Robbias was produced by various pupils, among them Agostino da Duccio and Francesco of Pisa, the latter finding his way to Spain, where he decorated the Church of Santa Paula at Seville. Early in the sixteenth century, however, the production of this kind of ware ceased,

although the use of tin enamel became general as a ground on which to paint the characteristic Renaissance designs that are esteemed as the glory of Italian pottery. The term *Faïence* is as often applied to Italian painted ware as *Majolica;* whether the town of Faenza in Italy, or that of Fayence in French Provence, really gave the origin of the designation seems uncertain. As the term Faïence can be, and is frequently used to describe wares dipped in a glaze that permits the body of the ware to be seen, whereas the word Majolica is never extended to include such wares, it seems best to retain the latter term to designate the series of Italian works now to be mentioned. In all of them the red or yellow body of the ware, when biscuited, is hidden by a coating of tin enamel (or, strictly speaking, a lead glaze in which oxide of tin had been introduced) on the dry, absorbent, and "touchy" surface of which the paintings were executed as rapidly and skilfully as possible; the outlines had to be drawn with a single stroke, and no retouching or erasing was possible; even a momentary hesitation with the brush-point would lead to an unintended thickening of the line. Placed in the furnace again (sometimes dipped in a fresh bath of thin glaze) the powdery covering fuses, and the painting, sinking into it, assumes a degree of brilliancy and richness peculiar to this method. This second firing was in some wares complicated by the special precautions necessary to produce

the metallic lustres which have made some groups of Italian majolica so famous.

Foremost among these groups is that formed by the wares produced at *Gubbio*, a small town in the duchy of Urbino. Here a certain Maestro Giorgio Andreoli, a man of good family in Pavia, settled about the year 1500, and began to produce pottery in the style of the Della Robbias, with this difference, however, that he preferred to leave the flesh surfaces of his groups uncovered by the enamel. He had, while still at Pavia, been working with lustre, and doubtless many undated pieces in his style occupied the years that followed; but it is not till 1519 that the first pieces signed in lustre colours with his usual mark occur. Many very fine works bear the date 1525; one grand piece with a representation of Diana and her nymphs bears on the back in gold lustre—

"Mastr° Giorgio da Ugubio adj 6 d'Aprile 1525."

The "master" was most certainly a master of the art of lustre; his ruby reds, copper, and mother-of-pearl, are considered to be unrivalled. He was even asked to contribute his lustreing to pieces painted by others. After his death (about 1550), the method, carried on for a time by his son and assistants, gradually deteriorated, and finally ceased about the end of the century.

A very common shape, occurring again and again in

Italian majolica, is a round plate with a deeply sunk centre; so strangely wedded to this shape were the potters that they often disregarded the deep hollow and painted their figure compositions across it without any qualms, producing in most cases awkwardly broken lines and distorted figures. A designer now-a-days would probably have a little more regard for the shape

PLATE OF URBINO BY ORAZIO FONTANA.

of the piece he was decorating, and let it control the spacing of the design.

From the cities of *Castel Durante* and *Urbino* distinctive styles of ware proceeded. As early as 1361 mention is made at Durante of a Giovanni dei Bistugi, John of the biscuits (*i.e.*, of terra-cotta), but not till

about 1500 do the characteristic decorations appear; at their best about 1530, they came to an end some fifty years later. The body is of pale buff colour; the glaze is rich and pure. Great use is made in the designs of grotesques, trophies of arms and instruments, painted in a grey tint on a blue ground. Not many "subject pieces" came from Castel Durante; some plaques with large portraits are, however, believed to have originated there, among them one, now at South Kensington Museum, with a portrait of Perugino. One of the studios at Castel Durante was under the direction of the Cavaliere Cipriano Piccolpasso, who wrote an account of the methods of making majolica in Italy in use at his time. To this treatise, written in 1548, is due almost all the information we have relating to the actual processes employed, the shapes in vogue, and the names by which they were known, the kinds of clay in use, where to find them, how to prepare them, how to form the vases, jugs, drug-jars (large numbers of which were made at that time), basins, and so on. One shape he describes, is a variety of our old and universal acquaintance, the puzzle-jug; in this case it is a spouted jug with a lid that cannot be lifted off. And how to fill the jug is not apparent until you turn it upside down and see an opening in the foot. Then Piccolpasso gives the recipes for preparing the colours and glazes, and names the special ovens required; the brushes, made of goats' and asses' hair, or (the finest) of

the whiskers of rats and mice; finally, he describes the construction of the kilns both for his own style of work, which was not lustred, and for the lustred wares made by his contemporaries. He waxes eloquent over the lustred ware (as have, since his day, many other artists);

PLATE OF CAFFAGGIOLO WARE.

he says: "True the art is beautiful and ingenious, and when the pieces are good they pay in gold;" but the process is very uncertain, frequently only six pieces being good out of one hundred.

The names of several artists who worked at *Urbino*

are known to fame, among them Nicola da Urbino, Francesco Xanto, the Fontana family (the first representative of which, Guido Pollipario, came from Castel Durante originally, and the second, Orazio, his son, became the greater artist), and, coming later in the sixteenth century, the family of the Patanazzi. Of these, Xanto signed his works, but the Fontani seldom. Most of the decorations proceeding from Urbino are in the style of Raffaelle, their celebrated townsman; in fact, a large number of the figure compositions are copied or re-arranged from pictures by that master or others of the same school. The modelled shapes, whether ewers, pilgrim-bottles, vases, or salt-cellars, are generally very beautiful, and their so-called "Urbino arabesques," on the clear white ground, represent the culmination of painted Italian pottery.

Of other Italian schools we must speak at less length. From *Caffaggiolo*—already mentioned in connection with Della Robbia—and its offshoot, *Siena*, there came a class of decorated wares in which a pure white ground, a thick dark cobalt blue, an opaque orange, and a bright clear green are conspicuous. In South Kensington Museum there is a well-known plate (bought for £120) with a representation of a ceramic artist at work upon a similar piece painting the ornamental border, while a nobleman and his lady, seated in front, are looking on.

At *Pesaro* lustred ware was made, and a speciality of the manufacture seems to have been the painting of

plates with portraits and love mottoes. The studios here were under the very autocratic patronage of the Sforzas, who passed edicts forbidding imports of other earthenwares. There is a letter extant from Lorenzo the Magnificent to Roberto Malatesta, thanking him for a present of his earthenware, in which he says, "They please me entirely by their perfection and rarity, being quite novelties in these parts, and are valued more than if of silver, the donor's arms serving daily to recall their origin."

Faenza was the birthplace of a distinctive class of decorations of great beauty, consisting of fine arabesques in shaded white on a blue or grey ground. Somewhat similar work came from *Forli* and *Ferrara*. From *Deruta* came some designs with blue grounds and yellow lustres. From *Venice*, among other pottery, there came a ware in which the buff body was covered by a grey glaze, known as "Smaltino," upon which the design was painted in blue, with high lights in white.

And finally, to close our notice of Italian mediæval work, we may mention the Graffito or Sgraffiato wares that were produced specially at *Castello*, near Gubbio, in which the designs were scratched through a slip of white clay into the red body, and the piece dipped in a lead glaze, coloured in a clouded way by yellow, green, blue, or black. No tin entered into the composition of this ware, and we may not, therefore, class it with the majolica.

It may be interesting to notice that at the Fountaine sale in 1884, some of the Italian examples fetched very high prices. A Faenza plate, dated 1508, was bought for £920; another at 620 guineas; an Urbino oval dish, 1270 guineas; and two lustred dishes by Maestro Giorgio, 730 and 780 guineas respectively.

By the year 1600, the production of Italian majolica had practically ceased. Here and there a few works were kept up, but in the general waning of art from that time onward, pottery shared, and not till the imitation of porcelain in the eighteenth century was attempted all over Europe, is there any important Italian advance that can be mentioned. The Italian terra-cottas of the Renaissance are extremely fine. Some of the churches of Lombardy, where stone was scarce, are grandly built of brick with terra-cotta enrichments. The Certosa (or Carthusian Monastery) at Pavia is an extraordinary ornate example. In the later Renaissance brick was used only for hidden work; it was thought too vulgar a material to employ artistically.

In *France*, the Italian Renaissance very largely influenced all branches of art, and among them, the production of pottery. The green-glazed common wares that appeared as the best that the potters of Beauvais, Saintes, Rennes, or Bordeaux, could produce, had to be superseded in the houses of the rich by pieces decorated in the new Italian style, and several Italian potters hastened to take advantage of the

opportunity by starting workshops in France. At Lyons, Nantes, Amboise, Machecoul, and Le Croisic, among other places, artists with the secrets of Faenza, Pesaro, Caffaggiolo, and Forli, began to experiment with local materials. On the other hand, a few French craftsmen gained a reputation in independent work, such as Abaquesne, Palissy, and the makers—until recently, unidentified—of the Oiron or Henri Deux ware.

At the Château of Ecouen, near Paris, there are some enamelled tiles that were for a long time attributed to Palissy, but documents have been discovered which prove that at Rouen in the early part of the sixteenth century there was a manufactory of "tiles of enamelled earth," under the direction of Masseot Abaquesne. One of these tiles bears the inscription—"À Rouen, 1542." The Château belonged to the Constable Montmorency, one of Palissy's patrons. Abaquesne had, in 1535, decorated a "salle faïencée" in the Havre Town Hall, and is known to have made pavement tiles for other buildings as well as large numbers of drug-pots for apothecaries. His widow and son Lorenzo seem to have carried on the works, for a document in the archives at Rouen records their undertaking to make and furnish to the Abbot of Coullomby "the number and quantity of four thousand tiles enamelled in the colours blue, white, yellow, and green; good, loyal, and saleable goods, all containing in

each way three inches exactly, and according to the picture the said Durand (the widow) has given into the hands of the said Sieur Barat (the Abbot's attorney), among which pictures is figured a tile with four peacocks in square," etc., etc. The widow was to be paid thirty-six livres for each thousand of the tiles. (The whole document is to be read in Jacquemart's History.)

FINE FAÏENCE OF OIRON.

Of a technique very different from all other ceramic work of its time is the decorated earthenware already alluded to as *Oiron* or Henri Deux ware. The true story of this highly-sought and valuable manufacture has only been discovered within the last thirty years; there are not a hundred pieces of it known to be in existence, and those that are identified are worth their weight in gold. There are a few small pieces in a special case at South Kensington Museum; they do not look very important, but the labels disclose the fact that one, an oval dish, cost £450; another, a candlestick, £750; and

a third, a little salt-cellar, £300. At the Hamilton Palace Sale in 1882, a small cup fetched £1218, but this was altogether put in the shade in 1884 at the Fountaine Sale when a candlestick, 12¾ inches high, sold for £3675. From the frequent recurrence of the monogram of Henry II. (of France) in the decorations of the earliest pieces of this ware that came under notice, it was first known by the name of that monarch. Researches have brought to light that beyond this monogram the ware had no special connection with the king; it seems to have been made at the country house of, and specially for, the Lady Hélène de Hangest, widow of Artur Gouffier, at one time Grand Master of France. The Lady Hélène, a learned and artistic dame, on retiring from the Court of Francis I., and its atmosphere of Renaissance magnificence, passed her summers at the Château of Oiron, which her husband had intended to rebuild in the new style then coming in (which we know as Francis I.). Here, under the care of François Cherpentier, a potter, and Jehan Bernart, her librarian, the good lady amused herself by the production of some very highly finished faïence, bearing, among the decorations, the coats-of-arms or monograms of her relations and friends, doubtless presenting the pieces when finished to those individuals. Truly, a most admirable hobby! The material of these pieces is a fine white pipe-clay; the interlaced arabesques and diapers—very similar in design to those found

on book-bindings of the time, and herein seeming to show the influence of the librarian—were produced by means of metal stamps. Into the sunk lines so obtained, coloured clays were inlaid, and very carefully cleaned off level with the surface. Enrichments were added, either modelled on the surface, or stamped from moulds and stuck on; then the whole was dipped in a thin lead glaze, giving the white ground a yellow tinge. On the death of Lady Hélène in 1537, her son, Claude Gouffier, continued the manufacture, but the forms of the pieces made became more architectural and pretentious, and by the time of the accession of Henry II. in 1547, the details of the work are somewhat clumsily executed, and the colours are less pure. Some of the latest pieces suggest in their ornaments the influence of Palissy, who by that time was becoming famous. In the Chapel of the Château at Oiron there still remains a pavement of enamelled tiles, formed of the same body as was used for the faïence we have been describing, but painted with tin enamels, the pale blue arabesques surrounding brightly-coloured monograms and escutcheons of Claude Gouffier, his family connections, and of Henry II.

To find the use of tin enamels here is the only link that connects the Oiron ware with its contemporary productions in ceramics; otherwise, it stands quite apart as a fine faïence, perfect in itself, but leading to no development.

Notwithstanding all that has been discovered and written of *Bernard Palissy*, there is still a great deal to learn concerning this extraordinary man, perhaps the best known of all French potters.

Of his birth and birthplace, nothing certain is known. It is believed that he was born about 1510 at La Chapelle-Biron in Western France, and as the son of an artisan, received but the merest smattering of an education. At an early age he began working as a glazier and glass painter, continuing his education and studying art as best he could, until, finding local means exhausted, he determined to travel. He wandered through the south of France, Germany, the Low Countries, and the Ardennes, working and "keeping his eyes open." By the time he came back to his native province once more, he had found out many things in natural history, chemistry, geology, and was something of a philosopher. Then in 1539 he married and settled at Saintes, to gain a living as glass-maker and land-surveyor. Here perhaps he would have worked out a calm and unheard-of existence, had it not been for the chance that brought to his hands a piece of pottery of such excellence that it excited him to a remarkable degree. What the piece was is not known, but it is conjectured to have been a piece of the new Italian majolica made at Ferrara. Palissy says in his autobiography "an earthen cup was shown to me, turned and enamelled, of such beauty, that henceforth I entered into dispute with my

own thoughts, bringing to my memory several jesting proposals that some had made me, when I was painting images (*i.e.*, on glass). Now, seeing that they were beginning to give them up in the country where I lived, and also that glazing was not in great request, I thought that if I could discover the invention of making enamels, I should be able to make vessels of earth and other things of beautiful arrangement, because Heaven had given me to understand something of painting; and thenceforth without considering that I had no knowledge of argillaceous earth, I set about seeking enamels like a man who gropes in the dark."

He made endless experiments, preparing all sorts of combinations of materials, building furnaces for himself, or getting trials fired for him in the furnaces of some friendly glassmakers. Nothing succeeded, and after years of struggle all his available resources were gone, notwithstanding the assistance an occasional employment in surveying would bring him. Now and then a trial would be drawn, which, although imperfect, would fill him with fresh hope, and serve to pacify his clamouring creditors. Having by superhuman exertions built a new furnace, carrying the bricks, mixing the mortar, and doing everything else himself, he fired his pieces for six days and nights without getting the enamel to melt as it should. Afraid to waste the heat by letting his furnace cool, he started again to grind up fresh mixtures, but before these were ready his supply

of wood failed. What to do now? "I was obliged," he says, "to burn the props which supported the trees in my garden, which, being burned, I was obliged to burn the tables and floors of my house to make the second composition melt; I was in an agony that I cannot describe, for I was all dried up and parched from the work, and the heat of the furnace. My shirt had not been dry for more than a month, and also to console me they laughed at me, and even those who ought to have helped me, went crying about the town that I was burning my floor; and by these means made me lose my credit, and they thought me mad."

Another furnace had eventually to be built, and in the great heat necessary to fuse the enamels, the pebbles in the mortar began to burst and send their splinters all over the pieces, which otherwise were properly fired. His creditors hastened to him, even offering to take the least damaged pieces in part payment of their long out-standing accounts. Perhaps Palissy was mad by this time. He broke to pieces the whole of the batch, because to let them go would, as he says, "have been a discredit and lowering of my honour. I laid myself down for melancholy, not without cause, for I had no longer the means of supporting my family. I met with nothing in my house but reproaches, and instead of consolations I only received maledictions."

However, he was not without grounds for hope; the enamels had melted as he wished. Accidents must be

guarded against by better care in building the furnace. Again was a batch ruined by ashes. Even when this was prevented by firing the work in saggers, his furnace heated unequally, and the enamels were rarely obliging enough to fuse at the same temperature. It was, in the end, only after some fifteen or sixteen years that he succeeded in producing the coloured enamels that distinguish his ware. The white enamel that he was always seeking for, he apparently never succeeded in attaining.

Palissy's most characteristic style is shown in his rustic pottery—"rustiques figulines;" his dishes, cups, or vases were decorated with fishes, reptiles, shells, and leaves moulded from the actual objects and arranged in natural positions. This method of decoration does not strike one as being very artistic, however ingenious it might have been. That Palissy could do better work was soon evident. Becoming involved in the religious troubles of the time, for he had ardently embraced the Protestant religion, he was only saved from condemnation as a heretic by being appointed (through the influence of the Constable Montmorency) "Inventor of rustic potteries to the king and queen mother," and was thus free for a time. He removed to La Rochelle, and eventually found his way to Paris, where he was allowed to put up a workshop in the garden of the Tuileries, near the palace which was then being erected for Queen Catherine de Médicis. (It may be noted in

passing, that the tile kilns [*tuileries*] originally occupying the site, gave their name to the palace.) Here, in the midst of all the activities of the court, Palissy could not help being influenced by Jean Goujon, Germain Pilon, and other sculptors of that busy time in French Renaissance, and his works became more refined in detail and architectural in design. In many, the human figure was introduced, the modelling being so excellent as to lead many writers to attribute it to other hands than Palissy's.

Although narrowly escaping death in the Massacre of St. Bartholemew (1572), Palissy was too notorious a Huguenot to remain long in freedom, and he ended his days at an advanced age in the Bastille. The young King Henry III. would have gladly set him at liberty if he would but turn Catholic. He should have to leave him, however, to his fate, if he would not conform. "Sire," the sturdy old potter replied, "I was already willing to give up my life, and could any regret have accompanied my action, it would certainly have vanished upon hearing the great king of France say, 'I am compelled.' That, sire, is a condition to which those who force *you* to act contrary to your own good disposition can never reduce *me;* because I am prepared for death, and because your whole people have not the power to compel a simple potter to bend his knee before images which he has himself made."

Palissy's productions do not bear his name. A few

pieces, produced probably to royal order, are stamped with the fleur-de-lis. The body of his pieces is a hard earthenware of pinkish-white pipe-clay; the enamels are very thinly painted, the colours being mixed with the lead and tin glaze. None of the colours are very

JUG WITH ORNAMENTS AND FIGURES. BERNARD PALISSY.

bright in hue, and rarely occur in flat tints, being generally mottled and blended with each other; the whole effect is often somewhat sour. The large ornamental cistern in the South Kensington Museum (bought from the Fountaine Collection for £1143) seems somewhat imperfect (although it is stated that

Palissy permitted none but perfect pieces to leave his hands); both the ware and the enamel have cracked in the burning, the blues have run, the purple is a very poor colour, and the greens are unpleasantly raw. And, to make an end of such criticism, one sometimes thinks that Palissy's productions have been overrated as pottery, and that his indomitable perseverance and self-reliance were, after all, somewhat wasted, for he found out nothing new, and occupied the best part of his lifetime in painfully acquiring by experiment the knowledge that an Italian potter could have helped him with in a few hours.

And, notwithstanding this, Palissy remains the most picturesque figure in the annals of pottery; a man whom adverse fortune only strengthened, and who, after all, is the best possible exemplification of the fact that it is practice, and not theory, that makes the potter.

He had imitators, perhaps pupils. In 1570 Nicholas and Mathurin Palissis are mentioned in connection with "grotto work" at the Tuileries. About 1600, the names of three "enamellers upon earth" are given in the lists of the king's officers. There was at Avon, near Fontainebleau, in 1608, a manufactory of enamelled pottery; reference is made to it in the Diary of Hérouard, physician to the Dauphin (afterwards Louis XIII.), who describes how the little prince (then seven years old) made up a sham collation for Madame de Guise,

with the coloured pieces he had bought at the pottery. There were dogs, foxes, badgers, oxen, squirrels, angels playing instruments, hurdy-gurdy players, sheep, a dolphin, and a capuchin friar. Pieces agreeing with this description used to be attributed to Palissy, but were clearly made, some years after his death, by some one working in the same style. A similar origin used to be assigned to certain architectural enrichments to be found in Normandy, such as terminations to gables and pediments, spikes, roof edgings, cupids, and so on, in enamelled faïence of different colours; investigation, however, shows that the enamels are colder in colour and less glossy than Palissy's.

There is every reason to suppose that by 1589, the year of Palissy's death, the use of tin in the glazing had become well-known in France. At *Nevers*, especially, the ware produced was at first quite in the style of Urbino. On the accession of Louis of Gonzaga to the Duchy of Nevers in 1565, Italian potters seem to have followed him to his new court, and taken with them their favourite styles of decoration and mythological subjects.

The pure Italian style of design never, however, obtained any permanent footing in France, and the suggestions for the characteristic wares to be produced at Rouen, Moustiers, and elsewhere, came from the Oriental pottery that, during the sixteenth and seventeenth centuries, found its way to Europe in large

quantities. Before sketching the further history of French pottery, it will be well to speak of the mediæval wares produced in Germany and England, and, in so doing, complete our survey of all the European wares that can be described as being of national growth, as yet uninfluenced by the efforts universally made during the seventeenth and eighteenth centuries to emulate the porcelains of the East.

Contemporary with Luca della Robbia, there was working at Nuremberg a celebrated artist, Veit Hirschvogel. In the church of St. Sebald are some windows by him, and in several museums are large pieces of pottery ascribed to him, richly modelled and enamelled in colours. The enamel has some resemblance to Italian majolica, but the colours are brighter. At South Kensington Museum, for instance, is a fine piece, with figures of Adam and Eve, in blue, yellow, green, white, and brown. Another of Hirschvogel's productions is a vase made to be given as a prize by a company of archers. It is in the form of an owl, the head forming the lid; the plumage is in white and blue, and on the breast is a panel containing the portrait figures of the archer's corporation. His son Augustine continued to make similar work, and by some writers is thought to have shown something of the process to Palissy during the latter's wanderings.

Large quantities of glazed ware stoves and tiles were made in Germany during the sixteenth century. There

is at South Kensington Museum a large closed stove by Hans Kraut, 1578; it is profusely modelled; for the most part glazed a dark, rich green, the tiles and mouldings seem to have had additional colour painted over glaze. At one side of the stove three steps lead up to a seat; evidently this was a warm corner. Standing near this, in the same Museum, is another large erection all in dark brown glaze; it was from Nuremberg, and dates from about 1630.

We come now to a class of pottery standing quite by itself, the stoneware known as "Grès de Flandres." Until the appearance of this ware in the sixteenth century, no real stoneware had been seen. Here and there, in Egyptian, Chinese, Japanese, and Roman wares, an occasional piece may be found fired so hard as almost to be a stoneware, but there is no trace of the characteristic, and only suitable, glazing with salt that distinguishes the Grès de Flandres. Even the wares of Beauvais, made early in the sixteenth century and sometimes placed by French writers among the stonewares, are lacking in this most definite respect. The body, it is true, has received a very hard fire, but is covered by an opaque enamel of dull blue.

As already mentioned (at page 38) salt-glazing is the simplest in the whole range of pottery-production, and it is somewhat surprising that its discovery did not take place at a much earlier date than was apparently the case. It requires a clay that will stand a great

heat, and as most of the processes we have hitherto been describing could be completed at comparatively lower temperature, there may have been no occasion or opportunities to experiment in higher heats. Mr. Solon hazards a guess that the mythical potter of Schlestadt who died in 1283, and was described as "primus in Alsatia vitro vasa fictilia vestiebat," may have discovered salt-glazing, for all other methods of glazing were already known by that time. There are no traditions of its origin extant in Germany. The earliest dated piece glazed with salt is a fragment of Ræren ware with 1539. Ræren is the centre of the *Flemish* stoneware district; the wares are of brown colour, probably from being fired with coal, the Liege coal-fields being in the vicinity. At Siegburg, near Cologne, the *Rhenish* stoneware was produced; and from a group of small towns near Coblentz—Höhr and Grenzhausen being the best known—came the wares grouped as *Nassau* stoneware. The colour of the two last named wares was greyish white, possibly from being fired with wood. The necessary salt was, no doubt, acquired through the Low Countries, and it is said that the red salt, in which Newfoundland fish had been preserved, was thought the best.

At Siegburg, pottery had been manufactured from an early date, but it was apparently of a coarse nature, and unglazed. The often-mentioned "Frau Jacoba's Cannettes" were of quite the same nature; goblets

mostly of rude finish, brown-grey in colour, without ornament or glaze. These used to be considered the forerunners of the salt-glazed ware, but have really no connection. The story, somewhat discredited now, runs that these cannettes were made to solace the enforced leisure hours of Jacqueline, Countess of Hainault in Holland, who was imprisoned in 1424 in the fortress of Teylingen. She is said to have conceived the idea of making these stoneware pots, and throwing them into the moat of the castle that they might be found in after years as a record of her troubles. It is true that on the spot there have been found large numbers of these things, but they bear no inscriptions, and seem to differ in no respect from other rough wares made about the same time at other places. Similar goblets have been found in London, and were among the earliest made at Siegburg. By the beginning of the sixteenth century, however, the local potters had evidently come upon a bed of fine white clay, which is still found in the neighbourhood. This clay is easy to "throw," and the Siegburg makers began to make highly-finished pieces, richly ornamented with stamped enrichments, coats-of-arms, architectural details, masks, wreaths, figures of saints, etc. Researches on the sites of the old potteries, and in the town archives, have brought to light much curious information respecting the old manufacture. The potters had a kind of trades union; their rules allowed them to work only certain

months in the year, and to do only a certain number of pieces in a certain time; very jealous too of outsiders, they allowed strangers to work only on the coarsest wares. Tithes were levied by the abbots of the district upon all the pots made, but the town records disclose some amount of underhand dealing and evasion. A favourite shape made is the Schneller, a long tankard for beer. The name ("fast-goer") evidently refers to the proper way to drink the contents.

It is a curious fact that the improvement in stoneware brought about by salt-glazing coincides with the demand for beer-drinking vessels. The coarse malt liquor drunk by the lower classes was giving way before the new kind of ale flavoured with hops. "The Reformation and hops in beer came in together." A similar coincidence will be noticed when we come to speak of English pottery.

As the Reformation spread throughout Germany, the Siegburg potters, though remaining Catholics, had no objection to making pots for Protestants. Now and then, the ecclesiastical rulers would come down heavily on too flagrant a case, and fine the offending potters 600 gulden or so. The trade came to an end soon after the commencement of the seventeenth century, on the breaking out of the disastrous Thirty Years' War between Catholics and Protestants, when the whole of Germany was repeatedly overrun by the contending forces.

From Ræren came a somewhat different style of

ware. The general colour is a warm brown, brightened only by the glistening lights on the sharply stamped or cut enrichments. There are some very handsome specimens at South Kensington Museum. One, a large jug, dated 1577, bears the arms of England, Brandenburg, Denmark, Orange, and Sweden, and the initials of the maker, B. M. Another of same date has quite a gallery of representations of the seven virtues and seven arts, and among its inscriptions are some which read, "Master Baldem Mennicken, potter, dwelling at Rorren. I submit to God's will. Patience under suffering." The last sentence seems to recur more than once, reading in Flemish, "In Leiden Gedolt," and unwary writers, translating Leiden into Leyden, began to attribute the manufacture to the university town of that name in Holland. The story of Susannah and the Elders is frequently found on the Ræren wares, and possibly had some local allusion to the strained relations between Catholic dignitaries and the struggling Protestant faith. Another type is found in the Greybeards or Bellarmine jugs—so called in doubtful honour of the famous Cardinal of that name, who died in 1621. A favourite form of decoration is a dance of peasants, frequently represented with great vigour and humour. One has this legend underneath—

"Let dogs bark,
Let bauers dance,
Or you get a cracked skull."

Another piece points a useful moral. In one panel we see a peasant who has been too long at his wine. His wife beats him with a broom, and underneath are his exclamations of distress. In the next panel he is shown being handed over to the neighbours, who buffet him, and underneath is the naïve inquiry, "Must it be so?" We next see him taken home, and he is shown blowing a horn while the good dame cooks the dinner. Underneath are the words, "It must come to this."

The manufacture at Ræren lingered on till 1806, when it ceased on the French taking away the old right of getting salt free from Westphalia.

Nearer Cologne, there was a seat of the stoneware industry at Frechen, to which place the potters of Cologne had been asked to retire in consequence of the numerous conflagrations caused by their kilns. From Frechen there came an abundance of the Bellarmine jugs, and other jugs of a similarly rotund shape, with moral sentiments moulded thereupon. Occasionally blue is used to heighten the designs.

From the Nassau potteries there came somewhat homely specimens, with incised designs coloured in blue or violet. A little barrel made here has the initials G. R., and portraits of the English William III. and Mary his Queen, with the legend (in Dutch), "In our Dutch garden thus flourish the orange, apple, and rose." Ware is still made here in the old style in a

quiet kind of way; but local enterprise extends to no further than copying the old patterns.

A different variety of stoneware emanated from Kreussen, in Bavaria, in which the dark-brown or chocolate colour of the ware is hidden by bright enamel colours and gold fired on afterwards. One kind of frequent occurrence, in which the moulded enrichments have been coloured in black and white, are called Trauerkrüge, or mourning-jugs; another very prevalent style is a mug with figures of the Apostles very brilliantly coloured.

The stoneware that we have been describing, and more especially the Bellarmine jug in its various (but not greatly varying) forms, was very largely exported to other countries. England seems to have been a large consumer; to France is due the name by which the ware is (not altogether accurately) now generally known—Grès de Flandres.

We broke the thread in our description of English mediæval pottery when mentioning the patterned tiles in various coloured glazes. These were for a long period the best development of pottery that England could show. The times were perhaps too disturbed for much encouragement of potters. Domestic utensils were mostly of wood or leather. In common with France, there was some use made of pitchers and heavy pots glazed in green or yellow lead glaze; many of these have a rude mask under the lip in the fashion

afterwards adopted for Bellarmines. Pilgrim bottles or costrels were also made in glazed wares; some are mottled in red and white, and suggest the "agate" wares produced long afterwards in Staffordshire. Considering that these wares were of rather fragile make, it is not surprising that examples are rare. One very grotesque jug, glazed in green, found in an excavation at Lewes, must date back to the reign of Edward I. It is in the form of a mounted knight; his beard and spurs indicate the period very definitely. A handle joins the knight's back to the back of the horse, and the contents were poured from the horse's mouth.

It seems to be true that we English were always a little behind as regards comfort in living, and we were still content with common green-glazed pottery when more highly finished wares were prevalent abroad. Even as late as 1663 Pepys records in his Diary that, being present at the Lord Mayor's dinner, he "sat at the merchant strangers' table, where ten good dishes to a mess, with plenty of wine of all sorts; but it was very unpleasing that we had no napkins nor change of trenchers, and drunk out of earthen pitchers and wooden dishes." The "trencher" was, of course, a wooden plate, and so called from the *trunche*, or slice of bread, on which the meat was placed by the master-carver. The *cruse*, *cruske*, or *cruskyn*, was a drinking-cup of earthenware, sometimes mounted in silver; the *crocke* (or *crouke* in Chaucer) was a larger jug; the

godet or *goddard*, a small bowl or cup; the *costrel* or *costeret* was, as already mentioned, a flask for travellers' use; the *jubbe* was a large jug; the *longbeard* was another name for the Bellarmine; the *tyg* was a drinking-cup, with two or more handles. Our word *tile* is derived from the Saxon *tygel*, and Tilewright or Tellwright is not an uncommon name in Staffordshire, thus recalling the antiquity of the pottery industry in that neighbourhood.

Of Elizabethan times are the stove tiles, moulded in German fashion, and glazed green, of which an example may be seen in the British Museum. It bears the initials E.R., and the large Tudor rose and arms of England and France, seem fairly conclusive of its royal use. As the Renaissance began to make its influence felt in English architecture, some instances occur of modelled and moulded terra-cotta enrichments for buildings; and the brick work of Tudor times, with or without such terra-cotta enrichments, often forms a very happy feature both for design and colour in our old town and country views. At Hampton Court Palace, the older part begun by Wolsey rejoices in some very rich chimney-pots, which group exceedingly well as they rise above the old red walls of the Privy Garden, and the effect of the great courtyards and gateways in brickwork of warm toned hues is very fine. Set in the walls of the gateway turrets are some red terra-cotta medallions with heads of Roman emper-

ors. There were ten of these ordered by Wolsey at £2, 6s. each of Joannes Maiano, an Italian sculptor, a letter from whom, dated the 18th of June, 1521, is preserved in the Record office, in which he asks for payment, and mentions that they were for the palace at Anton Cort. Under the clock tower is another terra-cotta ornament in the shape of Wolsey's coat of arms with date 1525—one of the few instances where the cognizance of the fallen cardinal was suffered to remain by Henry VIII.

It is worth noting in connection with Hampton Court, that it was the scene, some three years before Cardinal Wolsey's downfall, of some extremely magnificent festivities given in honour of the Constable Montmorency whom we have had occasion to mention in connection with Abaquesne and Palissy. At Sutton Place near Guildford, erected by Sir Richard Weston, Treasurer to Henry VIII., terra-cotta is freely used in details of windows, stringcourses, and copings, and at Layer Marney in Essex, a mansion was commenced about the same period by Lord Marney, in which it was intended that all the ornamental features should be in terra-cotta. The clay of which these are made is not to be found in the neighbourhood. Italian workmen are said to have been brought over for the work, but the details of the ornament are certainly not in very pure Italian—they betray rather a French feeling. In 1523 Lord Marney died, and his only son the year

after. The building operations came to an end, with only the great gateway and a portion of the house finished, and an elaborate terra-cotta tomb in the church close by.

Except for these instances, terra-cotta was not very largely used for architectural purposes in England, and it was reserved for this last generation or two to see a wonderful revival in this respect. Bricks and tiles, of course, continued to be largely made, especially when the growth of our towns, and the advent of Dutch William led to the erection of miles and miles of brick houses more or less in that style of the Dutch Renaissance we know as "Queen Anne" or "Georgian." While speaking of William III., it is interesting to note that one of his most strenuous apologists, Daniel Defoe, was in early life secretary or manager of a tilery at Tilbury employing some "hundred poor persons." The tiles were very possibly the flat red quarries for paving, such as were used at Tunbridge Wells, where the parade is still called the "Pantiles." Defoe afterwards drew upon his experiences at Tilbury in narrating how Robinson Crusoe attempted to make earthenware and subsequently to fire and glaze it.

Although most bookshelves contain a copy of Defoe's immortal romance, we shall make no apology for recalling the story of Crusoe's endeavours.

"It would make the reader pity me, or rather laugh at me, to tell how many awkward ways I took to raise

this paste; what odd, misshapen, ugly things I made; how many of them fell in, and how many fell out—the clay not being stiff enough to bear its own weight; how many cracked by the over-violent heat of the sun, being set out too hastily; and how many fell to pieces with only removing, as well before as after they were dried; and, in a word, how, after having laboured hard to find the clay—to dig it, to temper it, to bring it home, and work it—I could not make above two large earthen ugly things (I cannot call them jars) in about two months' labour. . . . Though I miscarried so much in my design for large pots, yet I made several smaller things with better success, such as little round pots, flat dishes, pitchers, and pipkins, and anything my hand turned to, and the heat of the sun baked them strangely hard. But all this would not answer my end, which was to get an earthen pot to hold what was liquid and bear the fire, which none of these could do. It happened after some time, making a pretty large fire for cooking my meat, when I went to put it out after I had done with it, I found a broken piece of one of my earthenware vessels in the fire, burnt as hard as a stone, and red as a tile. I was agreeably surprised to see it, and said to myself that certainly they might be made to burn whole if they would burn broken.

"This set me to study how to order my fire so as to make it burn me some pots. I had no notion of a kiln such as the potters burn in, or of glazing them with

lead, though I had some lead to do it with; but I placed three large pipkins and two or three pots in a pile, one upon another, and placed my firewood all round it, with a great heap of embers under them. I plied the fire with fresh fuel round the outside and upon the top till I saw the pots in the inside red-hot quite through, and observed that they did not crack at all. When I saw them clear red, I let them stand in that heat about five or six hours, till I found one of them, though it did not crack, did melt or run; for the sand which was mixed with the clay melted by the violence of the heat, and would have run into glass if I had gone on; so I slacked my fire gradually till the pots began to abate of the red colour, and watching them all night, that I might not let the fire abate too fast, in the morning I had three very good (I will not say handsome) pipkins and two other earthen pots as hard burnt as could be desired, with one of them perfectly glazed with the running of the sand.

"After this experiment, I need not say that I wanted no sort of earthenware for my use; but I must needs say, as to the shapes of them, they were very indifferent, as any one may suppose, when I had no way of making them but as the children make dirt pies, or as a woman would make pies that never learned to raise paste."

Of scarcely more advanced technique than Crusoe's fictitious pipkins, was the quaint "slip ware" actually

being produced about the time that Defoe was writing.

This homely-looking ware seems almost out of place in a museum; Thomas Toft's mermaid dish at South Kensington Museum looks almost ashamed at being seen in the company of Wedgwood and other masters; its yellow ground, red mermaid with white face and hands, the outlines drawn in a sticky-looking dark brown broken up with white spots, display almost too naïve a style of workmanship. The class of ware is, however, most distinctive and peculiarly English, and deserves attention. It was produced mainly in Staffordshire, Kent, Cheshire, and Derbyshire. In Kent, it seems to have originated only at Wrotham near Maidstone, the earliest known piece being dated 1612 and the latest 1710; it is very possible that the ware was made much earlier than the first date, and even now pieces made in the same way may be seen for sale in country markets.

The body is generally of red clay, and the ornaments are in white or coloured clays trickled on in a liquid state, or slip. Sometimes the whole piece is dipped in the white clay and the red slip trickled thereon; sometimes the two colours are marbled together. They are all glazed with lead which gives a warm colour, the white becoming yellow. Occasionally a piece is seen in which the coating of white clay is scratched through to form the pattern. A plate decorated in this way

with some spots of brown slip and the inscription "IE: WE 1699: WROT: HAM," is in the British Museum. It has been conjectured that the I.E may stand for a John Evelyn who owned the site; he was cousin to the celebrated diarist. In Staffordshire, some large dishes —evidently meant only for ornament—were made by Thomas and Ralph Toft, and their names are writ very large thereupon, not underneath, but boldly across the face. The mermaid dish at South Kensington Museum is by Thomas Toft. The fashion of including the maker's name among the ornaments was followed by other Staffordshire men; some of the names are William Talor, William Sans, George Taylor, John Wright, and Ralph Simpson. On a large three-handled posset pot in the British Museum is this inscription: it is typical of the loyalty and bad spelling of most of the pieces:—

"God bless the Queen and Prence Gorg^{e}. Drink and be mery and mary: B.B. John Meir made this cup 1708."

The figures on these pieces are grotesque to the last degree, especially as many are intended for portraits of monarchs and great personages.

Some romance may be connected with a three-handled jug to be seen in the British Museum, which has these words round it:—

"Ann Draper this cup I made for you and so no more
J. W. 1707."

Near it may also be seen a sort of triangular stand perhaps made for a flat-iron (Professor Church, however, thinks it may have formed part of a tombstone). It has on it:—

1695
E.E.
When this V C
Remember Mee.

Wall tablets and tombstones were often made in this glazed slip ware, and may still be seen in the Burslem and Wolstanton churchyards. The oldest bears the date 1718.

The wisdom of these simple potters is often displayed in such miscellaneous inscriptions as:—

"Be mery and wis(e)."
"Help Lord for Good and godly men do fail."
"Obeay the King."
"Drinke faire—Dont Sware."
"Brisk be to the Med you desier as her love you ma require."

One posset-cup has this fragmentary observation:—

"The best is not too."

It is evident that the worthy potter, beginning with his lettering a little too large, found on getting round the cup that there was not sufficient room to include the word "good," and therefore left it out.

A variation in the methods of decorating the slip-wares was obtained by "marbling" the slip-covering, or "combing" it by dragging over the wet surface a leather, wood, or metal comb. Pieces are found with

this forming the only decoration, or, combined with scrolls or lettering, put on in the usual trickled way. This combing was a rough way of getting an effect, afterwards carried to great perfection by Wheildon and Wedgwood, and called "agate" or "onyx" ware. In this the varied colouring was made to go right through the substance of the piece by beating together slices of different coloured clays, and pressing the mixed mass thus obtained into suitable moulds. From this it is an easy step to the "tortoise-shell" ware for which Wheildon was especially famous, in which the surface was flooded with a mottled blending of rich manganese-brown, copper-green, and cobalt-blue, floating in a rich lead glaze. Wheildon died in 1798, and his work extended, therefore, well into the modern period.

Returning a little in our history, we have to speak of English salt-glaze stoneware, which, as with the slip-ware, may be considered as an especially English development.

It is impossible to say when salt-glazing first made its appearance in England, and whether we can claim its origin, or if we have to give the honour to Germany. It used to be thought that the brothers Eler, who set up work at Burslem in 1688, having come over with William of Orange, were the first to use salt-glazing in England, but this idea must be given up, for before that time, about 1670, John Dwight was using the process at Fulham, and it seems extremely likely that

the Elizabethan jugs (similar in shape to the Bellarmines), of which large numbers are found in excavations in London, were made in London also. Their colour, the shapes, the character of the mottled glazed surface, are all unlike the Grès de Flandres; and, although it is known that the English were good customers for the German wares, it by no means follows that we did not make similar pots. At South Kensington Museum there are six mounted jugs of this kind, and the silver-plate marks are of the years 1560, 1565, 1576, 1580, 1590, 1600 respectively.

There used to be a tradition in Staffordshire, that salt-glazing was discovered about 1680 by accident, a servant, boiling brine, having permitted it to boil over, and the pot, becoming red-hot, thus was glazed with salt; the master—so ran the tale—expresses his surprise, the neighbours rush in, and at once are filled with the idea of glazing their wares with salt. Chemists have pointed out that the story is altogether unlikely, as the heat possible at an open fire would not be enough to volatilise the salt or vitrify the ware, both being essential conditions in true salt-glazing. The process was apparently not known in Staffordshire when the Elers first used it, for it is recorded that on the first occasion of "salting off," such volumes of smoke and flame came from their kiln as to excite the dismay of all the master-potters (then eight in number) in Burslem.

The first mention of stoneware in England occurs in 1581, in the petition of a certain William Simpson, merchant, for "full power and onelie license to provyde, transport, and bring into this realm the pottes made at Culloin (*i.e.*, Cologne), called *Drinking stone pottes*;" the business being alleged to be hitherto entirely in the hands of "one Garnet Tynes, a straunger living in Acon, in the parte beyond the seas, being none of her ma^ties^ subjecte." Simpson promised that should his petition be granted, he would, "as in him lieth, drawe the making of such like potte into some decayed town within this realm, wherebie manie a hundred poore men may be sett a work."

It is not known if this suit were granted, but in 1626, letters patent were taken out for Thomas Rous and Abraham Cullyn for "the sole making of the stone pottes, stone juggs, and stone bottells for the terme of fourteene yeares." They were to pay a yearly rent of five pounds, nor did they desire to hinder the importation of these commodities by others from foreign parts. Dwight's first patent is dated the 23rd of April, 1671, and his second, the 12th of June, 1684. Both have a similar preamble, the second commencing thus:—

"John Dwight, gentl/, hath represented unto us, that by his owne industry, and at his owne proper costs and charges, hee hath invented and sett up at Fulham, severall new manufactures of earthenwares, called by the names of white gorges, marbled porcellane

vessells, statues, and figures, and fine stone gorges and vessells, never before made in England or elsewhere; and alsoe discovered the mistery of transparent porcellane, and opacous, redd, and darke-coloured porcellane, or china and persian wares, and the mistery of the Cologne or stone wares, and is endeavouring to settle manufactures of all the said wares within this our kingdome of England; and hee having humbly besought us to grant unto him our Letters Patents for the sole use and exercise of the same for the terme of fourteene years, wee are gratiously pleased to condescend to that his request," etc., etc.

Of the allusion here to "porcellane," we must speak later when dealing more particularly with that subject. Of his stoneware several fine examples are known which make it quite clear that both artistically and technically, Dwight had very little to learn. His busts especially are wonderful examples of stoneware; the portrait of Prince Rupert in the British Museum is most excellently modelled, and the ware of a dark brown colour appears to be perfect. A little statuette at South Kensington Museum of a girl with a skull at her feet, and another half-length of a dead child clasping some flowers to her breast, are pathetic memorials to Dwight's daughter Lydia, who died at the age of fifteen. In a cellar belonging to the old Fulham works there were found, not many years ago, a large number of Bellarmine jugs, differing in hardly any respect from the

German ware. How far, however, Dwight made them as a commercial success is not known; from a rough memorandum book of his (now in the possession of Mr. Bailey, who still carries on a stoneware pottery on the old site), Dwight was apparently very well off, for it contains numerous entries of the various places where he had hidden his guineas, evidently preferring to be his own banker.

John Dwight had graduated as M.A. at Oxford, and appears to have been a man of considerable learning. That his attainments in pottery were fairly well known at the time is evident from several references to him and his use of clays and other materials. Dr. Plot, in his "History of Oxfordshire" (1677), mentions that Dwight was making the Cologne wares such as d'Alva bottles, jugs, and noggins to such perfection that the company of glass-sellers of London had contracted with him to buy only his, and refuse the foreign make for which heretofore they had been agents.

The Elers introduced an ideal of pottery manufacture into Staffordshire that had before their time hardly been dreamed of. They washed their clay and prepared it with extreme care, and used the turning-lathe in order to obtain finer and thinner shapes than could be got by throwing. Although it is probable that other wares were made by them, only a bright red ware can be definitely attributed to them; it is very like a Chinese red ware that used to be greatly admired,

known as "boccaro" ware, and has sharply stamped enrichments (said to be from metal moulds) in the Chinese style. The Elers did not sign their pieces. Their works were situated at Bradwell in a lonely spot, where they had found a supply of fine ferruginous clay. Every operation was conducted with the greatest secrecy, and only rough labourers or half-witted persons were employed. The finished pieces were conveyed stealthily to a distant cottage for sale, and there was a warehouse in the Poultry, London, kept by David Elers, at which the teapots could be had at from twelve to twenty-five shillings each. No pieces of very large size seem to have been made.

Their secret was soon found out. A man named Astbury, feigning idiocy, succeeded in obtaining employment at Bradwell, and after learning all he could, set up in business for himself at Shelton. He, however, did not content himself with what he had learnt, but began to use other mixtures of clays, obtaining in addition to the red, a fawn, orange, and chocolate colour. His ornamental work was stamped in Devon or pipe-clay, and he often used a lining of white clay for the insides of his wares. About 1720 he began to use ground flint mixed with the clay to lessen the shrinkage. A bowl of red clay decorated with ships in white clay may be seen in the British Museum. It is dated 1739 and commemorates the "Porto Bello."

Astbury's son, Thomas, commenced business in 1725,

and was specially known for his "cream colour" body, a colour afterwards much used by Wedgwood. To this Astbury is sometimes attributed the first use of flint in pottery. Wedgwood's statement in a letter to Bentley does not quite agree with this. He says:—

"The white stoneware was produced by using the white pipe-clay instead of the common clay of this neighbourhood, and mixing it with flint stones calcined and reduced by pounding into a fine powder. The use of flint in our pottery is said to have proceeded from an accident happening to one of our potters, a Mr. Heath of Shelton, on his way to London. His horse's eyes becoming bad, he applied to an hostler on the road, who told him he would cure the horse and show him what means he used. Accordingly he took a piece of black flint stone and put it into the fire, which to our potter's great astonishment, came out of the fire a most beautiful white, and at the same time struck him with an idea that this fine material might improve the stoneware lately introduced among them. He brought some of the stones home with him, mixed them with pipe-clay, and made the first *white flint stoneware*."

It is quite clear, however, that Dwight had used flint long before either Astbury or Heath, for in his memorandum books of recipes, written at intervals from 1692 to 1698, among many interesting items is one: "Calcined, beaten, and sifted flints will doe instead of the white sand and rather whiter, but the charge and trouble is more."

The Elers gave up business about 1710, having made by no means a fortune. But the improved methods introduced by them were of the greatest importance to the welfare of the Staffordshire industry. The salt-glazed wares—at first called *Crouch* wares—up to about 1720 are of somewhat rough production, but with the use of flint, some wonderfully sharp and light work was made. Metal or baked clay moulds were used for casting the shapes, the model having, of course, been first carved in alabaster or other suitable material. Sometimes the whole form was moulded; a teapot in the shape of a house is one favourite form; another is a heart-shape teapot; tea-caddies, sweetmeat-trays, sauce-boats are other forms. When used in circular shapes, the throwing and lathing have been done most expertly; the objects are as thin and light as possible, sometimes almost as translucent as porcelain. The ware was fired in saggers through which a few holes allowed the salt vapours to pass. About 1750, plaster of Paris (Ralph Daniel having seen it in use in the Paris potteries) began to be used for the moulds, and a consequent lack of sharpness is discernible in the wares produced. Finally, about 1780, the production ceased, having been killed by more showy productions and the more perfect surface secured by the lead-glazed "Queen's ware."

Very few white salt-glazed pieces are marked. The younger Astbury, Twyford, Billing, Shaw, Thomas

Wedgwood, and Turner are a few names of makers. In the South Kensington Museum are preserved some moulds; among them is one for a small milk-jug, and on the bare spaces where the feet would afterwards be placed are the initials R. W. These were probably carved there by Ralph Wood, a mould cutter of Burslem, and father of Aaron Wood, who, later on, made salt-glazed ware for himself, and cut moulds for Thomas Wedgwood, Wheildon, and others.

Where the surfaces were plain, a very usual method of decoration was by incising lines by hand, and blue was then painted into the lines and cleaned off along the edges. One large mug inscribed in this style may be seen at South Kensington Museum. It reads:—

"This is Thomas Cox'es cup: Come my Freind and
Drink it up.
Good news is come'n, the Bells do Ring: & here's a
Health to Prusia's King.
February 16th 1758."

Some pieces covered all over with a deep blue glaze and black and white enamelled ornaments, were made about 1750 by William Littler of Longton. Other pieces in blue are decorated in gold lines fired on; other gold patterns are found on white ware in the incised lines that might otherwise have been painted with blue.

A class of salt-glaze stoneware that has by no means as much interest as the others, is that in which coloured enamels were used to imitate Chinese or

Delft patterns. But the colouring is sour and unpleasant, and the quaint old-fashioned spirit of the earlier wares has departed. Effects of colour could be obtained better in china ware, and we do not see much of the enamelled salt-glaze.

Staffordshire was not the only centre, outside London, of stoneware-making. At Nottingham there was a considerable manufacture carried on throughout the eighteenth century. The wares have a bright brown colour, and a very smooth glaze. Some of the pieces have a kind of maidenhair pattern cut through the glaze. A curious fancy obtained at Nottingham for the making of "bear" mugs in the form of a sitting bear, the head lifting off to form a cup for drinking from ; the body of the bear is generally powdered over thickly with small fragments of clay stuck on while the body was wet.

The bear mug seems also to have been made at Fulham, where, after Dwight's death, the business was still carried on. Dwight had buried all his moulds and recipe books in order that his descendants might not waste their time and money in following out his experiments, and nothing but common brown jugs and mugs then were made. A characteristic design in relief of huntsmen and dogs dates from about this time, and has been repeated again and again ever since, being still made in large numbers by the London stoneware potters. Figures adapted from Hogarth's "Midnight

Conversation," the head of Queen Anne, and St. George and Dragon frequently occur. "The pious Memmory of good Queen Anne" seems a favourite inscription. In one case it is "Memomery," in another "pyouse." On some of the mugs the potter seems to have gathered together all his moulds, and Queen Anne, a church, trees (one with the head of King Charles in the oak), halberdiers, and dogs are all mixed together. One particular hunting incident seems to have been thought very remarkable; its description occurs several times with but slight variations (except those due to spelling):—

"On Banse (*i.e.* Banstead) downs a hair (hare) wee found
Whatt led uss all a Smoaking Round."

We have already mentioned Defoe's "Robinson Crusoe;" here we may mention a piece with a strange connection with the real Robinson Crusoe. The descendants of Alexander Selkirk for a long time preserved a flip-can that had been made at Fulham in 1703, and incised with these words:—

"Alexander Selkirke. This is my one
When you take me on bord of ship
Pray fill me full with punch or flipp
Fulham."

Brown stoneware similar to that of Fulham was also made at Lambeth, and it is thought that workmen from Fulham may have started the manufacture. The earliest dated piece of Lambeth stoneware is of the

year 1761. Only jugs and mugs in this ware seem to have been made.

Lambeth is much better known as the seat of several manufactories of Delft ware, which seem to have been in operation even before the date of a patent granted in 1676 to John Ariens van Hamme, a Dutch potter, who settled at Lambeth, and started works for "the makeinge tiles and porcelane and other earthenwares, after the way practised in Holland."

We must not speak of English Delft, however, before dealing with the original Dutch ware, nor of the Dutch productions until we have traced back to its source the Oriental porcelain that served as model, not only to the Dutch potters, but to the Italian, French, German, Spanish, and English—for indeed, in all countries, ever since porcelain came to Europe, there were continual efforts to imitate it, and solve the mysteries of its production.

CHAPTER IV.

ORIENTAL PORCELAIN AND POTTERY, AND THEIR EUROPEAN IMITATIONS.

"THE mistery of transparent porcellane"! These words of John Dwight's are significant of the way in which the wonderful wares from China were regarded during many centuries. Collected by the wealthy, gazed at with envy by the mediæval potter, continually being imitated in rough wares that would never acquire the needful translucence and glossy surface, porcelain remained a mystery, and the secret of its production was sought for as eagerly as the philosopher's stone in earlier times.

As far back as 1170 it is recorded that Saladin sent forty pieces of Chinese porcelain as presents to Nur-ed-din. In the next century, Marco Polo, the great traveller, visited China and saw a porcelain factory. In 1487 the Sultan of Egypt sent a present of porcelain

to Lorenzo the Magnificent. The earliest pieces known to have been brought to England were some blue and white bowls given by Philip of Austria to Sir Thomas Trenchard in 1506, and there is at New College, Oxford, a bowl of Archbishop Warham's (1530) which is a piece of Chinese celadon ware. As to the designation *porcelain*, historians cannot quite agree ; the word seems to have become attached to the ware in a very roundabout way ; *pourcelaine* occurs in French inventories as early as 1360, and is thought to refer to mother-of-pearl ; *porcella*, or little pig, was the name of the cowrie shell, and *porcellana* was the name given by the Portuguese to the new ware, because of its shell-like glossiness. Great were the speculations as to its nature. Lord Bacon had an idea that "porcelain is a kind of plaster buried in the earth, and, by length of time, congealed and glazed into that fine substance." A similar idea prevailed abroad ; a learned Italian, Guido Pancirolli, wrote in 1617 that porcelain was a mass composed of plaster, eggs, and scales of marine locusts, worked together and hidden underground for eighty years. Whoever buried it could never use it himself, but his heirs would find it as a rich treasure, and vessels made from it would break immediately should poison be placed in them. Dr. Johnson derived porcelain from *pour cent années*, because the materials had to be buried for one hundred years.

Although our lexicographer was wrong here, he was

nearer the truth than he imagined. For we know now that porcelain can only be made with the products that were slowly formed, centuries long ago, from the decomposition of felspathic rocks. It is more a matter of geology than science, and until the European potters were put into possession of the only possible materials for making porcelain, they were sure not to succeed in their endeavours. In the attempt, however, many most valuable discoveries were made, and, as we shall see, even where porcelain did not result, many a beautiful faïence came into being.

In China itself the ware is called *Tse-ki*, and the materials for its production are generally spoken of by their Chinese names, *Kaolin* (or our china clay), and *Petuntze* (our Cornish granite or china stone). The Chinese records state that the ware was made in the reign of the mythical Emperor Hwang-ti (about 2690 B.C.) If this is too early to be credible, it is generally conceded that a green porcelain was made under the Han dynasty (202 B.C.–A.D. 220), and that wares were being made at King-te-chin, near Canton, in A.D. 580. This town had always remained the chief seat of the porcelain manufacture until its almost entire destruction in the Taeping rebellion, in the suppression of which "Chinese Gordon" was engaged. Last century the English Ambassador, visiting the place, said there were 3000 furnaces, and at night the town presented the appearance of being on fire.

Porcelain has apparently always been held in honour in China, and certain classes of wares are reserved for the Emperor and great dignitaries. The colours proper to the different dynasties are found to be especially prominent on the wares made during those dynasties; thus, the Sui dynasty reigning from A.D. 581 to 618, took green for the Imperial colour; Thang dynasty (618–907), white; Tcheou (about 950), blue; Ming (1368–1643), green; Tai-Tsing (commencing 1644), yellow. Of these, the Ming period is the one that had the most obvious influence upon porcelain, and pieces decorated with what is called the "green family" are most abundant. In these, the designs are drawn and partly coloured in under glaze blue, but the larger part of the remaining colouring is in a copper-green enamel, with slight touches of red and other colours. In some belonging to the same period, a black enamel is used to cover the whole ground of the vase, throwing into strong relief the characteristic design of white plum-blossom.

CHINESE VASE. GREEN FAMILY.

Notwithstanding the altered imperial colour, Kang-he, the second emperor of the Tai-Tsing dynasty, still carried on the "green" traditions, and gave out many choice pieces of "Ming" work for emulation and copying; sometimes so faithfully were they copied that the old dates were reproduced, to the bewilderment afterwards of collectors.

The peculiar tint of blue adopted by the Tcheou dynasty is a soft clouded tint, and resembles the "blue of the sky after rain," having been thus named by the Emperor Chi-tsong in 954. So highly was this colour esteemed, that even fragments of the ware decorated with it were esteemed as valuable as precious stones, when in 1369 a factory was started at King-te-chin in order to produce wares decorated in blue. Blue at all times seems to have been most highly esteemed by the Chinese; and they dignify the ancient blue and white wares by the name of *kouan-ki* (or magistrate's pieces —*i.e.*, vases which no one under the rank of an official ought to possess).

The blue and white "Nankin" ware of which so much came to Europe, is a comparatively modern style, not being older than the 16th century, a date when the Chinese began to import cobalt. Their native cobalt gave blues of somewhat softer tone. Copper gave other tints of blue, turquoise, lapis-lazuli, and the deep mazarine.

In most classifications of Chinese porcelain, one meets

with mention of the "Rose family," in addition to the "Green." This had no especial dynastic significance. The pale rose colour obtained from a certain preparation of gold (according to Jacquemart, the "purple of Cassius") was gradually introduced into the decorations of late "Green" pieces, and then used as the predominant colour, particularly in the reigns of Yung-ching (1723–36) and Kien-lung (1736–95). It is found in great perfection on pieces made so thinly as to be called "egg-shell" ware; some plates have the rose colour painted on the back, so that it shows through as a delicate shell-pink.

When using plain or "flowed" colours without any other decoration, the Chinese potters were invariably successful. Some of the colours they obtained have never been equalled by other makers, although attempted again and again, such as:—*sang de bœuf*, a mottled purple; *fleur de pêche*, mottled red and grey; apple-green, myrtle-green, camellia-green, lavender-blue, plum colour, and many other simple or blended colours of great beauty. Some of the clouded colours called *soufflé* were obtained by blowing through a tube covered with gauze; the spots of pigment falling upon the ground of another colour sometimes spread into little circles, or melted into the ground. The Chinese have produced with great mastery the *flambé* or flashed glazes; the method of firing is similar to the lustred majolicas of Europe, the reducing atmosphere caused in

the kiln by smoke suddenly introduced bringing about very startling changes of colour. Some of the pieces

VASE OF FLASHED PORCELAIN, REPRESENTING A GROUP OF LING-TCHY.

painted with copper red or "haricot" have flashed under the influence of more or less oxygen from fawn

to a beautiful green, pale blue, or violet, the colour in places burning away to nothing at all, exposing the white of the body.

Although so entirely successful with effects of colour, the Chinese have excelled in pure white ware. In this, everything depends on beauty of workmanship and form, and on different fanciful ways of perforating, carving, and building up the pieces. One very delicate effect is known as "grains of rice" work, the designs being cut through the thin substance in numerous small holes which have been subsequently filled up again by the pure transparent glaze over the whole.

Earthenware and stoneware also occur in Chinese art, but are not of such relative importance. The early celadon porcelain is almost a stoneware; the body is very hard and opaque, occurring principally in a soft sea-green colour (that is the tint we usually mean by the word celadon), but there were celadons of other colours. Earthenware seems to have been reserved for domestic wares. The stonewares have a dense, hard texture; the colour, generally reddish-brown, is found in the wares known since the Portuguese brought them to Europe, as *boccaro*. This is the "opacous, redd, and darke-coloured porcellane" of John Dwight's patent, and that which was successfully imitated by the Elers. It was sometimes decorated in enamels. Some very old pieces of a greyish-yellow colour were fabulously valuable and reserved for special ceremonies. A decor-

ated earthenware, sometimes of almost a stoneware nature, is covered with a felspathic glaze and decorated with enamel colours. A good deal of it finds its way to Europe in vases, garden seats, flower-pots, etc. Of this ware the famous porcelain tower of Nankin (destroyed by the Taeping rebels) was built; its bricks were enamelled in red, white, blue, brown, and green. Representations of it are fairly well known; with its numerous stories hung with bells and porcelain lamps it rose to a height of 263 feet. Some of the bricks may be seen in the British Museum.

We have left to the last any mention of the strange fancy of the Chinese for "crackle" decoration, in which the surface is covered all over with a minute irregular veining of cracks. They have, since remote times, made a most artistic use of what any other potters would have considered a defect, a defect that too often comes without any seeking on faïence, where the body and glaze are more liable to indulge in different degrees of contraction. But in porcelain, where the body and glaze are of the same chemical nature, this crazing or "crackle" does not occur of itself, and the ingenious Chinese with a kind of perverted taste have invented various ways of bringing about the defect. By one method, they mix powdered steatite with the glaze in order to interfere with its regular contraction; or by another, they expose the glazed piece to the sun, and then plunge it into cold water for a moment. However

obtained, the crackle is obtained with wonderful certainty. It may be of either a large, medium, or tiny figure (experts call the latter crackle *truité* or trout-scale). The cracks are filled in with colours, varied or plain; on some pieces there are different kinds of crackle found together, or certain parts of the design are stopped out so that the crackle stops short of them, or there are alternating bands of plain coloured glaze and of crackled white glaze. Sometimes the crackle is left uncoloured and is then only just discernible under a strong light; at other times the black, red, purple, or coffee-colour rubbed in makes the pattern very conspicuous. One very delicate crackle effect is the dead leaf (*feuille morte*) with its minute lines of golden yellow brown. Another old ware of pale blue with a rice-coloured crackle was named after the Tchang family of potters who produced it.

It would be impossible to speak here of the ideas conveyed by Chinese ornamentation. For one thing, the subject is one that is still open to much speculation, and even experts will place different interpretations upon the symbolic forms that recur. Almost everything in China is symbolic of something else; the shapes even, the colours used, the geometrical forms of circles, squares, oblongs, all mean something. Thus, the "honourable male principle," the sun, fire, and all phenomena of high moral import, are symbolised by the circle, ovals, and unequal divisions; but the inferior

female principle, the moon, and the earth, have to be contentedly represented by squares, rectangles, and equal divisions. Certain mythical dragons are appropriated to decorate pieces intended for the high and mighty, and dreadful penalties await those who are presumptuous enough to possess them, not being fully entitled to. The five-clawed dragon is for the emperor alone; a dragon of four claws may be used by princes. It is therefore evident that to read the complete story of a piece of Chinese porcelain, one ought to be familiar with the Chinese ways of thought. Needless to say, however, we all have not the necessary leisure to study very deeply the 5020 volumes of the great Chinese Encyclopedia in the British Museum, and must, in the absence of such knowledge, be satisfied with appreciating the technical excellence and perfect art which the potters of Cathay display in their incomparable porcelain.

Very few names of artists detach themselves from the vast mass of undistinguished Chinese work; and as Chinese names do not, we fear, convey much meaning to the ordinary reader, we need not mention them. It is scarcely possible to discern any individuality in the decorations; they group themselves into periods, and personal touches are altogether lacking. The pieces were made in such and such a cycle, under such and such an emperor—and that is all.

Japanese art has always, on the contrary, shown

much individuality; and in their best works in pottery, the impress of the individual artist is often very evident. The decorator's names frequently occur, far different in this respect from Chinese work, where each piece passed through so many hands that no one artist could claim it specially as his own. Less bound by tradition, more honoured as artists, and always closer students of nature, the Japanese artists cover a wider range of subject, and display far greater varieties of treatment than the Chinese workers ever allowed themselves (or were allowed) to indulge in. Acquiring the most remarkable technical skill, the Japanese have outstripped the Chinese in ingenious productions in faïence and stonewares; only in the old porcelain are they said to admit the superiority of the older nation.

The Japanese historians do not claim for their pottery an antiquity as great as the Chinese, nor do they disguise the fact that the art was learnt in China, and in the peninsula of Corea, an intermediate kingdom, in which the making of pottery has long ago ceased. There is a legendary story, that at a date corresponding to our 27 B.C., there lived in the province of Idsoumi, an athlete named Nomino-Soukouné, who made models of human figures, and prevailed upon the emperor of that time to allow these images to be buried with the dead instead of living slaves, as had been the custom, and that this shrewd image-maker was authorised to take the surname of Fazi, or artist. A

more important event than this, however, came about in the seventh century, when a Buddhist priest, named Guyoki, of Corean descent, invented, or more probably introduced, the potter's wheel. Two centuries later, pottery was being made in two provinces, Idsoumi and Kavatsi, and tiles and bricks were being spoken of.

It is not till 1225 that we read of any definite improvement. Then it was that Kato-shirozayemon (known also as Kadoshiro or Tôshiro), a potter who had been making little tea jars that did not entirely satisfy him, went to China to see what more he could learn. Returning, he settled at Seto, in the province of Owari, and from local clays made a kind of stoneware, called *shaki*, while, from materials he brought over from China, he made some sort of porcelain. Some of his pieces are still preserved, and are very valuable. His descendants, after the lapse of six centuries, even now are potters, and produce many fine works. Since 1800 they have made porcelain; one of the family, Kato-Tamikichi, having spent five years at Arita in order to learn the Hizen processes. He was unable to get any precise information upon these until he hit upon the notion of marrying the widow of one of the Arita potters. In England we can point in many families to several generations of potters; but we cannot, probably, bring forward anything to compare with this six (nearly seven) centuries of potting in one family!

From Seto having so early been the seat of pottery

manufacture, the name of *seto-mono* is applied to crockery generally. The blue and white porcelain generally, is called *sometsuke;* that made at Seto is, by many critics, thought to be superior to any other of Japanese production. Some of the finest pieces are never seen in Europe, as the Japanese are now alive to the value of their works of art. There were shown at Philadelphia Exhibition some specimens of Seto porcelain of extraordinary dimensions, vases six feet high, and a table-top six feet in diameter, triumphs of skill.

The original seat of porcelain making with native materials in Japan, was in the province of Hizen, and its foundation was due to Gorodayu Shonsui, a native of Isé, who went to China about 1530 to learn its methods, and on returning, finding suitable kaolin and petuntze in the hill of Idsoumi-yama, settled at Arita, and began to make all kinds of ware—blue underglaze, crackle, celadon, and red. Some sixty years after this, a Corean potter also came to the same hill, and began to make porcelain. From this province of Hizen, and principally from the town of Arita, the wares being commonly known as *Imari* (from the port of shipment) there have come in large quantities the ordinary blue and white that every one knows. From here, through the port of Nagasaki, came the *old Japan* porcelain, brought to Europe in ship-loads by Dutch traders; much of it was in imitation of Chinese work,

and, as such, served as patterns for the Delft potters, of whom we shall have something to say. The Portuguese were the earliest to trade with Japan, having, it is said, been able to obtain a footing in the year 1534; but their too anxious efforts to convert the natives, and some unfortunate intrigues against the Shogun, led to their dreadful and summary expulsion in 1641, after several massacres of thousands of Christian converts had taken place. Intercourse with foreigners was then forbidden under pain of death, and a high reward was offered for every Christian priest discovered. However, notwithstanding this extremely strict law, the Dutch managed, a very few years after, to obtain permission to place a trading station on the island of Desima, near Nagasaki, and, not interfering at all in religious matters, were surreptitiously able to acquire the coveted Hizen porcelain, although, once and again, the authorities would wake up, and some offending potter or merchant be compelled to expiate his unpatriotic conduct by committing *hari-kari*. The Dutch trade assumed vast proportions. In 1664 as many as 44,943 pieces of Japanese porcelain arrived in Holland, with half as much again in other wares, collected from Batavia.

Japanese porcelain is less hard than Chinese, and of a purer white; the blues are rather less transparent, owing to the difference in the native ores of cobalt. Blue and white wares are made at Kioto, in addition

to the places already mentioned, but the district is better known for its faïence.

A distinctive class of porcelain is that made in the province of Kanga or Kaga, and is conspicuous in its lavish use of red and gold. Some of the older work employs the most minute execution; crowds of figures are seen, with faces and garments finished to a painful degree. This particular manufacture was started about 1650, at Kutani, by some Corean potters who had been brought over by Godo Saijoro.

With the mention of one other style of porcelain—the extremely thin ("egg-shell") wares of Osaka, in the province of Setsou—wares so thin as to need the protection of fine wicker-work coverings, we may turn to Japanese faïence and stoneware.

The introduction into Japan, at an early period, of tea drinking, led to the institution of several peculiar ceremonial functions connected with the Cha-no-yu, or tea parties; and a prominent place in these is taken by the little tea-caddies, or jars, of old undecorated stoneware. These, apparently, are prized most extravagantly by the Japanese; preserved in silk bags, as they are, and laid away most carefully in cabinets, one expects to see something more choice. Perhaps to admire these simple little pots comes naturally to a people in whom the sense of the incongruous is highly developed, and the play-instinct allowed full scope. Some collectors of these tea-jars make too much of

the *itoguiri* mark on the base; this is a set of con-

MANDARIN JAR, WITH GOLD FILIGREE GROUND. JAPANESE.

centric lines, and is simply caused by the wire with

which the jar was severed from the thrower's wheel. Some of the tea-jars are in a black earthenware, lead glazed, called raku ware; it was first made in the sixteenth century by a Corean named Ameya, who had settled in Kioto. He was honoured by the Shogun, who gave him a gold seal, with which the wares were stamped for many years. The word "raku" (enjoyment) was engraved upon the seal — hence the name of the ware. The descendants of this potter, now known as Yeiraku, still carry on the profession of potters; the present representative is of the thirteenth or fourteenth generation.

At Bizen, pottery has been made from very remote times. It is chiefly of red stoneware, very hard and glazed.

The old wares of Satsuma were of a kind of grey stoneware, but the province is now known chiefly for its faïence, in which a fine pipe-clay is covered with a thick yellow glaze having an infinity of minute cracks. The ware is soft and fragile; its manufacture dates from about 1592, when, as with so many of the Japanese fabriques, some Corean potters came over and settled at Nawashirogawa. Large quantities of similar wares but, if anything, softer still, are made at Awata, in the province of Kioto, and this is often sold as Satsuma. The names of Ninsei, who lived about 1650, and of Kenzan, about 1750, are associated with Kioto faïences, several valuable pieces bearing their names.

The thin unglazed ware known as Banko is of quite

recent date, having been started about 1840 by a potter who assumed that name. The clay (either brown or white) is of remarkable toughness, and the objects can be made of extreme thinness. Some of the pieces are decorated with opaque enamels. With these and other tinted clays, shapes are now moulded with the mixed clays, producing mottled or marbled effects throughout their substance (similar to our English "Agate" ware); the method in Japan is known as Mokume.

The ingenious Japanese sometimes apply lacquer to porcelain, but this can hardly be considered as true porcelain decoration. If the body of the vase is to be disguised, it might just as well be of some other substance than clay. Nor can the cloisonné enamels on faïence be accepted as in better taste; the method is essentially one adapted for metals, and successful results can be obtained more easily on metal than on soft baked biscuit, to say nothing of the permanence of the work.

Of the elements constituting Japanese art, it is hardly necessary to speak here. Less conventional than Chinese, less bound by tradition, the Japanese artists display a delightful freshness of idea that has appealed very strongly to, and greatly influenced our Western designers. Although the ignorant plagiarisms and hideous eccentricities that passed muster ten or twenty years ago as Anglo-Japanese design (!) might

almost have imperilled our reputation as a people of taste, and the now nearly extinct plague of cheap Japanese wares might have definitely killed any remaining art perception, yet sanity on these points is gradually being restored; we are awaking to the fact that not everything Japanese is good in point of design, and that mere strangeness and eccentricity are not the essence of Japanese art. If we are able to discern the intimate knowledge of nature, the analytic eye, and the admirable sense of reticence and balance that distinguish the best Japanese work, it will have fulfilled its mission. The absurd phrase of "living up to one's teapot"—one of the literary missiles that were aimed some few years ago at the Æsthetic movement, was not so absurd after all. It would be a good thing for our native arts if our designers could live up to the standard of good Japanese work, and look at Nature for themselves.

Of the numerous faïences that are now made in India we do not propose to write in detail. Many of them are of modern origin, and have not been altogether uninfluenced—sometimes harmfully—by contact with European ideas. It is now the endeavour of the directors of some of the Indian schools of art to revive the purer native taste, and to let the traditional handicrafts pursue their unhampered way.

Persian ideas rule strongly in most Indian ceramic ornament. Sometimes overwhelmed by a riotous flood

of exuberant details, Indian work has not any great pretensions to technical perfection. A good deal of it is pure village work, carried out with primitive implements and materials, and yet with very admirable decorative effect. Wood of different kinds is used for fuel, and the potters of the old school are particular in the choice of a correctly auspicious day for the burning. The wares from Sind are made of a body of red earthenware, sometimes coated entirely with white slip or almost covered with slip-patterns which show through the rich-coloured glazes (often iridescent) of green, yellow, brown, or turquoise blue. Mooltan pottery is a red or yellow earthenware with thick slip work, painted, as a rule, in turquoise and deep blue. The siliceous body of the Delhi pottery with its thin soda glaze introduces a style of decoration quite Persian in effect. A purely Indian ware is of black earthenware highly polished and gilded. Another black ware made at Azimghar has decorations with the effect of silver, obtained by rubbing tin into the etched lines. From Madura comes a characteristic ware glazed in green or brown, generally in form of water-bottles, with a double body, the outer one being perforated in patterns.

Of all the early history of Indian pottery there is no certain information. Contiguous to Persia, its ancient buildings were faced with glazed bricks and tiles in styles, no doubt, suggested by Persian work, if not carried out by Persian workmen. On the conquest of

Persia by the Mohammedans about 650, large numbers of its inhabitants migrated to India as Parsees, and it is not at all unlikely that with them went many a pottery secret.

No porcelain is now made in India. A few rare porcelains with decorations in Indian styles seem to point to their production in India, but on this point there is no unanimity of opinion among experts, and some are prepared to say that the pieces must have been made in China to Indian designs.

The porcelains brought to Europe by the Portuguese and Dutch traders extorted, as we have said, great admiration, and many were the attempts to imitate the ware. It was not until many years had elapsed that it seems to have become evident how futile would be all endeavours until similar materials to those used by the Oriental workmen could be found. At last it became possible to obtain some of the actual materials from China, but, of course, only by favour, and at great expense. Finally, during the eighteenth century, deposits of the true kaolin and petuntze were found at different places in Germany, France, and England (though this latter discovery had not taken place until its possibility had been suggested by the arrival of a consignment of the materials from Virginia). With these abundant supplies, the true *hard* porcelain was at last attempted with technical success. All other artificial compositions designed in imitation were

known as *soft* porcelain, and it will be important to bear this distinction in mind. Earthenwares with a tin enamel and decorated in styles copied from or

A VIEW IN DELFT.

suggested by the Chinese work made a third group, one that precedes in point of time the others, and which we shall therefore deal with first.

Among these, the earthenwares produced at Delft

have given their name to the whole class, whether coming from Holland or England, the manufacture in this country having been started by Dutch potters. There had been as early as the fourteenth century a pottery at Delft, but on the opening of trade with the East, a complete change of method took place. The tin enamel in use in Italy gave a means of distantly imitating the white body of the china, and nothing was easier than to copy the Chinese figures and ornament. In 1614, Claes Janssen Wytmans was authorised by the States-General of Holland to make "all kinds of porcelains, decorated and not decorated, very nearly conformable to the porcelains which came from distant countries." Of course, the ware was not porcelain, but only a fine faïence. The clay came mostly from Tournay, and the tin from England. The enamel is bluish in tone, and of even surface. The shapes and decorations when departing from Eastern models had a tendency to become grotesque, arriving at last at the enormity of a pottery fiddle. Most of the potters belonged to a Guild of St. Luke; the "Masterbook" (with entries from 1611 to 1715) of this Guild—one of the treasures in the library at the Hague—records their elections and particulars of the tests to be undergone by a painter (*plateelschilder*) or thrower (*plateeldrayer*). The latter, in a locked room and watched by two deacons, had to throw a ewer, syrup-pot, salad-bowl, and a salt-cellar with a hollow

foot out of a single piece of clay, and if he failed, had to go back to his apprenticeship—already lasting six years—and serve for another year and six weeks before again coming forward for examination. The first potter, whose name is recorded in this register, is Gerrit Hermans, 1614, a son of one of the original founders of the Guild. Each master-potter had to register his mark, and there was a fine of 600 florins for any one counterfeiting another man's mark. Some of the decorators were famous for Renaissance subjects, Gerrit Hermans usually depicting battles and historical scenes crowded with figures. Abraham de Kooze (elected 1632) painted landscapes; Albrecht de Keizer (1642), garden scenes and cupids; Arij Jan de Milde (1658) was famous for red ware teapots, anticipating in this respect the Elers of forty years later. At one period there were thirty different manufactories at

OIL CRUET—DELFT WARE.

Delft, and the list of their signs reads quaintly—such as the "Peacock," the "Metal Pot," the "Three Barrels," the "Porcelain Hatchet," the "Gilded Boat." The manufacture ceased early this century, but has been revived quite recently. Similar wares were made last century at Amsterdam, Arnheim, Rotterdam, Utrecht, and Brussels.

The English delft ware was sometimes nearer in colour to porcelain than its Dutch original; our English clay burnt harder, and the tin enamel not being absorbed so much, was more opaque and whiter, almost tending to pink. The blue on Lambeth delft is paler and greyer than on that made at Bristol and Liverpool; the Staffordshire ware seems to have been poorer in quality, with enamel of yellowish tone. Although some ornamental pieces were made (the ornament and figures very poorly done), most of the delft was for use as dishes, cups, drug pots, pill-slabs, and, very specially, wine jars, of which large numbers are known; they generally bear, in characteristic lettering in blue or yellow, the name of the wine, as "Whit," "Sack," or "Claret." The earliest date known, 1631, is on a mug in the Museum of Geology, Jermyn Street. From 1650 onwards, Scriptural and classical subjects occur on dishes and plaques, evidently copied from French and Italian originals. When the English decorator indulged in an original subject (as in the case of the "Aquila and Priscilla" plaque, illustrated in Mr. J. E.

Hodgkin's "Examples of Early English Pottery"), the result is rather comic. Among the specimens at the British Museum is a standing puzzle-cup, dated 1674, of rather better taste than was usual. It is of good shape, with an open-worked edge, and bears the arms of the Mercers' Company. Near it is a set of six plates, each with a line of writing, which together make up this poem (?):—

1. "What is a merry man
2. Let him do what he can
3. To entertain his Guests
4. With wine and merry jests
5. But if his Wife do frown
6. All merriment goes down."

Professor Church possessed a large dish of Lambeth delft with this inscription:—

"Earth I am et is most trwe
desdan me not for soo ar yov
Jan. 16th 1660 Gorg. and Ellizabeth Stere."

No names are recorded of the earlier Lambeth potters. It was not till 1676 that Van Hamme's patent was taken out.

At Bristol the enamel was thinner and harder than on the Lambeth delft, and more numerous colours were used in the decorations. Richard Frank and Joseph Flower were the best known potters. At Jermyn Street Museum there is a Bristol punch-bowl with the following painted inside:—

"John Udy of Luxillion
his tin was so fine
it gliderd this punch bowl
and made it to shine
pray fill it with punch
lett the tinners fill round
they never will budge
till the bottom they found
1731."

In France the adoption of Oriental styles of decoration took place at about the same time as at Delft in Holland. At Nevers, where Italian polychrome decorations had been in vogue, Chinese models were suddenly accepted, even to the extent of mingling bits of Chinese and Italian ornament together on the same piece, the colour being generally restricted to blue and purple. Presently, however, a characteristic and very handsome scheme of decoration was evolved (apparently about 1630, by a potter named Pierre Custode), in which a deep blue ground of exceptional brilliance is covered with ornaments in the Persian style in opaque white and yellow.

At Rouen, Edme Poterat, armed with a licence that had been obtained in 1646 by Nicolas Poirel, an usher at the French Court, began to make faïence, decorated with a peculiar type of scalloped ornament, termed *lambrequin* and lace patterns, the designs being copied from fabrics and book ornaments of the period. Louis Poterat, a son of this Edme, applied for a

further patent in 1673, for "making porcelain similar to that of China, and violet faïence painted with white and blue and other colours in the manner of that of

HELMET-SHAPED JUG, ROUEN.

Holland." On the expiration of this second patent in 1717, several other factories were established, and the Rouen style of ornament became so popular that it was imitated at other French potteries, at Brussels and

Antwerp, and even at Delft itself. Among the names recorded of the potters at Rouen, it is strange to see those of several Englishmen; an order in council, of the year 1781, authorises the Sieurs Macnemara, Wm. Sturgeon, Simon de Suzay, and Letellier to use coal instead of wood; but the other potters protested against this. One reason given for the great development of Rouen and other faïence at the beginning of the eighteenth century, is the financial condition of the country brought about by the long-continued foreign wars. Louis XIV. "deliberated upon putting himself into faïence," and, in order to obtain money, sent all his gold plate to the mint, and substituted faïence. The nobility followed his example, and largely consoled themselves with elaborate services of pottery richly decorated with coats-of-arms. At Paris, where a potter named Digne was at work about 1750; at St. Cloud, where a factory was commenced in 1695 by the Chicanneau family; at Sinceny (Pierre Pellevé, about 1713); at Quimper (Pierre Caussy); and at Lille (Jacques Febvrier, 1696–1726), the Rouen faïence was imitated with more or less success, and with little characteristic differences that identify the wares. At *Moustiers*, in the lower Alps, a manufactory was started in 1686 by Pierre Clerissy, and became famous for its paintings in blue on a pure white enamel, landscapes and classical figures forming the principal material. The borders suggest Rouen patterns. An artist named

Olery, about 1730, who had spent a few years in Spain, introduced a more extended palette on his return. The *Marseilles* faïence was not unlike that of Moustiers, the name of Clerissy being found in both places. A peculiar iridescent green is found in the decorations proceeding from the works of Honoré Savy, who, in 1777, was appointed potter to Monsieur, the king's brother. Sea-pieces, fish, shells, and sea-plants are a feature of the Marseilles decorations.

Some of the Marseilles workmen were taken to Rennes, in Brittany, and there produced some fine faïence with a pure, milky enamel. A Marseilles man also started a pottery, in 1750, at Montpelier. At St. Amand the faïence chiefly copied Rouen, but introduced a new feature of pure white decorations on a toned white ground, after the style of the Italian majolica, *bianco sopra bianco*. At St. Omer, near Dunkirk, a feature was made of dishes and tureens in the forms of vegetables, and coloured in natural colours.

The faïence made at Sceaux, near Paris, by Jacques Chapelle (1748–1772) was of more original character, the shapes having some architectural feeling. Chapelle would have proceeded with the manufacture of porcelain, but was stopped by the Royal works.

The manufactory at Strasburg, started in 1709 by Charles Hannong for the production of glazed stoves, began to make enamelled faïence and porcelain about

1721, when a German, named Wackenfeld, who had been at Meissen, brought some knowledge of its methods to Strasburg. On the intervention of the Royal works in 1750, the Strasburg porcelain manufacture was summarily stopped, and Hannong's grandson allowed only to continue the making of faïence. This was so perfect, however, and decorated so similarly to the forbidden porcelain, that it too was so heavily taxed as to cause its discontinuance. There is a modelled clock-case in the South Kensington Museum, which shows the perfection to which the Strasburg faïence had attained; all its painted decoration was executed over the glaze. Basket-work borders were first made at Strasburg, and extensively copied elsewhere.

At Niederwiller, Baron de Beyerlé, the director of the Strasburg mint, having enticed away some of Hannong's men, started making faïence about 1742, subsequently disposing of the works to Count de Custine. Every endeavour was made to copy the china then being made at Dresden, and the only special novelty was a style of decoration of which the Niederwiller artists had no reason to be proud. It consisted in painting the ware to imitate the grain of wood, with a sheet of paper bearing a pink landscape on it represented as pinned down by one corner. This somewhat childish idea was proudly styled *trompe l'œil* decoration.

The porcelain made by Louis Poterat at Rouen,

under his patent of the year 1673, was apparently the first really made in France. Not many pieces of his manufacture are traceable now, and it is probable that, busy with the more remunerative faïence, he did not make much porcelain. At St. Cloud, near Paris, it was first made commercially by the Chicanneaus, who, as already mentioned, commenced to make faïence in 1695. The St. Cloud soft porcelain is of a fine milky colour, very transparent; its decorations at first were in the Rouen style. At Lille, Chantilly, Mennecy, Sceaux, and Arras, porcelain began also to be made, but displayed little originality in design.

The factory that eventually became the royal French works commenced in a strange way. In 1740, two brothers named Dubois, who had been dismissed from Chantilly for bad conduct—they had before that been at St. Cloud—offered to sell their knowledge to the Marquis Orry de Fulvy. Like many other great people of the time, the Marquis thought it would be a fine thing to be master of a porcelain factory, and obtaining permission from the king to use the empty riding-school at the Château of Vincennes, installed the brothers there. After three years of failures, the Dubois were turned out as swindlers, leaving the Marquis considerably out of pocket, and in debt to the king. A workman, Gravant, was allowed to succeed the Dubois, and, fortunately, was successful in his results; and a company was soon promoted

under the personal patronage of the king, who, at his own expense, saw that celebrated chemists and artists were engaged. The court was especially gratified when, in 1748, it was possible to send a vase and bouquet of flowers, all in porcelain, to Saxony, to prove that France was now independent of the celebrated Meissen works.

Duplessis, the goldsmith to the king, was appointed general art director; and Bachelier, the superintendent of the decorations. Gravant was responsible for the composition of the body, which was of so delicate a nature that more than half the pieces failed in the firing. The glaze (a lead-glaze), was of beautiful softness, and the enamel colours sank into it in a way quite unapproached by any other porcelain. In 1751, the Marquis de Fulvy dying, the company was reconstituted; and, in 1753, the king taking one-third of the shares, the enterprise became the "Manufacture royale des Porcelaines de France." The works were shifted to Sèvres, into buildings specially erected—buildings which remained in use until 1877, when new works were erected. At Sèvres the manufacture increased by leaps and bounds; Falconet, the celebrated sculptor, had charge of the modelling department; Boucher, Vanloo, and other artists supplied designs; chemists of renown invented the colours that have never since been rivalled—the deep *bleu de roi*, the *rose Pompadour* (or *rose Dubarry*), the *violet pensée*, the *vert*

pomme, and other brilliant ground colours. In 1759, the king bought out the other shareholders, and became sole proprietor, Boileau remaining the manager.

VASE OF SÈVRES SOFT PORCELAIN.

The soft porcelain, beautiful as it was, could only be used for artistic pieces. It was useless for domestic purposes, and could not compare with the wares from

China, and already successfully made in Germany. Many were the attempts made at Sèvres to get over the difficulty; all sorts of experiments were tried; the porcelain invented by Réaumur proved to be only a sort of glass; German workmen were engaged at great expense, only to be discharged again, because they persisted in using German materials. In 1760, an impure kaolin was found at Alençon, with which a few pieces of grey porcelain were made by the Count de Brancas-Lauraguais, who brought a little of it over to Chelsea, and took out an English patent for its use in 1766. At last, in 1768, the head chemist, Macquer, was informed that true kaolin had been found at St. Yrieix, near Limoges, by Madame Darnet, the wife of a surgeon, who—frugal soul—thought that the soft earth of pure white would do excellently well as soap, and was surprised when she was told, by the local chemist, that the substance was the mysterious earth that so long had been looked for. [It is said that Madame Darnet lived to receive a pension from Louis XVIII. in 1825.] By the end of 1769, some sixty pieces of porcelain had been made with the new material, and thenceforward the hard porcelain gradually ousted the older ware, which, however, remained the more highly treasured. Pieces of old Sèvres now fetch enormous prices; at the Bernal Sale, a pair of rose Pompadour vases fetched £1850, and at the Coventry Sale in 1870, a set of three jardinières brought the enormous sum of £10,000.

The porcelains of Italy supply no such connected story as in France. It is said that a Venetian potter had made porcelain about 1500; but there is no trace of his productions. About thirty pieces are known of a translucent ware made at Florence, about 1580, at the private factory of Duke Francesco I. (one of the Medici family). Bernardo Buontalenti is said to have discovered this combination of a clay from Vicenza, sand, and glass, prompted thereto by the sight of some Oriental work. A Japanese embassy visited the Grand Duke in 1585; but the discovery of this "mixed porcelain" appears to have ante-dated their visit. A dish and ewer of this very rare make are in the British Museum.

Soft porcelain was being made at Venice about 1730 by Francesco Vezzi, and about 1760 by Gimminiano Cozzi. Some of the whiteness of the Venetian porcelain was due to the use of tin-oxide (which otherwise, in soft porcelain, is found only in the Chantilly ware). At Doccia, near Florence, the Marquis Carlo Ginori established a factory in 1735, which became very famous. He sent to China for materials, and obtained the services of an eminent chemist, Carl Wandelheim. Their first pieces were Eastern in design; with advancing skill, elaborate efforts were made in modelling, and they imitated Sèvres and Capo di Monte. The latter factory, started near Naples in 1736, by Charles IV., King of the Two

Sicilies, became noted for its effective modellings suggested by marine objects. Some of the pieces are of large size, and yet thin and light. In 1759, Charles succeeded to the Spanish throne as Charles III., and took with him twenty-five of the Neapolitan workmen. These were located in the palace of *El Buon Retiro* at Madrid, and the pieces they produced—quite like those of Capo di Monte—are known by the name of their palatial works. The factory was destroyed during the Peninsular War. Charles's son, Ferdinand, carried on the works at Capo di Monte; but the productions become less and less important, until the closing of the manufactory in 1821.

The English were already great collectors of curios when the accession of William of Orange brought about much closer dealings with the Dutch; and it became a fashionable craze to accumulate the blue-and-white Nankin ware, of which the Dutch had the chief agency. At Hampton Court, there still remain quantities of it on the mantelpieces in the Wren portion of the palace. The Delft wares were also in the Chinese style; and it is not surprising, therefore, that when at last an English manufactory of porcelain was brought into working order, it should be styled "Real Nanquin" ware, produced at "New Canton"—otherwise Stratford-le-Bow. Of Dwight's attempts to make porcelain nothing is known beyond the claim in his patent, and the receipts in his notebooks. No specimens have been identified.

The work at Bow seems to have commenced about 1730 ; but of its actual founder history is silent. In 1744, Thomas Frye and Edward Heylyn took out a patent for making a ware "equal to, if not exceeding in goodness and beauty, china or porcelain ware imported from abroad. The material is an earth, the produce of the Cherokee nation in America, called by the natives *unaker*." With this material—really kaolin —a few pieces of hard porcelain were made ; but the bulk of the Bow porcelain made after that date is a soft porcelain, containing a large percentage of phosphate of lime (calcined bones). The composition of this body was protected by a patent taken out in 1749 by Frye alone. It was so soft as to readily absorb grease ; and had it not been for its thick ivory-coloured lead-glaze but little of it would now be in existence. A characteristic decoration was a sprig of hawthorn in high relief. Groups and figures were made, and, when left uncoloured, are more satisfying in effect than when painted in enamels ; most of this early English coloured porcelain is apt to be tawdry, especially in the imitation of natural objects.

The Chelsea china was apparently contemporaneous with that of Bow ; the greater number of pieces known have a similar composition to that of Bow in respect to the inclusion of bone-ash. The names of Charles Gouyn and Nicolas Sprimont (both apparently Flemish) are connected with the management of the Chelsea works.

George II. was a great patron, and under him workmen were procured from abroad to carry out pieces in the styles of Sèvres and Dresden. In 1769, the works were bought by William Duesbury, of Derby, who, since 1756, had been making porcelain at that place; and six years later, in 1775, he similarly acquired the factory at Bow. He carried on both for a time; but in 1784 moved the moulds and staff down to Derby, and the London work ceased. One has to confess that, as far as art goes, there is little to admire in Chelsea porcelain. The modelling is frequently poor, the shapes tasteless to the last degree, the original work (what there is of it) childish and uninventive. It was a bad period for English art just then. Derby produced some good statuettes in white biscuit porcelain; and its flower paintings by Withers and Billingsley, and cupids by Askew are famous. About 1773 royal patronage was extended to the Derby factory, and the mark became the well-known "Crown Derby." Before commencing at Derby, Duesbury seems to have been connected with William Littler's experiments in porcelain at Longton Hall, in Staffordshire, where between 1745–58 some soft porcelain resembling Chelsea was produced.

The Worcester porcelain works were founded in 1751, chiefly owing to the exertions of Dr. John Wall, chemist, of that city, and Mr. William Davis, apothecary; the latter acting as manager for a company in which they were two out of fifteen partners. At first

the porcelain made reproduced Oriental designs; but, in 1768, the engagement of some Chelsea artists led to the adoption of Dresden and Sèvres ideas. In 1783, the manufactory was acquired by Mr. Flight, who had been acting as the London agent; George III. visiting the works in 1788, the venture became the Royal Worcester Porcelain Company. Several changes of ownership then occurred, without any corresponding benefit to the style of the work produced; in fact, the heavy forms and lavish gilding of the work at the beginning of this century contrast very unfavourably with the earlier work. An early use of transfer-printing, both under and over the glaze, was made at Worcester. To introduce printing from engraved plates was to incur a grave responsibility; for the method is capable of many sins against good taste. It had been invented at Liverpool in 1752 by Sadler and Green, who remained for many years *facile princeps* in the trade; so much so, that Wedgwood used to send a waggon-load once a-fortnight to them to be printed. At Worcester, a great "hit" was made, about 1757, with ware printed with a portrait of Frederick the Great. Carlyle has something to say about this "pottery apotheosis" of his hero. Richard Hancock was the chief engraver at Worcester. The Worcester ground colours are well known: a deep blue, a turquoise, a lapis-lazuli, a pea-green, a maroon, and a canary yellow; the gilding was good, and the painting of

tropical birds and flowers richly done during the earlier and best periods.

One of the constituents of the porcelain body first made at Worcester was steatite or soap-stone. This was obtained from Mullion, in Cornwall. It was in that county that kaolin and petuntze were both found somewhere about 1750 by William Cookworthy, a chemist and druggist, whose business took him frequently into the china-clay districts of Cornwall. He had first made acquaintance with the materials in 1745 when the American supplies of *unaker* came over, and at last recognised the same substances in Tregonning Hill and other places. It was not till 1768 that he took out a patent for porcelain composed of "moorstone, or growan and growan clay," and began to make his wares at Plymouth, engaging the services of a French decorator, Sequoi. Three years after he moved to Bristol, and in 1773 disposed of his patent to Richard Champion, who also had been experimenting with porcelain materials. Henry Bone, A.R.A., a famous miniature painter, served his apprenticeship with Cookworthy and Champion. Although Champion made some beautiful work, notably in biscuit-porcelain, he found himself unable to continue the works beyond 1781. His application for an extension of the patent was opposed by the Staffordshire potters (chief among them Josiah Wedgwood), and, though granted, produced no lasting result. The teapot belonging to a set presented

by Champion to Edmund Burke, was sold, in 1871, for £210. He made some "cottage china" very simply decorated and completed in the one fire. The body of his porcelain is extremely hard, harder than the average Chinese porcelain; some of his statuettes lean over more than was intended, no doubt owing to the hard fire.

Champion's recipes and patent were disposed of in 1781 to a Staffordshire company working at New Hall, and hard paste porcelain was thus introduced into Staffordshire. But the few pieces of their work that are known are quite devoid of taste, and it is evident that none of Champion's skilled men could have followed their master's patent. And thus ingloriously ended the first chapter in the history of hard porcelain made in England.

We must return now in point of time to the German manufactures, to which we have already had occasion to allude. It is to Saxony that the honour belongs of first making real porcelain in Europe, and it was Johann Friedrich Böttger who was the fortunate first maker—fortunate, in that it was chance that placed him in possession of the requisite materials.

Böttger—born about 1682—had found his way to the Court of Saxony, with some reputation as an alchemist. The Elector, Frederick Augustus II., who was very keenly set on discovering the philosopher's stone, allowed Böttger to work in his laboratory. Various experiments had been made without success, when

Böttger complained that he had not crucibles sufficiently refractory. A red clay was given him, and it proved to be fine enough to serve for a red stoneware, so hard that it required to be polished on the lapidary's lathe. This ware was made first in 1708, and came to be called red porcelain, as it was not unlike the Chinese boccaro ware. Pleased with this success, the Elector desired Böttger to produce the white porcelain. Böttger would be delighted to do so, but, like other searchers, he could not put his hand on the proper clays. At last it came about that one day Böttger's wig felt heavier than usual. Upon investigation, he found that instead of flour, it had been dusted with a new hair powder called "Schnorr's White Earth." A suspicion seized him; he got some of this white earth from his valet, moistened it, made a paste with it, fired it, and found that it was *kaolin*, the long sought-for china clay. Where did Schnorr obtain it was the next question. Schnorr was an ironmaster in the Erzegebirge; riding one day near Aue, he noticed that his horse lifted his feet with difficulty owing to a white and sticky clay. Others, no doubt, had seen this white clay before, but it occurred to Schnorr that, dried, it might serve as a hair-powder, of which large quantities were then required. It was not very long before the supply of "Schnorr's White Earth" suddenly ceased, for the Elector took possession of the bed of kaolin, and the valuable clay was carried secretly to Böttger's laboratory in the Castle of

Albrechtsburg at Meissen near Dresden. This became a veritable fortress; the workmen were engaged under oath never to divulge the secrets of the manufacture, and threats of death were placarded about the walls. By 1715 some pure white porcelain was made; the earliest decorated pieces are in blue painted underglaze in imitation of Oriental ware. Böttger died in 1719,

PORCELAIN MANUFACTORY, MEISSEN, CASTLE AND CATHEDRAL.

and was succeeded by Horoldt, who brought a little more originality into the designs. In 1731, Kändler, a sculptor, was engaged, and to his direction are due the groups, figures, animals, birds—whole menageries in fact—for which Dresden is famous. In 1756, Frederick the Great of Prussia took Dresden, and with it, the porcelain factory at Meissen, finding in the house of Count Von Brühl, who then administered the factory,

no less than 1500 wigs with suits of clothes and snuff-boxes to match. During the Seven Years' War that followed, Frederick caused many of the Dresden workmen to go to Berlin, where he was desirous of helping a porcelain manufactory that had been started in 1751 by Wegeley. This seriously crippled the Dresden works; at Berlin they were soon able to employ 500 persons, owing to the energetic fostering care of Frederick, one of whose eccentric orders was that no Jew resident in Prussia should be allowed to marry until he had purchased porcelain to a given amount. Moses Mendelssohn, grandfather of the celebrated musician, had to accept on his marriage—he was not allowed to choose them—twenty massive porcelain apes as large as life, for which he was graciously permitted to pay.

In 1765, as soon as the troubles of the war were over, François Acier, a Frenchman, introduced the Sèvres style at Dresden. Towards the end of the century, Marcolini brought into vogue the severely classical "Directory" and "Empire" taste, and then ensued a period of decay.

Notwithstanding the stringent conditions of employment at Dresden, the secret of manufacture was sure to leak out, and it did so very soon. In 1718, a man named Stenzel, under the inducement of large bribes, went to Vienna to help a Dutchman, Claude Du Pasquier, who had obtained a license from the Emperor of Austria for the exclusive sale of porcelain throughout the empire. In two years' time, Stenzel, dissatisfied

with his remuneration, left Vienna and returned to Meissen. It is not stated if he was re-engaged there or shot. Du Pasquier was left to struggle on, and continue his experiments. Attaining at last some success, he sold the manufactory in 1744 to the Government, the Empress Maria Theresa taking the greatest interest in the undertaking. Niedermayer was engaged in 1747 as master-modeller, and until 1790, the factory was known mostly for its groups and figures. Under the Baron von Sorgenthal at the close of the century, a reputation was gained for painted work, the chemist Leithner inventing several new colours, and using gold lavishly.

PORTION OF A DRESDEN SERVICE.

In 1740 a man named Ringler ran away from the Vienna works and was engaged by Gelz, a potter at Höchst near Mayence, and some good porcelain was produced. A modeller named Melchior produced the statuettes for which Höchst porcelain is best known;

under his successor, Ries (1785), the modelling deteriorated, and the figures all had disproportionately large heads. The manufacture ceased in 1794.

Soon after Ringler came to Höchst, some fellow-workmen managed during a drunken fit to abstract his book of recipes, and copies of these now began to circulate, each of these dishonest workmen being ready to part with his knowledge for a consideration. One copy went to Berlin; another to Furstenburg in Brunswick, where works were started in 1750; another was in the possession of a man named Paul Becker, who, after having tried in vain to sell his knowledge in France and Holland, started work on his own account at Höxter, but was soon bought out by Ringler, who meanwhile had quitted Höchst in disgust, and become director of the works which Paul Hannong, driven away from Strasburg in 1754, had commenced at Frankenthal in Bavaria. Ringler was also instrumental in starting works at Nymphenburg and Ludwigsberg.

In this way knowledge of porcelain-making gradually became common property, and there were numerous little manufactories engaged in producing the ware. Such energy and enterprise would have been much more pleasant to record if the works produced in hard porcelain during last century had been more artistic. It is lamentable that the discovery of its processes should have happened to take place in a period when art was at a very low ebb. When the porcelain of last

century is not inspired by Oriental work—and although there were countless examples (at Dresden especially) of the finest Chinese work to be seen, such inspiration seems to be lacking—it was throughout the whole of Germany but a feeble and clumsy echo of the styles that were in vogue at Sèvres. At Sèvres, the style was Rococo first and last—pompous under Louis XIV., less pompous under Louis XV.; graceful under Louis XVI.; and dead under the Empire—but always characteristic enough in the clever hands of French artists. Imitated by the artists of the numerous states then composing Germany, the results were not remarkable as a rule for beauty or taste. One has only to look at our Museum cases of European porcelain to become at once aware of how very much was lost when the knowledge of its processes was gained. The rows and rows of extravagantly modelled figures, the absurd animals, the garish colouring, the almost entire absence of design, or thought, or taste, almost force one to the conclusion that if this was all that the real porcelain could do, it was not worth the doing, was not worth the long tale of struggles, endeavours, anxieties, and disappointments that had been endured to such an end.

But better work was possible, and was to come.

CHAPTER V.

MODERN.

WITH Wedgwood's achievements the modern era of pottery may be said to commence. The improvements that he introduced into all departments of pottery manufacture were of the greatest value, and have influenced the whole industry. Perfection of workmanship distinguishes his least important piece; and, although the designs of his more artistic wares are wanting in originality—the classic art of his time had that characteristic—the forms were well chosen, and the decorations in good taste. His contemporaries certainly recognised him as a leader; his innovations in manufacture, and his patterns and designs were at once adopted, and copied far and wide. Discouraging as he did any evidences of the individual touch of his artists, the ideal introduced by him was that of a vast machine, producing

mechanically perfect but uniform results. In such an atmosphere art breathes with difficulty, and the production of a cheap, perfect, and soulless article does not always compensate for the absence of the old artistic spirit that struggled for expression through inadequate materials. It is easy, however—in England especially—for people to become reconciled to the absence of art when fashion dictates; and no tears seem to have been wasted when Wedgwood's success—well-earned though it was—drove into obscurity some of the older English wares.

The Wedgwoods were known as potters in the neighbourhood of Burslem for many years before Josiah Wedgwood's birth, on the 7th of July, 1730. His father dying when Josiah was nine, the boy (the youngest of thirteen children) left school and worked for his eldest brother, who had succeeded to his father's glazed-ware business. The family were only moderately well-off, and all the children had to do something; Josiah began to learn throwing. He was a sickly lad, and an attack of small-pox left him with a weakness in one knee. Although apprenticed at fourteen to his brother for five years, he remained with him for three years longer, and then left to enter into partnership with Harrison and Alders at Stoke-on-Trent. Some dissatisfaction with their methods of business led him to withdraw from this association, and he was quickly asked by Thomas Wheildon to join him at his works at Fenton. Of Wheildon's glazed wares we have already

spoken; the young Wedgwood brought into the partnership several new ideas, and a great skill in the preparation of models and moulds, his first six months being devoted to such work. In the course of his experiments he now first began to think of making a body that should not require a coating of glaze, such a body as the "jasper" ware he perfected many years after. He had always been studious, and now, during a long illness, he gave special attention to mineralogy, experimental chemistry, and such other scientific subjects as he conceived should have a bearing on the manufacture of pottery. It may be that he was too enterprising for Wheildon; for, after successfully introducing a new green glaze, Wedgwood ended the partnership, and, returning to Burslem, set up for himself at the Ivy House, in part of some premises already in use by two cousins, and too large for them. This was in 1759. Wedgwood's resources were not large, but his confidence was great. Beginning by making small articles of ready sale, he was meanwhile perfecting the body and glaze of the cream-coloured faïence, which, after it had been patronised by royalty, was entitled Queen's ware. At first entirely without decoration, for Wedgwood had no enamellers or painters, he used to send it, when glazed, to Liverpool to be printed, and such work as required paintings, was sent out to be done. But things soon altered; fresh premises had to be taken to keep pace with his orders. In 1765 he

took into partnership his cousin, Thomas Wedgwood, who had just ended a six years' apprenticeship to him, and to Thomas was intrusted the special superintendence of the "Queen's ware" and other *useful* branches. Having made the acquaintance, in 1762, of Thomas Bentley, a merchant of Liverpool, he persuaded him, in 1768, to become a partner for the *ornamental* branches of the manufacture. Bentley was of the greatest assistance, being well known to the Court and aristocracy. With him in charge of the warehouse in London, it became a fashionable resort, and there was a "boom" in Wedgwood wares. In 1768, Wedgwood had to suffer the amputation of his lame leg, and thenceforward walked with a cork limb. The next year saw the opening of some new works, planned on the most extensive scale, on an estate that Wedgwood had acquired near Burslem for £3000. It was on the banks of the new Bridgewater Canal, then in course of construction under Wedgwood's not altogether disinterested efforts as treasurer to the Committee. The proprietor had chosen the name of *Etruria* for the new town, and still further marked his classic proclivities and his hopes by inscribing on the first six vases made — he throwing them, and Bentley turning the wheel—the legend :—

"Artes Etruriæ renascentur."

The only patent that Wedgwood took out (in 1769)

was for encaustic painting in imitation of the Etruscan (really Greek) vases, which at that time were being illustrated in many sumptuous volumes. Both shapes and decorations were suggested by these examples of antique art, but Wedgwood's dull enamel colours did not by any means equal their effect. An "Etruscan bronze," also introduced about this time, was not much used. More successful was the "jasper body," which Wedgwood had evolved from his experiments with English spar or *cawk;* with this as the principal constituent, he was able to obtain a quite new range of effects; the ware was intensely hard and vitreous, and required no glaze, metallic oxides, used as stains, giving him blue, lilac, pink, sage-green, olive-green, yellow, and black. These, with white, provided the palette with which all the finest examples of his cameos, bas-reliefs, statues, seals, medallions, and ornamental pieces of all kinds were produced. Although the spar, mined in Derbyshire, was conveyed by a roundabout route through London, and carried at night to cellars under Wedgwood's private rooms at Etruria, a workman soon spread the secret, and *barytes* was at once used by unscrupulous imitators (of whom Wedgwood had many).

Occupying more than a year in production, Wedgwood was engaged, in 1773–74, on a remarkable service of ware for the Empress Catherine of Russia. It comprised 952 pieces in cream-colour, each having one

or more views of scenes in England painted upon it in purple, and a green frog underneath. The price paid was £3000, and the precious cargo was conveyed to the Grenouillère Palace at St. Petersburg. Not a piece of it is now known to exist, which is perhaps fortunate for Wedgwood's reputation.

In 1775, Flaxman first worked for Wedgwood, and continued to do so for many years. To him were due some of the finest portraits and classical subjects; Flaxman's chaste style was eminently suited to the fashion of the Wedgwood productions. On the death of Bentley, in 1780, Wedgwood obtained the assistance of Alexander Chisholm in the laboratory, and an excellent modeller named Webber was placed in charge of the ornamental department. Relieved of some of his cares, Wedgwood was now able to devote some time to other matters. He invented a pyrometer or instrument for measuring high temperatures, and was elected F.R.S. in 1783, at the same time as Dr. Priestley, with whom in chemical experiments he had long had some amount of intimacy.

One of the last—and, as it was considered at the time, one of the greatest—of Wedgwood's achievements was the copy he made in jasper ware of the celebrated Portland or Barberini vase. Webber was paid as much as 500 guineas for making the model, as it was impossible to obtain permission to make a mould from that priceless example of antique glass. Wedgwood hoped

to recoup himself by selling fifty copies at fifty guineas each, but by the time they were issued, much more than that had been expended. The original antique

WEDGWOOD'S COPY OF THE BARBERINI VASE. BRITISH MUSEUM.

(now broken) and one of Wedgwood's copies may be seen in the British Museum. Despite the beautiful work to be seen in the modern reproduction, and the evidence it affords of Wedgwood's enthusiasm, one

cannot help feeling that, in a sense, it was time and money wasted—typical of a good deal of Wedgwood's mistaken art. For copying is not art, and one may have too much of "classic feeling."

Thomas Wedgwood had died in 1788. In 1790, Josiah took his three sons and a nephew into partnership; and a treaty between England and France brought an enormous increase of trade to the firm. On the 3rd of January, 1795, Josiah Wedgwood died at Etruria.

It is curious that he never attempted the manufacture of porcelain. His nephew, Thomas Byerley, introduced it at Etruria about 1808, but it was discontinued after a few years.

Of Wedgwood's contemporaries in Staffordshire, several must be mentioned. John Turner is specially famous for cream-coloured stoneware or semi-porcelain; his cane-coloured or bamboo ware, black basalt, and blue-and-white jasper, almost rival Wedgwood's. He was working at Lane End from 1762 to 1786, having been at Stoke six years earlier engaged in the manufacture of white stoneware. Turner was associated with Wedgwood in the opposition to the extension of Champion's patent; between them they managed to secure that Champion could claim the exclusive right to use the Cornish clay in only transparent ware, while they, and any other manufacturers, might use it for other wares and glazes.

Henry Palmer, of Hanley, had a reputation of an

unenviable kind as an imitator of Wedgwood's wares, being not at all particular as to how he acquired his patterns or his recipes. Wedgwood was very much exercised as to the unlawful proceedings of Palmer and his associates, and had to bring legal pressure to bear. Palmer got into difficulties eventually. A clever modeller, who had worked for Wedgwood, but left him, was J. Voyez; he drifted into Palmer's employ, forging the Wedgwood marks on some of his medallions. Some pieces bear his own name honestly enough, and are considered excellent.

Elijah Mayer worked at Hanley, 1770 to 1813, and produced some beautifully finished black basalt, buff, and cane-coloured wares.

One of Wheildon's apprentices, Josiah Spode, set up for himself at Stoke in 1770, and laid the foundations of a very important business. He made wares of the same character as Wedgwood's, and, in addition, large quantities of blue-printed, cream, and white. His son, also Josiah, who succeeded his father in 1797, was the most successful potter of his time, and realised a great fortune. He first began to use pure felspar in the composition of china, and, as it was supposed for a long time, also bone-ash. But analyses have proved that bone-ash had been used at Bow, Chelsea, and Worcester many years before. An ironstone china was also made by the second Spode. The works are now carried on by Messrs. Copeland & Sons.

Miles Mason, of Lane Delph, brought the ironstone china to perfection, a patent being acquired in 1813; the special ingredient was ironstone slag, ground and mixed with the flint, cornish stone, and clay.

To Thomas Turner, of Caughley, was due the famous "willow-pattern." He had been an engraver at the Worcester porcelain works; acquiring an earthenware pottery in 1772, he erected some new works specially for china, and in 1780 produced the willow-pattern. He is said to have made the first blue printed table service ever made; the pattern was called the *Nankin;* among those connected with its preparation was Thomas Minton, an engraver, the subsequent founder of the great establishment at Stoke known by his name. He began independently in 1790, and for a few years made only earthenware. In 1798 he commenced to make porcelain, and the work produced during the following ten years is much sought after by collectors. In succeeding years, earthenware of finer sorts was added, and Parian ware, tiles, mosaics, majolica, and Della Robbia ware introduced. Both Mintons and Copelands claimed the honour of inventing Parian.

Mintons have at different times employed many famous French artists: Carrier Belleuse, the sculptor, and M. L. Solon, the unrivalled worker in *pâte-sur-pâte,* among executive artists, and Léon Arnoux, as technical director. As carrying on a famous name, it is interesting to see that Léon Solon, after leaving the

South Kensington Training School, has just followed his father to Mintons as a designer. Formerly connected with the firm of Mintons, Mr. M. D. Hollins has now for some years been independently producing all kinds of plain and decorated tiles; an industry of great importance from an architectural and sanitary point of view.

Ralph and Aaron Wood—two potters already mentioned in connection with the white salt-glazed ware—were noted in other directions. Ralph Wood made a "granite" or "porphyry" ware by piecing different coloured clays together over the surface of a piece, and then smoothing them down. His group, "The Vicar and Moses," was reproduced again and again in coloured earthenware, until with continued remodellings all its vigour was lost. There was a great demand throughout last century for these Staffordshire figures and groups of quaint modellings and gay colourings; they were not very much worse than the more fashionable porcelain figures, and sometimes much better. Enoch Wood, a grandson of Ralph, modelled a bust of John Wesley in 1781; he was a maker of jasper and basalt wares at Burslem, 1783 to 1840, and an enthusiastic collector and historian of the old English wares.

The cream-coloured or "Queen's" ware, as improved by Wedgwood, was naturally imitated by others. Among these, Hartley, Greens & Company, of Leeds, produced, about 1780 and onwards, some really interesting moulded and perforated ornamental pieces. Some of the patterns

are identical with those of Staffordshire salt-glaze pieces, and it may be owing to this that examples of the latter are sometimes described as "Leeds" ware.

Salt-glazed stoneware, displaced for table use by the smoother Queen's ware and china, and for ornamental use by the more fashionable soft and hard porcelains, remained unused, except for the commonest purposes, until its revival by the firm of Doultons at Lambeth. Founded about 1815 as "Doulton and Watts"—John Doulton having originally been an apprentice at Fulham, where Dwight's descendants still carried on a common stoneware trade—the new Lambeth firm gradually acquired a reputation for useful brown and enamelled stonewares. Mr. Henry Doulton was the first to plan a factory (about 1846), for the special manufacture of stoneware drain-pipes for sanitary purposes. These are now made in enormous quantities, but the original makers still retain their pre-eminence. However, these and other utilitarian wares would perhaps have remained unnoticed by the world had it not been for the introduction, in 1867–1870, of the "Doulton-ware Sgraffito" pottery. These were vases and jugs made in the common pipe-clay, with simple incised or stamped patterns, coloured equally simply, and fired in the open kilns along with the common bottles and jars. The exhibition at South Kensington of the first few of these met with such appreciation that Mr. Doulton was encouraged to proceed, and he

soon was able to gather round him — at first in

A STUDIO AT MESSRS. DOULTONS'.

improvised workrooms, and later in specially-erected blocks of studios—a clever band of workers, of whom

several have since become well known. The majority of these artists came from the Lambeth School of Art, and furnish an excellent example of what might oftener prove a fortunate connection between an art-school and a local industry. Some other wares perfected at Lambeth were the "Lambeth Faïence," on an earthenware body, with decorations painted on the biscuit, and then glazed; "Impasto" ware decorated while soft with coloured slips, then biscuited, and glazed; "Crown Lambeth," a fine faïence; and "Marqueterie," a development in faïence of the marbled agate wares of last century. No porcelain is made at Lambeth; at the Burslem works belonging to the Messrs. Doulton, fine earthenware and china are produced. In 1887, Mr. Henry Doulton was knighted, having already received the Albert Medal in 1885, "for the impulse given by him to the production of art pottery in England."

Of his artists, we may mention Miss Hannah Barlow, Miss Florence Lewis, Mr. John Eyre, Mr. Mark Marshall, Mr. Arthur Pearce, Mr. John Broad, and Mr. George Tinworth; the latter known especially for his modelled terra-cotta panels and statues, some of the most spirited work in clay seen in modern times. Mr. Tinworth's romantic story should be read at length in the Biography by Mr. Edmund Gosse.

Of another Lambeth industry—well-known in its time—we must say a few words. "Coade's Lithodipyra or Artificial Stone Manufactory" was estab-

lished about 1760 in the Pedlar's Acre, and several famous sculptors of the time worked for it, notably John Bacon, R.A., Rossi, and Bubb. Large figures were made for buildings, and many of these are in existence, although unrecognised as terra-cotta. The "artificial stone" was terra-cotta under another name; the term, however, is significant of the mistaken view that was taken, until quite recent years, of the architectural possibilities of terra-cotta. This clay material, worked while plastic, and undergoing the ordeal of burning, was treated as if it were a substitute for stone, and was expected to provide blocks as large as could be obtained in that natural material. Needless to say, the irregular lines occurring under such conditions would prejudice many against the use of terra-cotta. But with smaller blocks—for it is now more generally recognised that terra-cotta is nothing but glorified brick—a great future is opening for such an easily-worked material. It seems to be especially suited for large towns, where stone is soon acted upon and discoloured by the impure atmosphere, and its warm and varied tones now light up many a city vista. Several large buildings have been lately erected in terra-cotta, as, for instance, the Natural History Museum at South Kensington (designed by Alfred Waterhouse, R.A.,) where the numerous modelled enrichments of animals, represented as perched on all the pinnacles, or clambering up the roof inside, are—equally with the walls—all in terra-cotta.

Modellers have, of course, always been, as it were, next-door neighbours to potters, working as they generally do with plastic clay for their sketches. Recognising that the clay sketch has frequently more vivid character than its copy in marble or bronze, it is no uncommon thing now to see the fired clay model accepted as a finished work, and exhibited for itself

A GROUP OF MODERN ROYAL WORCESTER PORCELAIN.

alone. Busts, panels, and small groups in terra-cotta are frequently seen at the Royal Academy.

Ceramic materials for architectural purposes may be seen in other forms than terra-cotta. Glazed tiles, plain or modelled; fire-clay bricks, glazed or enamelled; terra-cotta blocks coated with coloured glazes or enamels — these are all being gradually brought into use, and give very valuable opportunities

for effects of bright colour. Where harder materials than these are required, the architect can now use stoneware blocks, either with salt-glaze colours or opaque vitreous enamels, such as are both being made by Sir Henry Doulton. Of decorative tile makers there are, to name only a few, Messrs. Boote, of Burslem (founded 1843); Messrs. Malkin, Edge & Co. (1867); Messrs. Craven, Dunnill & Co., of Jackfield, and Messrs. Maw & Co., of Benthal. The latter firm is obtain-

THROWING AND TURNING ROOM, WORCESTER WORKS.

ing some reputation for its lustre painting, this difficult method having been reintroduced in England by Mr. de Morgan, whose faïence generally, on tiles and vases, on the old Persian lines, is of the most artistic kind.

Only brief mention can be made of some of the remaining English manufacturers. Turner, of Caughley, has already been named. Robert Chamberlain, who had been the first apprentice at the Worcester Porcelain Works, set up in business for himself in 1786, obtain-

ing his ware in biscuit from Turner and decorating it, decorating also ware for Turner. The new venture was so successful, as to prove a dangerous rival, and eventually, in 1840, the two establishments at Worcester were combined, the staff from the original works being transferred to the new. The works are now carried on by a company, Mr. R. W. Binns being the art director.

About 1794, Job Ridgway, who had been one of Wedgwood's apprentices, started some works at

PRESSING ROOM, WORCESTER WORKS.

Cauldron Place, Hanley. On his death, in 1814, they were continued by his sons. Mr. Moore, who had for many years been engaged in the works, joined the firm in 1855, and the name is now Brown, Westhead, Moore & Co. They are famous for earthenware and china, and have made several elaborate services for royalty.

At Liverpool, Richard Chaffers commenced making earthenware about 1752; and, after successfully mining

for soapstone in Cornwall, began making china with it in 1755. In 1765, incautiously visiting his favourite foreman, Podmore, who was dying of fever, Chaffers himself took it, and died. Other Liverpool potters who produced fine earthenware and china were Seth Pennington and Philip Christian. In 1796, a migration of potters and their families took place from the neighbourhood of Burslem to Toxteth Park, at Liverpool, where some works had been acquired by Messrs. Worthington, Humble & Holland. In imitation of Wedgwood's "Etruria," the firm called their little colony "Herculaneum." They began to make blue-printed ware and Queen's ware of excellent quality. Enlarging their works, they produced terra-cotta and china.

One of Thomas Turner's apprentices at Caughley, named John Rose, started business for himself about 1780, at Jackfield, soon after moving to Coalport. In 1799, on the death of Turner, Rose bought the Caughley works, and kept them going till 1814. About 1820, he bought up works at Swansea and Nantgarw, taking to Coalport the famous William Billingsley, who died in 1828. In 1820, Rose obtained a medal offered by the Society of Arts for a glaze containing neither lead nor arsenic. He died in 1841. The Coalport works have sometimes been known as "Coalbrookdale."

Billingsley was a very clever painter on china, and a practical maker also, but apparently something of a "rolling stone." Apprenticed to Duesbury, at Derby,

and famous there for his "flowers," he remained twenty-two years, and then in 1796 started a little factory at Pinxton. He made here a china with a peculiar granular body like loaf-sugar. Four years after, he started a similar concern at Mansfield; again, a few years, and he was at Torksey, in Lincolnshire; then at Wirksworth, in Derbyshire. A little tired of roaming, he was engaged at Worcester in 1811, but hurriedly left two years later, going to Nantgarw, an out-of-the-way place near Pontypridd. At this place, with his son-in-law, Walker, who was a clever man at building kilns, he again started a china works. Here they were visited, at the request of the Board of Trade, by Mr. Dillwyn, of Swansea, an earthenware manufacturer and writer on natural history. He found that nine-tenths of their pieces were spoilt in the firing, and offered to build them two kilns adjoining his own works at Swansea. Receiving a letter from Messrs. Flight & Barr, of Worcester, to the effect that Billingsley and Walker "had clandestinely left their service," Mr. Dillwyn dismissed them, and they returned to Nantgarw. Then came Mr. Rose from Coalport, who was afraid that their work would prejudice the sale of his, and managed to buy them up, stock, moulds, and recipes, and carried everything off to his own works. Mr. Dillwyn was glad enough to dispose of such things as they had left with him, and so closed a curious and interesting episode in the history of English china.

In Ireland, the annals of ceramic manufactures are very brief. Delft-ware was made at Dublin early last century by Captain Delamain, but the manufacture ceased on the death of his widow in 1760. At Belfast a pottery was working in 1688, and some delft-ware, dated 1724, is in existence. The modern china, produced at Belleek, county Fermanagh, is extremely pretty, and noted for its peculiar iridescent glaze. The works were established in 1863 by Messrs. M'Birney & Armstrong, the local felspar having been found to be of exceptional purity.

In Scotland there are numerous potteries, although none, perhaps, have as eventful a history as the English. At Glasgow, a delft-ware factory was started in 1749, in a lane which was called the "Delft-Field Lane," a name afterwards altered to "James Watt Street," in honour of the inventor of the steam-engine, who, it is said, carried out some of his experiments in the pottery. About 1770, Queen's ware was also made, and, later on, china. The earthenware and china works of Messrs. Bell & Co. were established in 1842. The Bo'ness Pottery dates from 1766; the Alloa Pottery from 1790.

A good deal of stoneware is made in Scotland, the Port-Dundas Works having been started about 1819, the Caledonian Pottery at Rutherglen about 1780, but not turning their attention to stoneware till 1850; and the Portobello Pottery, about 1770, which began to make stoneware about 1840.

Turning now to resume the story of French porcelain,

it is interesting to see what a difference the discovery of kaolin had made. Larger pieces could now be produced, and at Sèvres, under royal patronage, the most elaborate pieces were attempted. In imitation of the royal works at Sèvres, the nobility felt impelled to have their own works and little staff of artists, and thus we hear of the establishments in Paris, either really belonging to, or closely patronised by, the Queen (Rue Thiroux); the Count of Provence (at Clignancourt); the Count of Artois (Faubourg St. Lazare); the Duke of Orleans (Pont-aux-Choux); the Duke of Angoulême (in the Rue de Bondy); at Lille, the Dauphin; at Orleans, the Duke of Penthièvre; at Vincennes, the Duke of Chartres.

Boileau, the director at Sèvres, died in 1773, leaving the establishment in a prosperous condition. Six years later, it had been made insolvent through the mismanagement of his successor, Parent, who was ultimately sent to prison. Régnier was then appointed, and remained in office until the collapse caused by the Revolution. The National Assembly had decided in 1791 that the works at Sèvres and the Gobelins were not to be national property, and they were left severely alone to get on as best they could without funds. The arrears of wages were not finally cleared off till 1808. During the darkest days the few artists and workmen who lingered on had to solicit rations from the Government stores. In 1800, the directorship was placed in the hands of Alexandre Brogniart, under

whose long rule of forty-seven years, carried on through all the strange changes of French government, the greatest improvements were made, and many valuable discoveries first introduced, and made public for all to use. Brogniart was almost the first to scientifically study pottery, and his researches and conclusions were of great value. In one respect, however, he is thought to have been unwise. Soon after his appointment he decided to produce only hard porcelain ; its naturally simple composition appealed to his scientific predilections, and the soft paste, with its elaborate mixtures and difficult firings, had to go. He was still further confirmed in his resolution by the almost simultaneous deaths of the foreman who had been responsible for the mixing of the bodies, and of the head fireman. He rashly decided to sell off all the stores of biscuit remaining undecorated. The pieces were, however, acquired by some sharp dealers, who proceeded to get them decorated in the old Sèvres style, and these half-genuine pieces were then palmed off at good prices as real Sèvres. In many cases the fraud was never discovered, and only some very slight error in the forged marks led to the detection of others.

Ebelman, who in 1847 succeeded Brogniart, had regretted the cessation of the soft porcelain, and wishing to reintroduce it, was hunting up the recipes for the mixtures, when an old member of the staff called his attention to some covered tanks of clay that had

not been disturbed for years. On inquiry being made it was found that these contained a large supply of the paste; it had been hidden away there in 1804 by an intelligent cellarman who did not like to destroy it. This was very fortunate for the new director; he not only had sufficient clay to at once recommence the manufacture, but a reliable standard for his new mixings.

Victor Regnault (father of the celebrated painter Henri Regnault), Louis Robert, Lauth, and Deck have been successively heads of the Sèvres works. The latter had already acquired a great reputation as a maker and decorator of faïence when he was asked to superintend at Sèvres. His handbook to "Faïence" is a standard work on the subject. The distinguished chemist Salvetat, who died in 1882, was for many years connected with Sèvres.

Of provincial porcelain works, other than those mentioned, the most important were those at Niederwiller—already famous for its faïence; Marseilles under Joseph Robert, La Seinie, Valenciennes, and Limoges. At the latter town, near as it is to the beds of kaolin at St. Yrieix, but little porcelain was made during last century, and what was made was sent to Paris to be decorated. With the advent in 1840 of Mr. David Haviland, a china dealer in New York, and his enterprising efforts to introduce some fresh ideas among the Limoges makers, a busier era opened, and the town is now the centre of the French porcelain manufacture, with thirty or forty firms at work, the house of Haviland

& Co. occupying no inconsiderable position. Their latest achievement is the production of *flambé* porcelain, and in this they may be said to rival the hitherto unrivalled Chinese work.

During this century many original kinds of faïence have been produced in France. Brogniart did a great deal to revive interest in the matter, and allowed experiments to be conducted at Sèvres. In 1854 a special studio was opened there for tin-enamelled faïence and glazed terra-cotta, but it was closed in 1871, as meanwhile several independent manufactories had sprung up, chief among them that presided over by Theodore Deck, who, not content with originating a very rich style of decoration in coloured glazes, has imitated successfully such widely different styles as the Rhodian faïence, Chinese celadon, the inlaid work of Oiron, Italian majolica, and Hispano-Moresque lustre.

Very little stoneware is made in France. At Voisinlieu near Beauvais, a sculptor named Ziégler was producing, between 1840 and 1850, some modelled pieces in brown salt-glazed ware, but with his retirement the production ceased.

Decorative pottery for architectural purposes has been latterly making great advances in France, the architects Charles Garnier and Paul Sedille, having been very prominent advocates of the new effects to be obtained. The buildings of the last great Paris Exhibition of 1889 were many of them erected in faïence, and the brilliant colour-

ings of tile-covered domes and modelled wall-panels excited great attention among architects and artists.

But little need be added to what we have said of the porcelains of Germany and Austria. The royal works at Vienna after many vicissitudes were closed in 1864; their rivals at Berlin and Dresden still continue. At St. Petersburg the establishment founded by the Empress Elizabeth has continued its existence mainly by the help of artists from Sèvres.

Among the wares produced in such profusion from the potteries of Italy, Germany, Bohemia, Hungary, and elsewhere, much of it very brilliant and suggestive, it is possible that we in England do not see the best and most artistic. Our importers do not always credit us with the possession of sufficient taste, and too frequently provide us with the more garish of foreign work. It is in fact said that most of the German potters work with a special eye to the English and American markets. If this be true, it is very sad. There is, however, an undoubtedly growing movement of improvement in the public appreciation of artistic pottery, and it is very significant that there is even now a tendency abroad to imitate the latest efforts of our English designers. To at last have it recognised that there is an English school of design is extremely encouraging, and with English technical methods at a perfection admittedly unapproached by other nations, there is every reason to expect continued prosperity for that most important

of our national industries the "art and handicraft of potting."

In a sketch so brief as this of so large a subject, much has of necessity been omitted. As with the general history of a country a list of the monarchs and their deeds gives but a very partial, if not false, idea of the real progress of the nation, so here with a history of pottery, it would be unfair to assume that the master potters alone made the history. A little has been said of the mischief and loss caused here and there by some dishonest workmen, but nothing has been said, or very well can be, of the vast and faithful army of servants in whose hands rest, to a large extent, the fortunes of their masters. The guardianship of valuable secrets, the patient routine of daily work, the physical exertion expended in manual labours, the prolonged and exhausting anxieties of firing, the ungrudging service of designers, artists, colour-grinders, even of cellarmen and warehousemen—all these go unrecorded, but are none the less a part of history. The wonderful variety of the ceramic work of the present day, and the widespread importance of the industry, would have been impossible but for the honourable efforts of many and many an unknown, undistinguished worker labouring to do his best in his appointed task.

APPENDIX.

SOMETHING ought to be said concerning American pottery, although the subject deserves to be treated at greater length than in these notes.

Vanished early races have left ceramic remains in most of the American countries. In Ecuador, pottery is found below a marine deposit of several feet in thickness. Among the strange and vast temple ruins in Central America, urns have been found, and grotesque figures, some of these being of very hard terra-cotta. Along the Mississippi valley are numerous relics of the unknown people called, for want of a more precise term, the Mound Builders. They used sun-dried bricks for walls and embankments, and had some primitive ideas in decorated vases. The ancient Peruvians had a very distinctive pottery, and some of the water-bottles in the form of heads are of a really fine type, the modelling

vigorous as that of the best Egyptian work. In fact, some of the ornamental patterns, the meanders, lozenges, and suggestions of animal forms are strikingly like Egyptian and archaic Greek work. In colours, they used white, yellow, red, chocolate, and black — all earthy colours, of course. Many of the quaint forms of joined vessels with twisted tubes were no doubt designed with a view to keeping insects out of the water contained in them. The Spanish conquest was the death-blow to most of the ancient manufactures. Only in Mexico were the traditional methods retained in a small way. The modern Pueblos make some wares which have a certain sale as curiosities.

In the Northern States, it was the Dutch who introduced bricks from Holland. Governor Van Twiller erected, in 1633, a brick house on Manhattan Island, the first of its kind. When the English acquired a footing, bricks from England were imported, and with them English builders. The old Colonial style of architecture, a refined phase of Georgian, is now looked back upon with admiration by modern Americans. It was in 1744 that Frye's patent for making china at Bow mentioned the use of *unaker* from America. This had been found in Virginia. Some of it was shown to Cookworthy, who soon after found similar materials in Cornwall. A little later, Wedgwood used some clays from America, and wished to have more. But no very great use was made of the deposits of kaolinic materials,

and a little porcelain factory started at Philadelphia in 1771 seems to have produced but very few pieces.

About 1800, clay was dug at South Amboy for stoneware, and by 1812, New Jersey clay was in use for firebricks. In 1829, Henderson & Company, at Jersey City, commenced a pottery, and made cream-colour and printed ware, competing in a small way with England. Their throwing and burning—the first on the English principle in America — were done by William and James Taylor. In 1838, the first pottery in New York was founded. Between 1816 and 1830, W. E. Tucker was making china and hard porcelain at Philadelphia. Somewhere about 1830 George Walker, the associate for so many years of Billingsley of Derby, went over from England, and started the "Temperance Hill Pottery" at New Troy.

In 1852, the Trenton works were commenced by Taylor and Speeler. At first common yellow and Rockingham wares were made, then white granite ware, then china. Trenton is now the centre of the American china trade, and is often called the "Staffordshire of America."

At Greenpoint, T. C. Smith, after two years' experiments, began, in 1866, to make true kaolinic porcelain with native materials. In 1877, Mr. John Bennett, one of Doulton's artists, settled in New York, and introduced the Lambeth style of faïence painting.

Nothing so rich in colour had till then been seen in American pottery.

The European exhibits at the Centennial Exhibition of Philadelphia in 1876 were great incentives to the American potters, and it may now be said that in beauty of workmanship and originality of ideas the leading firms have little to learn. As regards the more practical side of ceramics, brick and terra-cotta making, the Americans have gone to the front in a remarkable way; new machines and new methods of burning attest their inventiveness; numerous improvements in terra-cotta have revolutionised American city architecture, and buildings are erected now in steel and burnt clay which a few years ago would have been thought impossible.

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