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F. D. Millett

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Frank Davis

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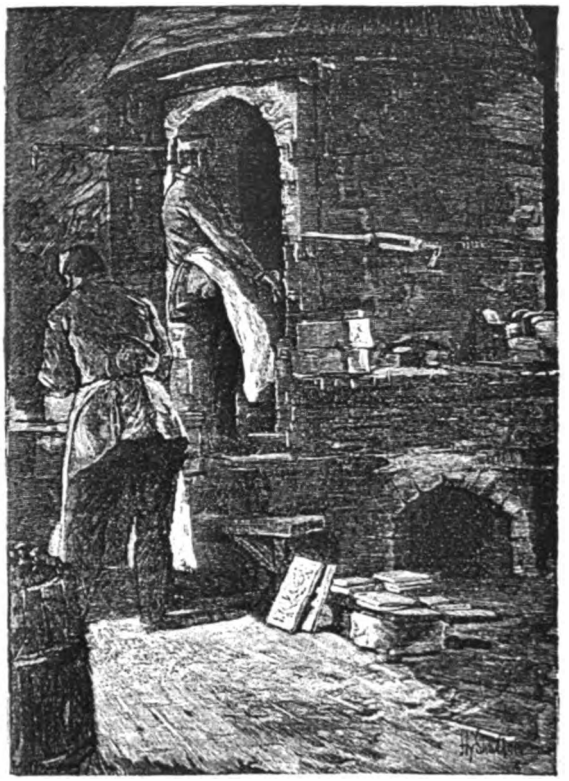


CHARGING THE KILNS.

THE manufacture of artistic tiles in the United States dates from so recent a beginning that few persons who are not especially interested in ceramics are aware of the existence of tile-works on this side of the ocean. The tiles of English manufacture, representing many years of costly experiment and enormous expense of production, have hitherto filled the market of the world. The very perfection of these tiles has discouraged serious attempts at imitation, and they have covered the field of decoration so well that it has seemed hopeless to attempt to compete with them in design or invention. Nevertheless, several manufactories have been started in this country during the past few years, with the intention of making an article similar to the imported one. The chief of these is the one now in operation in Chelsea, Massachusetts.

The imported rage for household decoration, which the Philadelphia Exhibition developed and fixed, has given a great stimulus to industrial art in this

country. Many artists of high rank in the profession have responded to the demand for good decoration, and for a time have left their canvas to work on ceilings and walls. The Low Art-Tile Works in Chelsea is the direct outgrowth of the influence on the artistic mind of the increasing public demand for decoration. The tiles which are there drawn from the kiln are not only excellent as specimens of mechanical workmanship, but they discover much originality of design in form, color, and construction. As they are made to-day, they form a new species of ceramic ware; and the inventor, Mr. J. G. Low (certain processes used by him are covered by patents), regards the manufacture at present as rudimentary in comparison with what he is confident of accomplishing in the future. This opinion is fully warranted by the steady progress made from kiln to kiln, and in the means through which this advance is accomplished. Indeed, the best evidence of these statements may be found in the tiles themselves, which suggest great and enticing possibilities, and give promise of future elaboration and development.

Mr. Low put aside his palette only three years ago, and the tiles which bear his name to-day are the result of study, experiment, and practice since that time. A turn of mind which may best be described as peculiarly American, gave him the impulse to investigate and the persistence to pursue the study of the methods of tile-making. From 1858 until 1861 he had studied in the *ateliers* of Couture and Troyon in Paris, and since that time had been engaged in decorative and scenic painting. His education particularly fitted him to appreciate the artistic value of tiles in decorative work, and his experience as a decorator gave him exact knowledge of the limitations of interior ornamentation. Remembering what a great part of the success of an artist depends on the drudgery of elementary work, he began at the beginning, and spent a year in a pottery, designing shapes and reproducing some of the Etruscan pieces from the Englefield collection in England. Accustomed to work on his own responsibility, he could not long be content to imitate, and after his apprenticeship of a year he decided to make an attempt to produce tiles which should not simply be decorative, but should have a special artistic value, an individual character of their own. The Hon. John Low joined his son in partnership, and a manufactory with materials, machinery, and kiln was soon ready. The experiments began at once, and continued for months, interrupted only by the delays caused by constant failures. The history of these months of experiment counts few or no bright days. Different kinds of clay were tried, often with the loss of an entire firing. Most of the best clay-beds in the country were drawn upon before the proper material was found. Then followed countless trials of mixtures, for the stock of which tiles are made, although called clay by everybody, even by the ceramist himself, is a mixture of various materials — flint, quartz, spar, clay, and ground tiles.

It is impossible to give a complete idea of the difficulties of experimenting with the manufacture of "biscuit," as the tiles are called before they are glazed, without going fully into the details of the accidents to which the tile-maker is liable, and recounting the perplexing and annoying failures which stop his progress at every step. This is a subject requiring too voluminous treatment

A PLASTIC SKETCH.

to be undertaken here. Enough to say that Mr. Low did at last succeed in producing flat, square, and true tiles, free from cracks or distortion, pure white in color, and in every way as perfect as those of foreign make.

After the perfection of the biscuit came the glazes, and these in their turn were quite as difficult to manage. Different compositions of biscuit take different glazes, and there is always open to the ceramist an enticing opportunity to discover new colors or refine those already in use. Here again Mr. Low's training as a painter proved of great value to him. He produced many original glazes, exceedingly strong in tone, rich and brilliant in color. As a result of all this experimenting, he was able at last to put into permanent form some of the ideas which had given him the courage and patience to carry on his work from the beginning. One of the earliest forms of tile made was the so-called dust-tile. His first ambition was to make this with a pattern in relief, so that, when glazed, it would have both the charm of form and the beauty of

color. He began by carving flat tiles before they were baked, and in this way succeeded in making some beautiful specimens with patterns of his own design. This process of hand-carving was so slow and tedious that he shortly began to study out a means to simplify and shorten it. He made his own designs from natural objects, vines, leaves, and flowers, conventionalizing them in the accepted manner. While at work with these objects, it occurred to him to try to use them as natural patterns, and to stamp them into the tile just as they were, thus doing away with the intermediary process of imitation by hand. The experiment proved to be a success, and he soon produced these natural tiles with great facility. The inventor's own words will give a good idea of the process:

"How did I think of that first? Why, I was bothering over a dust-tile, — and this process is a half-century old, and ought not to bother any one, — when suddenly it occurred to me that it might be possible to stamp a figure, or a letter, or indeed, any form whatever, upon the face of a tile just as the manufacturer's name is stamped upon the back. Since this could easily be done, of course it would be possible to take the imprint of any natural object that had little enough relief to permit it to be readily lifted from the clay. I naturally thought of leaves as the material nearest at hand, and rushing out of the shop, down behind there, toward that brick-yard, I found a mullein-leaf. I hurried back, put the dust into the press, flattened it down by a light pressure of the screw, then laying on the leaf, gave the screw a hard turn. I pressed the juice all out of the leaf, but I got my imprint perfectly, ribs and all, even to the downy texture of the surface. This was not such a startling success, but I was in a fever of excitement and anxiety over my experiments, and at the sight of the imprint of the mullein-leaf, went fairly out of my head with delight. I kept at the work all night long, trying many sorts of leaves, grass, and various combinations. The next day I went on with the experiments, and the day after, and the day after that, and at last made perfect patterns of leaves and grass. Having made the matrix, it was now the problem to make the die from it, for the tile ought to bear the pattern in relief. Fresh dust pressed upon the matrix adhered to it, and the two became one solid tile. I tried everything I could think of, and arrived at the best results by first drying the matrix, covering it with a thin coating of shellac, and pressing the dust upon that as a mold. This process was effective but far too long to be practicable, and I tried again. First I spread a thin sheet of rubber over the damp matrix, and was successful with that. This method, however, would materially increase the expense of manufacture. Next I tried fine Japanese paper, and finally came to use thin tissue-paper, as you see."

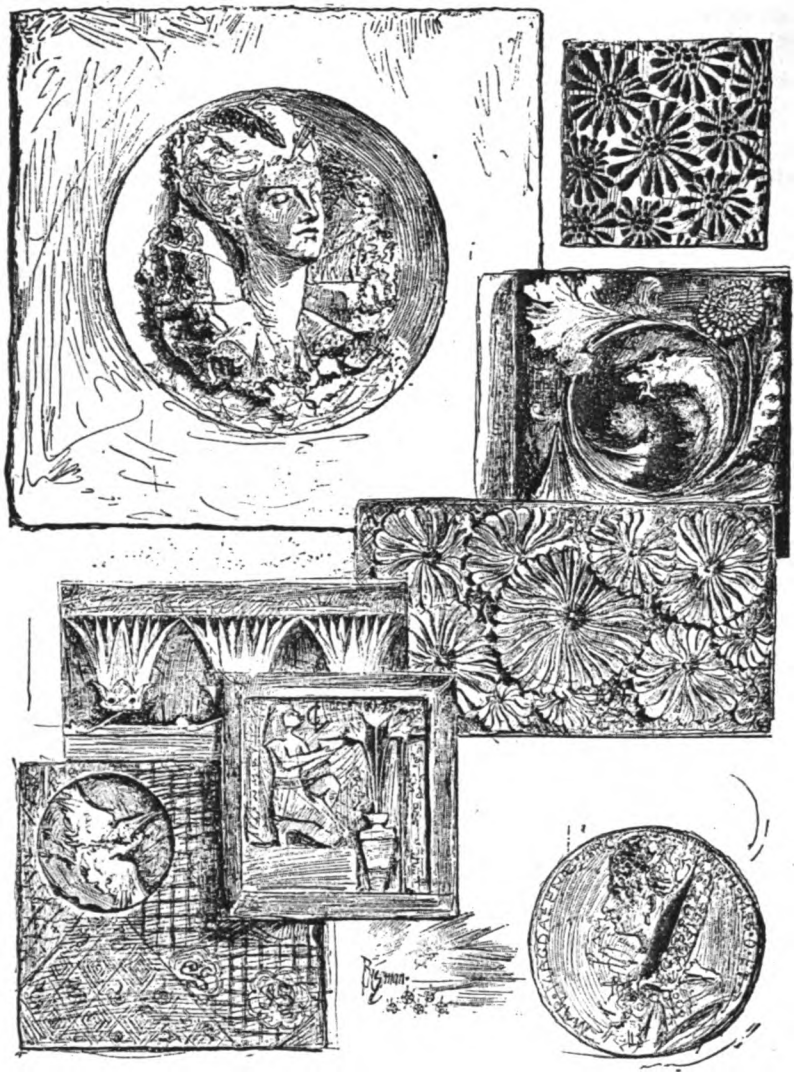
While Mr. Low was speaking, he arranged a few bits of dry grass and ferns and a scrap or two of coarse textured paper on the even surface of a tile just lightly formed in the press. He brought the screw vigorously down upon these objects, raised it again, and with the point of a penknife lifted them from the clay. A perfect impression of the objects, equal to the finest electrotype, was found in the hard surface of the tile. He then placed a square of white tissue-paper upon the tile just made, shoveled a quantity of dust upon that, and brought the screw down with a forcible turn of the heavy balance-wheel. The lever

below the bed was quickly worked after the screw had been raised, and a tile appeared, double the usual thickness, and with only a delicate line to show where the tissue-paper divided the two parts. A few gentle taps and judicious coaxing separated the two, the tissue-paper was easily removed, and there were the perfect copies, male and female, of the objects put into the press a moment before. The tissue-paper had dulled somewhat the sharpness of the details and had left its own texture, scarcely perceptible, over the whole surface, but there were the form and modeling of the leaves and the grain of the coarse paper, accurately enough reproduced to satisfy the most critical examination.

"I call these natural tiles," continued the inventor, "and the process is patented. The beauty of it is that we never make two originals exactly alike in composition, although we can glaze them with identical colors or reproduce them by mechanical means." And much quicker than the operation can be described, he made another pair of tiles from the same objects. They were as different from the first as two bunches of grass or two branches of trees are from each other.

"But you must understand," he said, "it is one thing to make tiles and quite another to sell them. During my season of experiment I had the encouragement and sympathy of the late Dr. Rimmer, the sculptor, who watched with interest every step of the work. He was the first one who appreciated the results and he confidently prophesied complete success for the tiles. I went about with my first pieces in much the same way that a young painter carries about his little first pictures, trying to find a purchaser. The things were evidently too much out of the common line to attract the commercial eye. However, Mr. Wellington, of the Household Art Company, had faith enough in his personal judgment of their merits to undertake to introduce them, and in a very short time he found a good market for them. From that moment all my doubts and anxieties were at rest. The real success was far more comprehensive than I had dared to hope, and as early as September, 1880, the tiles were awarded the gold medal at the exhibition held at Crewe, England, over all the famous pottery manufacturers of the United Kingdom."

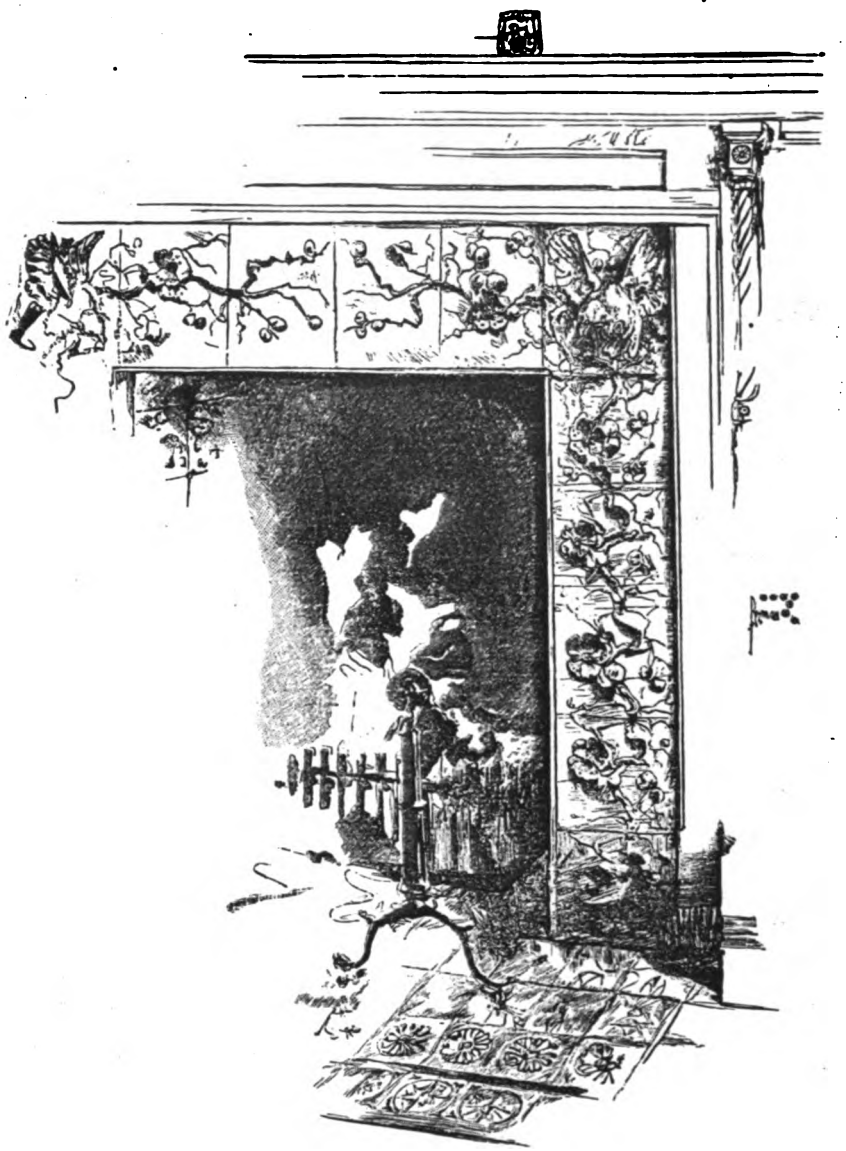
The name "dust-tile" is somewhat of a misnomer, for the clay used, though not in the form of paste, is not by any means as dry as dust, but has the consistency of damp sugar. After preliminary grinding, the different materials used in its composition are mixed with water and stirred by machinery into a homogeneous mass of the consistency of thick cream. This slip, as it is called, is then dried by artificial heat and afterward is ground into an impalpable powder. In this state it is, of course, only very slightly adhesive, and must be moistened to be worked. There is no way of mixing water with it without making it lumpy or sticky, and an ingenious process of dampening is made use of, which is not only effectual but extremely simple. A great bed of solid plaster, two or three yards square and nearly a yard deep, is sunk in the floor and surrounded by a board a foot or more in height. Upon this bed are thrown barrels of water by the bucketful until it is thoroughly wetted. The dust from the mills is then spread upon this bed in a layer three or four inches deep, and absorbs the moisture with considerable rapidity. The exact degree of



GROUP OF TILES.

dampness required can be easily regulated by withdrawing the dust at the proper time. When moistened it is ready for the press.

The natural tiles just described form only an unimportant part of the manufacture at the Low Tile Works. Relief-tiles are the specialty there, and they are quite as unique in their way as the natural tiles are. They are made mechanically by the dust process, or by hand by the ordinary wet-clay process. It will be understood that the former is the particular branch of the manufacture of relief-tiles which is the most striking and original. Before the Low tiles were made, the notable attempts at producing machine-made relief-tiles were limited to the reproduction of low reliefs in arabesque patterns. The difficulty commonly met with was in the fracture of the pressed tile when the screw was raised and the die was withdrawn from the clay; usually parts of the relief would be found sticking to the die, and frequent losses resulted. By a simple



A TILED FIRE-PLACE. (FROM A DESIGN IN USE.)

device Mr. Low has overcome this difficulty, and he now works designs in very high relief as easily as the shallow arabesques. The original designs are made in modeler's clay or wax, reproduced in plaster, and then the dies are made from these in any metal desired and finished to fit the press. When the pattern is in prominent relief, like a head, the workman has only to pile up the dust in the bed to correspond roughly with the deepest depression in the die, so as to insure the complete filling of all the parts, and then the tile can be struck with perfect ease.

The tile, when it comes from the press, is solid and heavy but exceedingly brittle, and the edges may be easily rounded by passing the thumb along them. The drying process which prepares the tiles for the kiln is an important part of

ORNAMENTED JUG.

the manufacture, and necessitates the exposure of the tiles on drying-racks, first to ordinary temperature for several days, and then to a high heat in a closed room. The greatest care is required in handling them before they are fired, and it is an operation of considerable delicacy to place them in the fire-clay boxes in which they are packed in the kiln.

The first firing, which converts the fragile, dry clay into hard, imperishable biscuit, occupies about three days. The cooling takes from five days to a week. The proper management of the kiln is, like every other part of the manufacture, the result of much experiment, and it requires a workman of long experience and good judgment to superintend the firing. The kiln itself is a conical structure, twenty feet or more in height and one-third this distance in diameter. The furnaces are built in the base of the kiln, and the flues are so arranged that, at a certain time during the firing, the smoke and gas may be turned out of the interior of the kiln, so that only the heat of the flame shall play among the "seggars" as the fire-clay boxes are called. The kiln is constructed of fire-brick laid up in concentric courses, forming a wall of sufficient thickness to confine the heat to the interior. It is entered by a small door, which is walled up after the kiln is packed. The seggars are stacked in the kiln in such a way that the fire plays among them freely, and heats every portion of their contents to the same degree.

After the biscuit has cooled, the glaze, which is a thick liquid, is applied with a brush, or the tiles are dipped into it. In firing the glaze, the heat is kept up only from twenty-four to thirty-six hours. The glaze is a mixture of various materials, so combined as to fuse together to form glass, and is colored by the addition of oxides of various metals. One of the peculiarities of the Low tiles is the strength and purity of the glazes. The colors range from pale yellows and delicate grays, through the entire scale to intense, lustrous browns and vigorous tones of green and even black. Perhaps the most successful colors are the varieties of the yellow and olive, and these are quite unlike any other tiles manufactured. The present fashion of interior decoration demands tiles which shall harmonize in color with the peculiar

tones in hangings and paint now in vogue, and to satisfy this demand Mr. Low has composed a new scale of glaze colors.

It will be readily understood, from the description of the process of making dust-tiles, that the range of design is naturally somewhat limited. Only that kind of relief can be struck which will separate from the die; that is, any portion of the relief which overhangs or is under-cut must be carved by hand after the tile comes from the press. The great value of the mechanical process is the rapidity of manufacture and the consequent cheapness of production. The hand process of making relief-tiles is necessarily somewhat slow, but it is a quite simple one, and adapted to the artistic execution of almost any design, ornamental or sculpturesque. It is no new method, having been in use, with various modifications, from the earliest times. It consists in pressing stock or clay into molds previously prepared for that purpose, and then glazing and baking the forms in the usual way. In making relief-tiles by hand there is no limit to size, except that fixed by the difficulties of firing. By this process Mr. Low has made single tiles over two feet in length. The designs are first made in clay or wax, and a plaster cast is taken, which serves as a mold for the reproduction of any number desired. This mold is so formed that the design is depressed below the general surface of the cast just the required thickness of the tile. The sides are cut off even with the border of the design, leaving the ends by which to gauge the thickness of the tile, thus giving facilities for working the clay into the pattern and for lifting the tile from the plaster. The stock is mixed in the same way as for dust-tiles, only it is taken from the drying-pan while it is yet moist enough to be plastic. A quantity of this stock is taken by the molder, and beaten and kneaded on a block of plaster, which is kept damp enough to prevent it from drawing the moisture out of the clay.

NIGHT. PLASTIC SKETCH.

When it is of the proper consistency, the workman beats it out into a thin mass, smooths the surface, lifts it with both hands, and flaps it over upon the mold, much as a cook puts pie-crust upon a plate. He then works it with his thumb into the depressions of the plaster matrix, and completes the operation by pressing the clay into every part of the design by the vigorous use of a wet sponge. The dry plaster soon absorbs the superfluous moisture from the clay, and the tile becomes sufficiently rigid to be lifted from the mold. It may now be readily worked over by cutting-tools. The pattern may be under-cut or perforated, or, indeed, elaborated to any desired degree. The drying and firing then follow, and the tile may be glazed with one color or with a combination of tints, according to the taste of the designer.

This is the process by which the Low plastic sketches are made, and it is evident from these that there is no limit to the artistic quality of this branch of tile-making other than that found in the attainments of the designer. Among scores of different designs in the plastic sketches, one of the best pieces is sheep in a pasture, with a delicately molded landscape in the distance. An owl tearing a bat is the design of one of the largest pieces, made in high relief; it measures eight and a half by twenty-four and a half inches. A cock with two hens is a highly decorative panel, and the donkey panel, showing three donkeys trotting away to meet a braying companion, is one of the most popular designs. It is a trifle longer than the owl panel.

In the tiles, a pattern of hawthorn, one of quince-blossoms, and another of apple-blossoms, are favorite examples. These are made in sets to border fireplaces of different sizes, and hearths with borders are made to accompany the sets. The designs do not stop with animals and foliage, for heads, groups of figures, and even architectural compositions are produced. A group of monks, a figure in sixteenth-century costume, and a number of ideal heads are among the latest designs successfully fired. In the plastic sketches, as well as in the tiles, the glazes are used to modify the effect of the design. They are applied so as to melt in the high heat of the kiln and flow freely over the surface of the tile, filling up the depressions, gathering in the places where shadows would naturally fall, and leaving the highest points of the relief with only a thin coating of the color. By this means the most charming effects are produced. In a landscape the foreground is strongly accented, and the sky made to appear soft and deep, as if modeled with a brush. A delicately executed head will receive through the glaze the additional charm of softness and mystery which the superimposed transparent color imparts, and the element of agreeable variety of tone will be added to the beauties of the design. All forms of pottery may be readily produced by exactly the method described above. Mr. Low has fired some beautiful examples of jugs and vases with ornaments in relief, which have all the artistic qualities of the tiles and sketches. The quantity of floor, wall, and ceiling tiles made at the Low Works testifies to the increasing demand for this material, both for decoration and for practical service. Effective ceiling tiles are made by a new process of glazing. They have the glitter of burnished gold, or the delicate variety of color and sheen of mother-of-pearl.

The measurements of tiles above given are not to be considered the limit of the size to be produced in the Low Tile Works, although they are among the largest dimensions ever reached in tile manufacture. New kilns have been built at Chelsea, and a monster press has been set up. The discouraging conditions of experimental production are no longer in the path of progress, and the expense of the costly first steps has been met. The results are before the public, and form one of the most significant features of the present artistic movement in the United States.

[From Harper's Magazine, April. 1882.]

Among other distinctly American art industries we may mention the tiles that are now manufactured at Chelsea, Massachusetts, by the Messrs. Low. These gentlemen have succeeded in giving an entirely new value to tiles, especially in regard to color and what we may call texture. By their processes tiles are not only modeled in relief, but are most beautifully graded in color, a

A CHELSEA TILE, BY THE MESSRS. LOW.

blush of a certain tone seeming to spread and deepen over the surface, and while a certain grade of color is adhered to in a number of tiles, no two are alike in the distribution of values, and the surface is apparently a thin glaze overlying a mellow molten depth. To this description of tiles has lately been added another still more effective, in which various colors are used in the same piece, and in which are seen curious crystalline formations of great brilliancy under the transparent surface. The beauties and novelties of these tiles are as impossible to convey in black-and-white illustrations as are those of the opalescent glass now so deservedly admired, and which has added a new charm and larger range to the effect of our stained glass.