MARBLE."

In architecture the word marble conveys the idea of a stone of more importance than an ordinary building material. It is a stone always possessed of some special beauty, either in texture, color, or both, and of sufficient hardness to take a polish. The varieties are almost infinite, and numerous as they are, it is rare that any two quarries are precisely the same ; there is always an individuality of some sort or other.

We have marbles of one uniform color, as white, black, gray, red, yellow, green, and so on ; but in all cases, even in whites and blacks, there are differences. The whites of Carrara, Italy, differ from those of Greece, Spain, and America. The blacks of Belgium are not the same as those of England and Ireland. The serpentines of the Lizard, Cornwall, differ from those of Banff, in Scotland, and Anglesea, and further vary from those of the Continent and America. These variations are not to be wondered at, when for a moment we study their origin and the different changes they have gone through as part of the earth's crust. Their ages are equally wide, some being, comparatively speaking, recent, while others are old, and some very old. The white crystalline marbles are now conclusively proved to be nothing more than ordinary sedimentary limestone rocks, like our chalk cliffs, or carboniferous rocks, which have gone through a process of cooking or baking under great pressure, while being hermetically sealed by overlaying rocks which have kept in the gases, causing the limestone rock to crystallize and alter its nature to that extent that rarely any of the fossils are now discernible ; in short, a new rock is produced. There are other whites that have been produced by hot springs carrying in solution a large quantity of lime and silica, which deposits directly the carbonic acid gas is liberated in the atmosphere, often producing a rock of the purest whiteness, or colored by any metal that the hot water may pass through.

Black marble is a sedimentary limestone colored by earbon, which color is immediately destroyed by heat, producing the whitest of lime oxide. We get black marbles with white veins ; these white veins are usually younger than the rock itself, being infillings of the cracks produced by different causes in the history of the rock. These remarks about black rocks apply equally to red and yellow ones.

Another class of marble, the Breccias, have gone through all sorts of nature's changes and disturbances; they are rocks that have been broken into irregular fragments, and been cemented together again by nature, and after that, in some cases have gone through a baking process and the like.

* Abstracted from an address delivered before the British Architectural Association on November 10, 1899. Nearly all our green marbles are earlier rocks that have been altered, and in some instances been broken up and recemented, like Verde Antico. The greens are nearly all magnesia, while the whites in the same mass are lime; occasionally we get both white and green in the same mass. This slight geological introduction will prove to you that, as murbles are produced under such varying conditions, the quality must be equally various, both in bardness and durability.

Again, some marbles, like the Purbeck, are not much more than tremendously compressed mud and fossils, others are only baked compressed clays. When used in damp situations these often go back to their original elements, and it further happens that a marble that behaves fairly well in Italy frequently will not stand at all with us. And there are marbles that, like building stones, have to be placed on their natural bed.

Most marbles will stand in isolated shafts, or engaged pilasters, but experience shows us that only a limited number used as slabs for wall linings can resist the moisture of a newly built wall. The destructive power of this moisture, be it hydraulic or chemical, is such that it very shortly destroys the face of many marbles; all those of a slaty or sedimentary nature, when face-bedded, go directly, for instance, the Swiss Cipollino, but if cut across the bed this stands fairly well. Then again, certain marbles, like Purbock, Emperor's Red, and Verona, which consist chiefly of flattish fossil shells, when face-bedded on damp walls become pitted with small holes, while across the bed they stand all right ; nearly all this class of fossil marble is only obtainable in thin beds, so a large slab has to be face-bedded. These same remarks apply to certain red marbles found near Carrara, which are red clays compressed and baked by the same heat that has produced the crystalline whites.

When the Greeks used marble in architecture it was always treated as an ordinary building stone, no attempt was made to save material, everything was massive, and the blocks were ground or rubbed together until the whole structure was next to homogeneous, without the aid of mortar or cement. Their columns, as you are aware, were built with thick drums; these blocks were worked roughly in the quarries, with projecting bosses on the sides, to which, most probably, were attached some wooden arms to enable the blocks to be revolved forward and backward on wooden centers, until the two faces came tegether with an almost invisible joint. When built the whole column mass was skillfully massoned into a pillar with all the Greek subtlety of diminishing entasis and delicate flutings. This work, had it not been for earthquakes, and the mvages of man, would have been perfect now.

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