Imitation Marble.

A good imitation of marble can be made, it is said, by soaking plaster of Paris in a solution of alum, bake it in an oven, and then grind it to a powder. In using, mix it with water, and to produce the clouds and veins stir in any dry color you wish. It will become hard enough to be susceptible of a polish, and will be found especially useful in mending broken marble slabs.

Safety Against Fire in Buildings.

A meeting of the Insurance and Actuarial Society of Glasgow was held on April 8, when Mr. A. B. Dansken read a paper on "Notes on Buildings."

Having given a short summary of the various building acts in England and in America, Mr. Dansken said that the London and Liverpool acts were the models for all others in England. In Scotland they had no act really worthy of the name. In Boston and Montreal, on the other hand, the acts were of a more general nature than those in this country, though they contained some excellent provisions which might with advantage be adopted here. The Metropolitan acts contained excellent structural arrangements. Liverpool had paid great attention to regulations for the storing of goods within the boundaries of the borough. while Montreal had special regulations for the erection and use of steam boilers, furnaces, stoves, and such like. Great improvement had recently taken place in the storing of goods, particularly in London and Liverpool, and what was required in Scotland was a general building act similar in its provisions to those of London and Liverpool. The most fruitful sources of fires in dwelling house property were defective hearths and vents (flues), and this was borne out by the fire returns of various cities. The percentage in Glasgow was three times greater than in London, more than double that of Liverpool, and one-fourth more than Manchester. The reason of that, says the *Architect*, was not far to seek, for the Metropoliton Building Act required that hearths "shall be solid for a thickness of seven inches at the least beneath the upper surface of such hearth or slab;" while in Glasgow not only were there no regulations as to hearths, but the practice was to lay them on the bare wood—the most dangerous that could be adopted. Considering how gables and party walls were built in Glasgow, it was not surprising to learn that a great many fires occurred from defective chimneys. In the construction of dwelling house floors Mr. Dansken referred to the present method of deafening by filling in between the joists a layer of ashes or rubbish on loose boards, and suggested that if the space between the joists was filled in with concrete the floor would be practically fireproof. A floor of that kind immediately above shops would confine a fire, or at least retard its progress very considerably, and render the dwelling houses much safer. Were that system adopted in mansion houses, there would be fewer instances of their total destruction. Having given some hints as to how to deal with lightning rods, Mr. Dansken proceeded to refer to warehouse and shop property. As the danger from fire increased proportionally with the size of the building, he thought some legal restrictions should be placed on their limits, for the extra rates charged for large warehouses had had little or no influence in that direction. Within recent years it had become the practice to have ceilings and walls of warehouses wood lined. That very largely increased the risk of fire; but it might be remedied to some extent by having asbestos felt under the wood lining of the ceilings and the space behind the lining of the walls, and filled up at intervals with belting of cement or plaster. Dealing with fireproof iron doors, Mr. Dansken referred to several varieties, but said that he preferred one formed of a combination of corrugated iron and asbestos. With respect to the mode of hinging them, he thought that where practicable the hinges should be bolted through the full thickness of the wall, and that the steps of the doors should be raised higher than the floor level on either side, to prevent liquid flowing from one floor to another. Mr. Dansken concluded by referring to different forms of floors suitable for public buildings, in which a combination of iron and concrete was treated in various ways.

J. J. Keller.

Mr. J. J. Keller, senior member of the well known chemical house of John J. Keller & Co., of this city, died recently aged 61, the victim of a mistake in the giving of medicine. As a remedy for facial neuralgia his physician prescribed, or intended to prescribe, for him a dose equal to three-quarters of a milligramme of sulphate of atropine. By some error as yet unexplained, the dose given to the sick man was three-quarters of a gramme, or one thousand times more than had been intended. The patient took the dose, became immediately unconscious, and soon after died.

Atropine is an alkaloid obtained from the belladonna plant, or deadly nightshade. It is a very active poison, but a very excellent and wonderful medicine when rightly used. It is especially employed by oculists in treating diseases of the eye, having a remarkable effect in dilating the pupil.

The Kaolin Beds of Chester County, Pa., and of New Castle County, Del.

BY GRAHAM SPENCER.

For the last fifty years the manufacture of china in this country has been steadily growing, and is now an important industry, and one that is increasing in the quantity as well as quality of its goods yearly. The first pottery in America was established in Philadelphia, about half a century ago, by a man named Tucker, who carried on the business for some time, making very excellent semi-porcelain ware. Since then, Trenton, New Jersey, is the great point of manufacture east of, and East Liverpool, Ohio, west of the Alleghanies. Besides these, Baltimore, Wheeling Steubenville, Beaver Falls, and Cincinnati, and a number of other places have one or more potteries located in them.

The great bulk of kaolin, or china clay, used in the potteries of the United States is mined in this section. The amount of prepared clay shipped last year was nearly twenty thousand tons.

Kaolin results from the decomposition of a rock composed of feldspar and quartz; and is found in pockets or beds, in low and very often swampy ground (I speak of kaolin found in this vicinity), the clay underlying the surface soil holding the water. The amount of covering varies; in some cases being less than eight feet from the surface, and in others as much as forty. The pockets are of an oblong shape, the general direction being northeast and southwest. The kaolin is found bedded against veins of talc, which determine the width of the pocket. The talc is very irregular in its pitch, but eventually cuts the clay out. The talc is in turn bedded against partly decomposed mica schist, and very often against a vein of iron or manganese.

There are no surface indications of kaolin, and it is generally proved by boring, or sinking small shafts. After having determined the position of the deposit, the dirt is stripped off and the clay uncovered, and taken out by means of carts, cars, or derricks, as the case may be. From the situation of the pit, which is generally in the lowest ground, there is no opportunity for drainage after you are down any depth, and constant pumping becomes necessary, not only of surface water, but of large springs, which burst out from the sides of the pit and through the banks.

The clay is taken from the pit to the washing machine, which is a three or four inch shaft, according to the power you have, placed horizontally with knives at right angles, about four inches apart, made of three-inch by inch iron, twelve inches long. The whole is enclosed in a stout framework, with a pulley at one end of shaft connected by belt with main shaft, and an opening made at the other end of the machine for the escape of the clay and sand. The shaft is set in motion, a stream of water turned on, and the clay thrown in the top as fast as a man can shovel it. The sand or quartz coming out with clay and water settles in a box, where it is continually being shoveled out.

The clay, combining with water, and of the thickness of cream, is allowed to run slowly off into a number of troughs for a time, until all the impurities have had a chance to settle. It is then turned into large vats, where it remains until quite thick. It is then pumped into presses, which are a number of wooden panels held together by iron rods—each panel containing a canvas bag. The water escapes through the pores of the canvas, and leaves the clay in such a condition that it can be handled and placed on shelves in the open air to dry, after which it is ready for shipment.

Kaolin, both in a crude state and washed, is much improved by exposure. If placed in piles, and allowed to freeze and thaw during the winter, it will be found much tougher in the spring. A strong, tough clay is of much more value to the potters, as it enables them to make thinner ware. It is said that in the manufacture of the finest ware, in China, one generation mines the clay for the next to use.

The average yield of washed koalin from a ton of crude clay is from thirty to fifty per cent. I have never seen crude clay in any quantity which would yield above that.

The quartz, washed from the crude clay, is of the purest nature; and when pulverized is worth about $12.00 per ton, and is sold to the potters—they using it in the body of their ware, and also with feldspar as as a glaze.

The mica or talc which is washed from the clay, and settles in the troughs, makes a good fire brick.

In conclusion, to give a general idea of the size of the deposits of kaolin in this section, I would say that in the pit I am now working, the clay had been proved at a depth of ten to sixteen feet from the surface, for over 300 feet in length and 80 to 100 feet in breadth; and in depth 50 feet, and still clay. The greatest depth I have ever been down, in any of my pits, is ninety feet, the strata of clay continuing, but which had to be abandoned on account of the expense of keeping the dirt from caving in.

The color of kaolin varies from a pure white to a yellow (as shown in the specimens), the white being more valuable. The yellow and the white clay are often found banked against each other, and running vertically downward, side by side. The clay is hard to excavate, and requires the strongest steel pointed shovel for work, being dug in sods.—*Proc. Eng. Club.*

Cements for Special Purposes.

The value of a cement is, first, that it should become a strongly cohering medium between the substances joined; and, second, that it should withstand the action of heat, or any solvent action of water or acids. Cement often fails in regard to the last consideration. For waterproof uses several mixtures are recommended, and the following may be mentioned:

One is to mix white lead, red lead, and boiled oil, together with good size, to the consistency of putty. Another is powdered resin, 1 ounce, dissolved in 10 ounces of strong ammonia; gelatine, 5 parts; solution of acid chromate of lime, 1 part. Exposing the article to sunlight is useful for some purposes. A waterproof paste cement is said to be made by adding to hot starch paste half its weight of turpentine and a small piece of alum. As a cement lining for cisterns, powdered brick 2, quicklime 2, wood ashes 2, made into a paste, with boiled oil, is recommended.

The following are cements for steam and water joints: Ground litharge, 10 pounds; plaster of Paris, 4 pounds; yellow ocher, one-half pound; red lead, 2 pounds; hemp, cut into one-half inch lengths, one-half ounce; mixed with boiled linseed oil to the consistency of putty. Whitelead, 10 parts; blackoxideof manganese, 3; litharge, 1; mixed with boiled linseed oil.

A cement for joints to resist great heat is made thus: Asbestos powder, made into a thick paste, with liquid silicate of soda.

For coating acid troughs, a mixture of 1 part pitch, 1 part resin, and 1 part plaster of Paris is melted, and is said to be a good cement coating.

Correspondents frequently ask for a good cement for fixing iron bars into stone in lieu of lead, and nothing better is known than a compound of equal parts of sulphur and pitch. A good cement for stoves and ranges is made of fireclay with a solution of silicate of soda. A glue to resist damp can be prepared with boiled linseed oil and ordinary glue; or by melting 1 pound of glue in 2 quarts of skimmed milk; shellac, 4 ounces; borax, 1 ounce, boiled in a little water, and concentrated by heat to paste. A cement to resist white heat may be usefully mentioned here: Pulverized clay, 4 parts; plumbago, 2; iron filings, free from oxide, 2; peroxide of manganese, 1; borax, one-half; sea salt, one-half; mix with water to thick paste, use immediately, and heat gradually to a nearly white heat.

Many of the cements used which are exposed to great heat fail from the expansion of one or more ingredients in them, and an unequal stress is produced; or the two substances united have unequal rates of expansibility or contractility; the chemical or galvanic action is important. The whole subject of cements has not received the attention it deserves from practical men. Only Portland cement has received anything like scientific notice, and a few experiments upon waterproof, heat-resisting, and other cements would show which cements are the best to use under certain circumstances. —*Van Nostrand's Magazine.*

A Russian Bath at Home.

Among the new home conveniences recently introduced, is a simple attachment to the ordinary bath tub, by which the luxury of a vapor or medicated bath may be taken in one's own house.

To persons who enjoy the luxury of the Russian bath, but do not reside where such establishments are accessible, the new vapor appliance is a good substitute.

The medicating or disinfecting materials are placed within cylindrical air chambers, and fed drop by drop into the water, and mingle with the steam as it is drawn into the bath tub. The invention has been introduced into some of our city hospitals, and a number of physicians have recommended it for its capability as a deodorizer and disinfecter. A bath may be perfumed by a few drops of any odorous extract, put into the cylinder with the other ingredients. Handsome rooms have been fitted up for exhibiting the practical workings of the new bath apparatus at No. 12 East 23d Street, New York, and persons residing out of the city who may desire to know more about the invention can gain information by addressing John Ponder, at the above place.

Heavy Electric Light Suits Coming.

The Edison Electric Light Company have commenced suits against alleged infringers on their patents for incandescent electric lighting on a scale which promises to give a large number of lawyers a fine field of labor. The various companies made defendants are the U. S. Electric Lighting Co., the U. S. Illuminating Co., the Consolidated Electric Light Co., the Swan Incandescent Electric Light Co., the Remington Electric Light Co., and the Schuyler Light Electric Co., besides a few prominent users, who, in patronizing these various companies, to this extent dispute the validity or force of the Edison patents.