These directions apply to ordinary privy-vaults. The best improved privy-vault known to this department is constructed by connecting a water-tight vault with the street-sewer by a discharge-pipe, which is provided with a movable plug so arranged that the vault can at all times be properly flushed when the plug is set in the discharge-pipe. The vault can be kept free from sewer-gases by means of a cap set over this plug dipping into the water in the vault. An iron grating should be provided in the vault to intercept large substances thrown therein.

By order of the Board.

CHARLES F. CHANDLER, *President.*
EMMONS CLARK, *Secretary.*

Japanese Paper.—Paper is extensively used in Japanese houses as a substitute for glass in the windows and sliding doors, and possesses not only the advantage of an immunity from breakage by the frequent earthquakes, but also occasions only a small loss when the house burns down, which happens often enough. Whatever may be its drawbacks, the use of paper for the above purpose is intimately connected with the system of house-building in Japan; and it will be long before it is entirely abandoned.

Wall papers are used in all the houses, and are manufactured, not in rolls, but in small sheets ornamented with all kinds of designs printed from wooden blocks, on which the pattern has been cut in relief. The colors having been mixed with some thickening paste, are applied to the block, either by means of a brush or by tamping, after which the paper sheet is laid on the block and rubbed with a flat rubber lined with the smooth bud-scales of bamboo, and used like a printer's ball. Very fine white mica powder is applied to the wall paper, and produces a metallic lustre resembling silver.

The crape-paper, which is a most perfect imitation of the real crape, is made by a very ingenious and most simple process. In the first place, that which may be called the matrix-paper is prepared by laying a moistened sheet of strong paper on a wooden board cut with fine grooves, running either parallel or crossing one another at very small angles, and by beating it with hard brushes, so as to force it into these grooves. It is then painted over with "shibu," in consequence of which operation the paper becomes so elastic that, when let go, after having been stretched out, it refolds by itself. For the production of crape several sheets of thin moistened paper are laid, alternately with sheets of the above-mentioned matrix-paper, one upon the other. The package is then wound on to a round piece of wood, and pressed several times with a strong lever, as if it were to be stripped off from this piece of wood. By means of this operation, the soft and moistened paper is forced into the folds of the matrix, and consequently folded in a similar manner. By repeating this manipulation ten or twelve times, each time unrolling it in order to change the position of the paper between the sheets of matrix-paper and by winding it again on the piece of wood, the paper becomes gradually folded in all directions, the intersecting points of all these folds producing the craped surface. Naturally, this process causes the paper to shrink considerably. This kind of craping is done with printed pictures, and also with colored papers, which are used for coiffures.

The paper imitations of leather are made in the same manner, but of stronger paper. After it has been craped, it is beaten with hard brushes into the moulds which produce the relief patterns; and these designs are afterwards painted as required with the help of "shibu," or the "Ye-no-abura," and lacquer.

Paper is also often used as a substitute for cloth, for umbrellas, rain-coats, etc., and even for dress cloth, "Shibu" and the "Ye-no-abura" are the means employed for rendering the paper waterproof. This cloth is generally made of paper alone, by beating it to make it soft, and impregnating it with gummy substances, to make it more resistant to the action of water. Another kind of cloth, called "shibu," consists of silk warp and paper woof. The paper is cut into fine strips twisted together into threads, and spooled for weaving. Paper strings, of great regularity, great strength and prettily colored, are made in a similar manner, and were formerly used in large quantities for tying up the hair. They are now only used for tying presents and other small parcels. [*Paper Trade Jour.*, vi, 21.]

Earlier Appliances in the Production of Iron.—At Greenock there is a large piece of cast-iron ordnance which is said to have been recovered from one of the wrecks of the Spanish Armada; and if this is an authentic account of its origin, and supposing it to have been manufactured in Spain, it proves the existence of appliances in that country which must have subsequently disappeared. Nearly fifty years previous to the time of the Spanish Armada, about 1543, a certain Ralph Hoge, or Hogge, of Bucksteed, in Sussex, had acquired great reputation for the manufacture of cast-iron ordnance; and "this founder," it is stated, "employed as his assistant Peter Baude, a Frenchman, whom he had probably brought over to teach him the improved method," whatever that may have been. Not long after, a covenanted servant of the Frenchman, John Johnson, excelled his master in the art of casting ordnance; and his son Thomas, in 1595, succeeded in casting 42 pieces for the Earl of Cumberland weighing 6000 lbs., or about three tons apiece. There is no record either of the exact period when the earlier blast bloomary developed into the blast furnace, and it is quite possible that the one had no material influence upon the development of the other, as the earlier apparatus produced little, if any thing, but malleable iron, and the blast furnace was exclusively employed for the production of castings. It is certain, however, that the fuel employed up to the middle of the eighteenth century was charcoal only, and that it was the rapid falling off in the supplies of timber that led to the almost total extinction of the industry, which, in the reign of Queen Elizabeth, had risen to the importance of a great export trade. Special enactments had to be enforced for the preservation of the forests; and the production of iron, which had risen toward the end of the seventeenth century to 180,000 tons, was reduced in 1740 to 17,000 tons. It was this pressure, arising from the scarcity of fuel, that became the mother of the recent discoveries and inventions in connection with the iron industries of this country. There is something inexpressibly sad in the biographies of many of the men who were the pioneers of these improvements. They frequently fell victims to the prejudice and ignorance of commercial Philistines, who looked upon their genius as madness and their improvements as impracticable.—*From "Great Industries of Great Britain."*

Bituminous Substances in Granite.—M. A. Julien communicates to the French Academy the fact of the occurrence of bituminous veins in granite in the neighborhood of Clermont-Ferrand. They were observed in a railroad cutting between Royat les Bains and Votria. The bituminous substance is occasionally black and soft, but oftener a species of dark-brown asphaltum with conchoidal fracture, which gives off in burning the characteristic odor of that substance. The veins vary in thickness from a few millimeters to 3 centimeters in diameter. So far as we are apprised, this occurrence is unique.

Another New Explosive has been devised by Prof. Emerson Reynolds, of Dublin, who lately presented a description thereof to the Royal Dublin Society. It is composed of a mixture of 75 per cent of chlorate of potassium, and 25 per cent of a substance named by the inventor "Sulphurea." When mixed as above described, the compound is a white powder, igniting at somewhat lower temperature than gunpowder, but possessing considerably greater explosive effects, and producing less of solid residuum. The new explosive, it is affirmed, has been successfully used in small cannons, but the inventor deems that its chief utility will be found in its applications to blasting, and for shells, torpedoes, and the like.

The new explosive is claimed to have, besides, the additional advantages that it can readily be made as it is wanted, requiring no skill whatever, aside from observing the proper proportions of the ingredients, while these last are quite harmless so long as they are kept apart.

"Sulphurea," we are further told, was discovered by Prof. Reynolds some ten years ago, and can be produced in any desired quantity from one of the waste products of the coal-gas works.