models to make other eyes by. The enamel eye, after being exposed to the action of the atmosphere for some months, loses alike its color and its luster, and becomes opaque-looking; a thick, dingy coating of solidified humors spreads over its polished surface, and it has a glassy look, like the eye of a dead person. "Touch them, you will do no harm," says the oculist to visitors, just as though it was a collection of coins or minerals they were inspecting.

ENAMELING WOOD WORK.

[From The Building News.]

We have very considerable doubts as to whether polished paint may be considered in good taste when used for the interiors of drawing rooms, or, in fact, of any room. There is a want of repose, and a garishness about gloss colors, which are scarcely compatible with that quietness and repose so necessary to the perfect satisfaction of the educated eye. Polished glass is beautiful, and never out of place; the same may be said of marble, of gems, and of all steel work or instruments. With all these, polish is the one thing needful to develope their beauty and finish, and, in fact, is a necessity of the material. This is so self-evident that we never for a moment doubt its propriety or imagine it would be better otherwise. Fitness, beauty, and utility are a consequence of the polish in all these cases, and therefor proper and right from every point of view; but the same reasoning will not apply to polished paint, that is to say, plain tints of colors. Of course, imitations of woods and marbles may be polished with propriety and without offense to good taste, simply because we expect to see them so, and they would not be finished if left unvarnished and unpolished. But it is otherwise with plain colors, which, when glossy, have too much the look of the japanner's shop or the tea tray business. These remarks apply principally to that so-called enamel work which is produced by merely painting the work and finishing it with varnish, when, as a matter of course, it very soon becomes discolored; and even when first done it is a mistake in name and execution, and a gross offense against good taste. The best enamel work—of which there is but little done in consequence of its great cost—is free, in some measure, from the objections urged against the common work. Its manipulation requires so much patience and care that it is a very difficult matter to find men who have the qualifications requisite for preparing such fine work, and therefore it is very rare to see a really good job. In getting up enamel work, much care is requisite in the selection and use of the material required. The filling-up color, which forms the body of the enamel, is of the greatest importance to the ultimate success of the work. Of this material there are several kinds manufactured—black, brown, and yellow, for coach painters, japanners, and others; but for use in interior decoration we prefer to use the white lead filling, as we can, by adding the necessary staining colors (which do not affect the properties of the enamel), form a solid body of color of the same tint, or nearly so, as that with which the work is required to be finished, and thus do away with the objections which may be urged against the black or dark-colored filling. For it will be evident to the plainest comprehension that if work which has to be finished white, or with very light tints of color, be filled up with dark-colored fill ing, that the number of coats of paint which will be required to obscure or kill the dark color will be so many that there will be danger of the work becoming rough and uneven in parts—at all events there can be no question that work which is left with a smooth, even surface, produced by rubbing alone, must be much finer in texture than any that can possibly be left by the brush. The white lead should be ground stiff in turpentine, and about one fourth part of the ordinary white lead, ground in oil, added to it, in order to prevent the enamel cracking, which it has a tendency to do, except there be some little oil mixed with it. A sufficient quantity of polishing copal or best carriage varnish should now be added to bind it so that it will rub down easily, which fact cannot be properly ascertained except by actual trial, inasmuch as the drying properties of varnishes vary, and other causes influence the matter. If there be too much varnish in the stuff the work will be exceedingly difficult to cut down, and if too little, it is apt to break up in rubbing, so that it is always the safest plan to try the enamel color before commencing anything important. The color, being properly mixed, should be laid on the work in the ordinary manner, using it rather freely. It may be as well to state here that no filling should be put upon new work without the same having had two or three coats of ordinary oil paint, nor on old work without its having one coat. This gives a key for the filling to bind to. Successive coats of the filling should now be laid on the work until there is a sufficient thickness to cut down to a level surface, filling up the whole of the indentations and undulations of the panel. One day should intervene between each coat, in order to allow it to harden in some degree. When a sufficient number of coats is put on (which number will, of course, depend upon the state of the work to be filled up), it should stand for a fortnight or three weeks, until it is thoroughly hard; it will then be ready for cutting down, which is to be done with felt, ground pumice stone, and water. The felt used should be such as the marble masons use for polishing marble, which varies in thickness from one eighth to half an inch, and about three inches square. This should be fastened by the aid of patent knotting or other resinous gum, to square pieces of wood of the same size, but one inch thick, so as to give a good hold for the hand in using. These pieces of wood, covered with felt, may be made of any size or shape, to fit molded surfaces or other inequalities. The pumice-stone to be used should be of different degrees of fineness, and should be carefully selected, so as to be sure that it is free from any foreign substance. It is sold ready ground, but in situations where it cannot be conveniently got, it may be prepared from the lump, by grinding or crushing with a stone and muller, and then passed through fine sieves or muslin; by using these of different degrees of texture the ground pumice may be produced of different degrees of fineness. Except great care be exercised in this matter, it will be found that particles of grit will be mixed with it, which in using, get on to the work, and make deep scratches, thus causing endless trouble and annoyance, besides spoiling the work. The greatest care is also required in keeping the felt clean and free from grit. Many workmen are careless in this matter, and when working set down the felt on the step-ladder or floor, and thus particles of sand or grit get upon it, and so mischief is done.

In cutting down, it is best to use a piece of soft lump pumice stone to take off the rough parts. The felt and ground pumice should now be used with water, the work should be wet with a sponge, and the felt soaked in water, and then into the powdered pumice, and the work rubbed with it, keeping it moderately wet, and rubbing with a circular motion, and not straight up and down and across, with a light touch, using only just as much pressure as will cause the pumice to bite, which will be very clearly felt while the hand is in motion. Much care and patience is required to do this properly, for if the pressure be too great it forces the pumice into the body of the filling color, and scratches it instead of cutting or grinding it fairly down. No hurry will avail in doing this work, it must have its time; hurry only defeats the end in view, and often causes much unnecessary labor. A scratch, caused by want of care and too much haste, will often throw the work back for days, and involve the cost and labor of refilling. We find in practice that the purpose is best answered by using the pumice stone, the coarser kind first, then the medium, and finishing with the finest last. It will be found advantageous to let a day elapse between the rubbing, for when the surface is cut down the filling will in all cases be softer underneath, and if it be allowed to stand for a day, the newly exposed surface gets harder, and of course rubs down better in consequence. The pumice stone should be well washed off the work occasionally, in order that we may see what progress is being made, and if it require more rubbing or not. If, while in progress, it be found not to be sufficiently filled up, it may have one or more coats of filling after it has been roughly cut down, and before much labor has been spent upon it.

When sufficiently rubbed down with the pumice stone—that is to say, when it has been cut down to a fine, level, and uniform surface, the work should stand for a day or two to harden. It will now depend entirely upon the work, as to whether it must be polished upon the filling, or whether it will have to be varnished and polished. If the filling be of the right color, and has rubbed down of one uniform tint, we prefer it to be finished in this state, because, in the first place, it will have a surface and texture which cannot be got by any other means. Finished in this state there is an absence of that glare-polish—if we may use the term—which is inseparable from varnish polish. It has all the uniformity of surface and evidence of finish, without that appearance of varnish which is so objectionable, and therefore we prefer it to any varnish polish. After it has stood a day or two, the work, if it be intended to be left in the state we have been speaking about, must be polished in this wise: Take a clean felt and rotten stone, either in oil or water, and with this rub the work as before, until the polish begins to appear; then take a boss (*i. e.* a ball of cotton wool inclosed in fine silk), put the rotten stone upon this and keep rubbing with the circular motion until the polish is uniform and equal all over. The rottenstone must now be carefully cleaned off; if it be in oil, clean off with fine flour; if in water, with sponge and wash leather and water, taking care not to scratch. A clean damp chamois or wash leather will now be required, which must be held in the left hand, leaving the right perfectly clear. Now use the ball of the right hand, press gently upon the panel, and draw it forwards or towards you. If this be done properly, it will bring up a clear polish upon the work. The hand should be kept slightly damp by drawing it across the leather almost every time the hand is drawn forward. If this be done effectually, a rustling sound will be produced while the hand is in motion; if this be so, the polish will be sure to follow. The polish thus produced on the filling alone will be of the kind we have spoken of above, and will not be at all objectionable to even the most fastidious taste; but if the work has to be finished with a brilliant luster and to a high degree of polish, it will, after being cut down with the pumice and felt, have to be coated with two or more coats of the best polishing copal varnish, having a quantity of the best flake white from the tube; this should be mixed with the varnish in sufficient quantity to form a creamy mixture, with which the work must be coated—one, two, or three coats, as may be desirable. This should stand for three or four weeks, until it becomes hard, for the harder it is, the better it will polish. It must then be cut down with felt and the finest ground pumice stone in water, and polished with the rotten stone, as before described. By this means a bright and brilliant polish may be obtained, of a very enduring nature. The same process will of course answer for all varnished imitations of woods and marbles, and all work which will admit of the application of oil varnishes.

IN Philadelphia there is a small blacksmith's shop, the bellows of which is operated by dogs. The bellows is connected with a wooden wheel box, which is kept revolving by the motion of the dog, something after the manner of a treadmill.

Birmingham Bell-Making.

In medieval times it was accounted a less difficult matter to cast a church bell than to convey it any long distance from the foundery to the steeple; and it was a common practice to cast these cumbrous articles in the immediate neighborhood of the church or cathedral in which they were intended to be hung. So late, indeed, as the year 1762, the great clock bell at Canterbury was re-cast in the cathedral yard. The early bell-founders were consequently an itinerant fraternity, roving through the length and breadth of the country, but seldom failing to pitch their tent in or near some cathedral town. That they were well skilled in their craft the Sunday chimes in many an antique temple bear ample witness, and a leading bell-founder of the present day does them the justice to remark: "One law of nature, indeed, they were acquainted with, which modern bell-founders in too many cases ignore—that a given weight of bell metal can only sound a very narrow range of notes with good effect, and that if bells are cast thinner to produce deeper notes, the quality of tone must suffer."

The commencement of bell founding as a staple of Birmingham industry appears to have dated from the middle of the last century. It is at least recorded in the local annals that "a foundery opposite the Swan at Good Knaves' End" supplied a peal of bells to Harborne and two other neighboring churches, about the year 1760. "Chimes" were cast at another foundery twenty years later, but from that time down to a very recent period the production of church bells became an obsolete industry in the "hardware village." Within the last half dozen years, however, Messrs. Blews and Sons have successfully revived the trade, and Birmingham bells promise to become as famous in the future as they have been in the past—thanks to the liberal and progressive enterprise of this well known firm.

Let us now describe the process of casting a peal of bells, as recently witnessed at the establishment referred to. The peal comprised six large bells for a church in New South Wales, which were cast in the same pit with three other bells for Mexico, the weight of the entire casting being about three and a half tuns. Bell metal is compounded of three parts of copper to one of tin, this proportion giving the greatest density of metal. Mr. Blews is, however, of opinion that the true chemical combination would be six atoms of copper to one in tin, or in weight three and one fourth to one. A less quantity of metal than is due to the caliber of the bell, though giving the same note, produces a meager, harsh sound; consequently, the superior dignity of tone in some old bells is ascribed to a greater weight of metal being allowed for the same note than would accord with modern ideas of economic production. Four tuns of bell metal is seething at a white heat in the furnace when the process of casting commences. At a given signal, an aperture at the end of the furnace, which had been stopped with fire clay, is opened by a workman armed with a long tamping bar, and the white fluid flows along channels of sand to the pit containing the molds.

There are two ways, Mr. Blew tells us, of making bell molds. The core in both cases is made of a brickwork or cast-iron cone, covered with molding clay, "swept" into the shape of the interior of the bell by a wooden "crook" fixed to a spindle set up in the middle of the core. The advantage of an iron core is that it can be lifted into a furnace to dry, instead of being dried by the application of internal heat, as is necessary in the case of the brickwork core.

The old method is to make a clay bell on the core by means of another crook, and when this is dry, to make the outside mold on the top of it. This mold has hair and hay bands, or (in large castings) bands of iron intersected to make it hold together, and lift off when dry. The clay bell is then knocked to pieces, the mold dropped down again over the core, and weighted with earth in the pit in which the bell is cast. The metal is then poured in at one hole at the top, another aperture being left for the escape of air. In the newer process no clay bell is made. The mold is an iron case lined with clay, and swept out internally to the outside shape of the bell. The "wires," or ornamental rings round the bell, are made in both cases by the second sweep, the letters and devices being stamped in the soft clay. These iron copes can be bolted down to a plate under the core, and need not, therefore, be sunk so deep in the ground, if sufficient care be taken to get an adequate "head" of metal above the bell, which is a very essential consideration. The process of casting in the case under review occupied about ten minutes, but a couple of days at the least would be required for cooling. The tenor bell of the peal for New South Wales had a happily chosen legend: "We sing the Lord's song in a strange land."

Church, school, plantation, factory, and ship bells, still closely adhere to the medieval type, and they vary in weight from fifty-six pounds upward. Other descriptions of bells are made very largely in Birmingham, by a goodly number of bell founders. Railway and dinner bells, from four to seven inches wide at the mouth, with wooden handles attached, musical hand bells for village ringing clubs, cattle, horse and sheep bells, with the ordinary house bells, are among the principal varieties, and the number produced is simply prodigious.

Some curiosities in bells are reported by the manufacturers, of which a few may be briefly noticed. Tiny house bells, ¾ in. to 1½ in., are largely made for the African market, where they are used for purposes of barter. Sleigh, dray, and caparison bells—which are small circular articles, with an iron ball cast inside—are extensively produced for Canada and the East India market. An order was not long since executed for 10,000 green, bronzed, and lacquered house bells, which now adorn the iron palace of a West African prince.

Another potentate of ebony hue ordered a number of polished ship bells in elegant brass frames, and mounted on mahogany stands, engraved with the assumed name of the sable prince, "Yellow Duke, Esq." The number of workpeople directly engaged in this branch of Birmingham industry, is estimated at about two hundred and fifty, and the increasing use of bells, both for outdoor and indoor purposes, promises to augment the number at no distant date.—*Mechanics' Magazine.*

A NEW STONE.

Architects have for some years past been indebted to Mr. Frederick Ransome for providing them with a constructive material of very great value, a stone which can be molded into any form, which can be produced in blocks of any size, and which, when made, is as durable as the best kind of natural stone known. The production of this material—the "patent concrete stone" as it is termed by Mr. Ransome—was the result of many years of persevering labor and struggles against difficulties; but we now find that Mr. Ransome, not content with what he had already accomplished, has succeeded in producing another new stone, which is in many respects as superior to its predecessor as the latter was to all other artificial stones produced before or since.

Before describing the process by which this new stone is made, it may be desirable that we should recall to the minds of our readers the method of manufacturing the artificial stone generally known by Mr. Ransome's name, as this will enable us to speak of the steps which led to the production of the new material. The ordinary "Ransome stone," then, is composed of particles of sand, mixed, in some cases, with a little ground carbonate of lime, the whole being incorporated into a solid mass by the formation in the interstices of a silicate of lime. After many fruitless searches after a method of procuring silicate of soda on a commercial scale, and at a moderate cost, Mr. Ransome hit upon the plan of boiling flints in a solution of caustic soda *under steam pressure*, and it is the silicate of soda thus obtained that Mr. Ransome employs to bring the materials we have mentioned into a plastic state, in which they can be molded to any desired form. This being done, the block produced is treated with a solution of chloride of calcium, when a double decomposition takes place, the silicic acid and the oxygen of the silicate of soda combining with the calcium of the chloride of calcium, and thus forming silicate of lime, while the sodium unites with the chlorine of the chloride of calcium, thus forming chloride of sodium. The silicate of lime produced in this way unites the particles of sand, etc., into a hard and perfectly durable mass, while the chloride of calcium remains diffused throughout the block, and has to be removed by washing.

Now, regarded from a manufacturing point of view, this washing process is rather a nuisance, particularly where large blocks are being made. If performed thoroughly, it occupies very considerable time, and, consequently, delays the turning out of the work; while, if not performed properly, there eventually takes place a greater or less efflorescence of the chloride of sodium, which, although not affecting the strength or durability of the stone, spoils its appearance. Under these circumstances, Mr. Ransome was led to endeavor to so modify his process as to render this final washing unnecessary, or, at all events, to reduce its amount, and, step by step, he arrived at the new method of manufacture, which we shall now describe. In carrying out these new plans, Mr. Ransome makes a mixture of certain proportions of ordinary sand, Portland cement, ground carbonate of lime, and some silica, readily soluble in caustic soda at ordinary temperatures, such, for instance, as the stone found in the neighborhood of Farnham and other places, and these materials he makes into a plastic mass by the addition of the silicate of soda already mentioned. The mass thus formed remains plastic a sufficient length of time to allow of its being rammed readily into molds of any desired form; but it gradually hardens, and ultimately becomes thoroughly indurated, and converted without any further treatment, into a hard stone, capable of resisting heat and cold, perfectly impermeable to moisture, and which, as far as can be judged from the experience hitherto obtained, goes on increasing in hardness, and bids fair to be thoroughly durable.

The chemical actions by which this wonderful result is produced are very curious, and Mr. Ransome's explanation of them is as follows: The Portland cement consists, as is well known, of silicate of alumina and lime; and when the materials are mixed up with the silicate of soda, the latter is decomposed, the silicic acid combining with the lime of the Portland cement, and forming silicate of lime and alumina, while caustic soda is set free. This caustic soda, however, immediately seizes upon the soluble silica, which constitutes one of the ingredients, and thus forms a fresh supply of silicate of soda, which is in its turn decomposed by a further quantity of the lime in the Portland cement, and so on. If each decomposition of silicate of soda resulted in the setting free of the whole of the caustic soda, the processes we have mentioned would go on as long as there was any soluble silica present with which the caustic soda could combine, or until there ceased to be any uncombined lime to decompose the silicate of soda produced, the termination of the action being marked by the presence in the pores of the stone of the excess of caustic soda in the one case, or of silicate of soda in the other. In reality, however, the whole of the caustic soda does not appear to be set free each time the silicate of soda is decomposed by the lime, there appearing to be formed a compound silicate of lime and soda, a small portion of the latter being fixed at each decomposition. The result thus is that the caustic soda is gradually all fixed, and none remains to be removed by washing or other process.

By his new process Mr. Ransome is enabled to produce admirable artificial marbles, while, by introducing amongst the materials fragments of quartz and a small proportion of oxide of iron, he obtains a stone of rich color, and hardly distinguishable from Peterhead granite. Like the natural granites and marbles, the artificial substitutes are capable of taking an excellent polish, while they possess the great advantage over the natural products of being capable of being molded in the course of manufacture into any form at a trifling cost. It would be idle for us to attempt here to enumerate the uses to which the new stone can be applied, for they are practically numberless. For decorative purposes it will be invaluable, and Mr. Ransome deserves the best thanks of architects, and we may add, of engineers, also, for having furnished them with a new constructive material at once so cheap and good.—*Engineering.*

Boiler Explosions.

The explosion of a steam boiler is *primâ facie* evidence of carelessness in its construction, or in its maintenance, or in its use. It is so regarded by the engineers, and ought so to be regarded by the law. It will be easy to convince any one who will examine the records of boiler explosions and inquire into the means of preventing them, that no injustice would be done to the owners of boilers by indicting them for criminal carelessness in all cases of explosion.

The history of boiler explosions is authentic and definite. The boiler has usually been erected under the full light of modern science. All the attending circumstances of the explosion have been immediately communicated to the public; curiosity has aided science in making every man an investigator of these circumstances and a searcher after causes; public and private commissions have been appointed to examine the subject generally; numerous legal tribunals have gone to the bottom of special cases, and innumerable private professional observers have witnessed results, searched records, weighed evidence, and arrived at general conclusions. All the plausible theories of explosions have been not only looked into, but worked out, in many cases, experimentally or theoretically, to their ultimate limits.

Now the remarkable and unprecedented result of all this investigation is, not the division of any large body of experts into schools; not the building up of rival theories, but the universal conviction of all concerned, that boiler explosions are certainly in most, and probably in all cases, the result of malconstruction or maltreatment, and of nothing else, and that the usual immediate cause is the unchecked deterioration of the boiler in service. In the great majority of cases the evidences of carelessness are as plain as the time of day on the face of a clock—a sheet furrowed nearly through; a stay-bolt rusted off; a crown-sheet insufficiently supported; expansion and contraction unprovided for; water connections stopped up; bad material—some one of the many obvious and certain conditions of rupture. In a few cases the immediate causes are not apparent, and then the electricity theorists, and the gas people, and the mystery men fight over the remains in the newspapers; and the only reason why simple neglect is not discovered to be the cause, is that the parts of the boiler which would otherwise reveal it, are blown away, or are too much mutilated or obstructed to be legible. Simple bad treatment by the maker or user will account for the original rupture which ends in any explosion, however terrific may be its effects. There is force enough restrained within every steam boiler running today to perform the most terrible work of ruin that any similar boiler ever performed in exploding. When this force is once released, the amount of destruction depends on the point of rupture, the resistance, the surroundings, and on an infinite number of circumstances, mostly outside of our control. The only thing we can do, and it is enough, is to keep the resistance superior to the normal pressure.

Now that the causes of boiler explosions are so well understood as to be a matter of commercial calculation—where companies make money by insuring such boilers as are constructed and maintained according to established professional rules—it is to be regretted that the Government should stand helplessly by, and see scores of people scalded to death every few weeks, for the want of an adequate law and a system of inspection. Boiler insurance and inspection companies—and they are no new or experimental thing—simply prove that boilers constructed and maintained according to certain well known rules, are practically safe; that the chances of explosion, even with ordinary water-tending, are very remote, and they stake their money on this knowledge; and yet the United States Government has been unable to even check the increase of these disasters. If Congress cannot at once provide for the security of the public against boiler explosions, it had better let out the job of protecting its citizens to some insurance company, and then it will be done on scientific principles, and by competent men.—*N. Y. Times.*

The Domestic Silk Trade.

The interruption to the Lyons silk manufactories, naturally resulting from the Franco-Prussian war, has proved, according to the *Chicago Bureau*, of very material benefit to the producers of silk fabrics in this country. The sales of the principal makes of American silks have, we are informed, increased fully 100 per cent since the outbreak of the foreign war. Our manufacturers were competing successfully with foreigners in the production of colored silks, while the trade, though taking all the black goods manufactured here, manifested a decided preference for those of foreign make. The war has had the effect of increasing the demand for both black and colored domestic silks, though this is more noticeable in the former. Another result of the foreign disturbances—a result equally gratifying and unexpected—is the decline in the price of American goods. It seemed natural to believe, at the beginning of the war, that the inevitable result would be an advance in prices, consequent upon the increased demand and in sympathy with a rise in foreign goods. This, however, has not been the fact. Our manufacturers, like their Lyons competitors, always depended chiefly upon Italy and France for their raw silk, the California production not having become sufficiently well developed to furnish a supply anything like adequate to their demands. Now that the Lyons manufacturers are forced, by reason of the war, to suspend operations to a great extent, the Italian and French growers, especially the former, are looking to America for buyers of their staple, and finding our dealers ready to buy for cash, their desire to realize quickly induces them to make liberal concessions from current prices, which are, in fact, no higher than before the war. To this we owe—what must have been remarked by every silk buyer—the fact that American silks are now selling at lower prices than when brought into more active competition with the products of the principal silk-manufacturing districts of the world.

Extract from the Diary of Isambard Kingdom Brunel, in 1835.

53 Parliament street, Dec. 30.

What a blank in my journal (the last entry is dated January, 1834), and during the most eventful part of my life! When last I wrote in this book I was just emerging from obscurity. I had been toiling most unprofitably at numerous things: unprofitably, at least, at the moment. The railway was certainly being thought of, but still being uncertain. What a change! The railway is now in progress. I am the engineer to the finest work in England. A handsome salary, on excellent terms with my directors, and all going smoothly. But what a fight we have had, and how near defeat, and what a ruinous defeat it would have been! It is like looking back upon a fearful pass; but we have succeeded.

And it is not this alone, but everything I have been engaged in has been successful. Clifton Bridge, my first child, my darling, is actually going on; recommenced work last Monday—glorious!! [Here follows a list of the undertakings in which he was then engaged.] I think this forms a pretty list of real sound professional work, unsought for on my part, that is, given to me fairly by the respective parties—all, except the Wear Docks, resulting from the Clifton Bridge, which I fought hard for, and gained only by persevering struggles. . . . And this at the age of twenty-nine. I really can hardly believe it when I think of it. I am just leaving 53 Parliament street, where I may say I have just made my fortune, or rather the foundation of it, and I have taken 18 Duke street.

Remarkable Cave in Thomas County, Georgia.

We find the following interesting account in the Thomasville *Enterprise:*

Near the line of Brooks and Thomas counties, there has long been known an opening or cave in the earth, called "Devil's Hopper." Many persons residing in the neighborhood had visited it, but not one of these attempted a real exploration. We have before us, however, a letter written two months ago by a young gentleman in this city, to his father, describing an exploration of this cave by himself and a physician friend of his, residing in Boston. The writer says it was the most beautiful place he ever saw in his life, and he would not have missed seeing it on any account. He says that, after creeping through a narrow entrance at the surface, they descended to the depth of two hundred feet, winding about in the narrow path walled with solid flint rock, until they came to a well, which they descended by means of a rope, and found it to be forty-five feet deep, without water. At the bottom of this well they found the narrow passage leading off from the first, in a tortuous course, still walled with flint rock; they continued to follow it, and at some distance from the wall entered a large room or hall, walled with the same impenetrable flint rock, but jagged and pointed in a thousand fantastic shapes. The writer declares his inability to describe the grandeur and beauty of this hall by torchlight, but says he found himself in a large room walled with flint rock so jagged that a fall against it would cut one to pieces, and beautifully hung with stalactites that reflected the light in a thousand forms and sparkled with diamond brilliancy in the nooks and corners of the hall.

Manufacture of Glycerin in Cincinnati.

In Cincinnati, two million hogs are annually slaughtered for pork, bacon, and lard. The average weight of the heavier animals is 400 pounds. In former years, the chief attention was bestowed upon the manufacture of stearin candles and soap grease, in addition to salting and smoking meats, but latterly, since the demand for glycerin has called it into notice, more attention has been given to its preservation. For this purpose the lard is treated with water at 662° to 720° Fah., by which the glycerin is separated from the fatty acids, and freed from the disagreeable odor that characterizes glycerin made in the process of soap manufacture. Two or three large establishments manufacture annually 500,000 pounds, valued at $200,000 for the crude article. As there is an average of one hog to each individual in the United States (nothing personal intended), the forty million porkers can supply us with all the glycerin we are likely to want for an unlimited amount of artificial champagne, doctored cider, and rectified beer, not to speak of sirups and candy.

The Public Printing Office, in Washington, is to be connected with the Capitol, by telegraph, and a pneumatic tube is talked of for carrying messages, proofs, etc.