(Our Foreign Correspondence.)

Venetian Glass.—How they make Beads.

VENICE, Italy, April, 1856.

Venetian glass has a world-wide reputation, and since I have been here, I have spent some time in endeavoring to discover the reason why glass, manufactured in this city, should be any better than that produced elsewhere. As yet, I have not ascertained anything satisfactory, but conclude it is principally the colors introduced that give to this glass the name and fame it has hitherto enjoyed. From a gentleman well acquainted with the glass trade, I learned that all the fine white crystal glass, used for decanters and table service, is imported into Venice from France and England, and that very little of the glass made here would compare with the manufactures of Germany and France.

Continuing my researches, I took an early opportunity of visiting some of the glass-works hereabouts, where the articles produced were beads, bugles, fancy plates, bottles, cups, saucers, &c., beautifully colored but wanting in clearness, full of blemishes and air bubbles. The plate glass works employ only a few hundred men, and turn out an article thicker and superior to our ordinary window glass, but of a yellowish tint, denoting anything but real excellence. The great renown that Venice has obtained for glass works is chiefly owing to the immense number of beads manufactured in its establishments. Having visited all the large factories here, I will endeavor to describe to you the process.

The materials are put into smaller furnaces than those used in America, but constructed upon the same principle, with contrivances for economising fuel, for which the Italians generally are celebrated. When the mass is sufficiently fused, the coloring pigment is thrown in, and mixed with the molten glass. When thoroughly amalgamated, the workman gathers a couple of pounds of the melted matter upon the end of an iron rod, which he withdraws from the furnace and manipulates upon an iron slab; after this, he plunges the glass into a tub of water. When it is sufficiently cooled, he sticks it into the furnace again, where it remains until once more melted, then it is taken out and fashioned into a shape resembling a bottle, with the bottom broken out. Another workman now brings on a similar lump, attached to another rod; the two are welded together; then a couple of boys take each one of the rods, and "travel," in opposite directions, to either end of a long shed. As these boys run away from each other, the glass is drawn out into long tubular wires, so to call them, and lies along on the ground, where it is suffered to remain until cooled; after which itis broken up in lengths or tubes, three feet long, and sold to the bead and bugle makers, (a distinct class of operatives;) or sent into other rooms of the same establishment, where workmen break them into minute particles.

This operation is performed by men, women, and boys—who have before them an iron gauge, into which, with one hand, they thrust fifteen or twenty tubes, at the same time, and, with an iron instrument (resembling a hatchet head) in the other hand, they rapidly chop off the ends of the tubes, according to the size adjusted on the gauge. These cuttings are then taken below, where they are put into an iron barrel along with some sand, and placed in a furnace over a pretty hot fire. A boy gives a revolving motion to the barrel, until the sharp edges of the choppings are sufficiently annealed, during which the speed of the rotary motion is progressively increased until the beads are properly shaped, when they are taken out of the barrel and polished, by being poured into bags and shaken from side to side by the force of two men—in the same manner that I have seen people, in this country, cleaning coffee and grain.

After polishing, the beads are sifted into sizes, and then some men, with light wooden trays, sort out the perfect specimens by a peculiar jerking motion, and slant which they dexterously give to the tray. The refuse is melted over again, and the now finished beads are put upon strings by a number of girls employed for that purpose. Various sizes are produced by larger or smaller tubes, as the case may be; but in all the operation is the same; the sifting process being necessary on account of the unevenness of the original tubes. The colors were very brilliant in some instances, but in all cases the glass seemed full of grits and blemishes, until toned down by the action of the fire in the second furnaces. Many large warehouses receive the beads, where they are packed away in boxes for exportation. In one warehouse I saw several hundred tuns of them, filling barrels and boxes, or strings of them piled away on shelves in compartments occupied by various colors. They were of all sizes, from the minutest mustard seed to the immense egg-like articles, exported to Africa and the Indies, for the use of the dusky beauties of those climes.

J. P. B.

Brakes to Fire Engines.

MESSRS. EDITORS—Fire engines that are to be used where hills have to be descended should be furnished with brakes of sufficient power to enable a small party of men to make any required descent without danger to themselves or the machine; for it often happens that when a fire alarm is given, only a small part of the company is present at starting. In this way life is often endangered, and a valuable engine may be put *hors du combat* at the moment when it is most needed.

For the want of such an appendage, one very strong and active young man was lately killed in this city by being run over, and his yoke fellow barely escaped, by the engine striking the curb-stone, and leaping completely over him. An alarm of fire had been given late at night, and the few men who first collected were endeavoring to take the engine—a heavy one—down a long hill near the engine house, as they had often done, but its velocity became so great that their force was insufficient to check it, and the men at the yoke fell, one of them being killed, while the other narrowly escaped.

The means for preventing such accidents are so simple, inexpensive, and so well-known to mechanics generally, that the non-application of them shows a lamentable disregard of life, safety, and property.

R. S. AVERY.

Washington, D. C.

Ascent of Balloons.

MESSRS. EDITORS—In the SCIENTIFIC AMERICAN of the 10th May, I noticed an article from J. Wise, calling in question my opinion relative to ballooning. I am aware that much lighter gases can be made than sub-carburetted hydrogen; I am also aware that any gas with which a balloon may be filled will expand, as the external pressure diminishes. The gas used for light should be carburetted hydrogen, of a specific gravity of nine to ten of the atmosphere, as sub-carburetted gas gives too blue a flame to be brilliant. Most of the gas I have seen burning must contain sulphuretted hydrogen, the flame being of a yellowish hue.

I remain of the same opinion expressed in my former article relative to the great elevations attained by aerial voyagers. Those who ascend elevated mountains find breathing to be very difficult at an elevation of twelve thousand feet, and by the time they ascend towards sixteen thousand, the blood, for want of external pressure, will find vent through the pores of the skin. How much higher, then, can human beings ascend and retain animal life with full possession of their mental faculties? WM. PARTRIDGE.

Binghamton, N. Y.

[California Correspondence.]

Ancient Ruins.—Coal.

MESSRS. EDITORS.—I recently had an opportunity of examining some ancient ruins, lately discovered, about six miles east of Santa Cruze. They were nearly buried up in a sand hill. I found twenty-three chimneys with their tops peering above ground. These chimneys are round, and vary in diameter from four to twelve inches. They are made of sandstone, and were filled up with loose red sand. The stones of which they are built are cut circular, and cemented together. I stamped on the hill and it emitted a hollow sound, indicating vaulted chambers below. A tunnel is now being run in under the hill; at first it was attempted to sink a deep shaft, but the sand came in too fast upon the miners.

Who built these structures no one can imagine. They appear to be thousands of years old. A large yellow pine tree was growing on the top of the hill. The number of years required for the sand to cover up these houses and form the hill, before the seed of this large tree germinated, could not be less than two thousand years.

In a number of the SCIENTIFIC AMERICAN, received by me in March, the discovery of coal near Stanton, in this State, is noticed. The discovery of the coal is a fact, but the quality is not so good as has been represented. I have a coal bed on the same range of mountains, about forty-five miles from Monterey. I discovered it on the 19th March, 1855, and have spent some money in prospecting the vein, which is but small, although the coal is of a good quality. I discovered a copper mine in Santa Clara in 1853, and I am part owner of a splendid soda spring, situated seven miles west of Santa Clara City. The waters of this spring have been found very effectual in curing diseases of the eye, and all skin eruptions.

Yours truly, ELISHA HUGHES.

Santa Clara, Cal., May, 1856.

Material for Roofing Buildings.

We have recently received a number of letters requesting information respecting a good and cheap material for roofing houses. One says:—"I wish to know how to prepare a cement for the roof of a house, as shingles are dear where I reside, and besides they are liable to take fire." Another says:—"I wish to be informed of a cheap fire-proof covering for a house with a flat roof, as tin roofing is too expensive in Texas, being fourteen dollars per hundred square feet; shingles are combustible, and will not answer. Any information respecting a good cheap fireproof material for roofs would be very acceptable to a large number of persons." Such is about the purport of all the letters we have received on the subject, and we will give such information as we possess in answer to these inquiries.

Slates, tiles, and tin make good fire-proof roofing, but they are too expensive for common houses. A cheap cement for common roofing—although not perfectly fire-proof—can be made of pitch, tar, oil, sand, and gravel, as follows: The roofing boards should be first covered with coarse thick paper, or, what is better, coarse cotton cloth, smoothly tacked down. Equal parts of tar and pitch are brought to a boiling point in a cauldron placed on the ground near the building to be roofed. A gallon of linseed oil to every thirty gallons of pitch and tar is then added, and stirred about, and then a quantity of clean fine sand is also added, and stirred up until the whole attains to the consistency of mortar. It is then lifted hot, in buckets, to the roof, and laid on in a thin stratum, the surface of which is thickly covered with dry sand, well pressed down with a spade. Piece by piece, a few yards at once, is thus put on, until the whole roof is covered. Three coatings of this kind—making about one inch thick—are laid upon the top of one another, and the whole is finished by very fine gravel and sand laid on the top of all, firmly pressed down, and the loose stuff swept off. This makes a good cheap roof, not liable to crack, and not liable to take fire from sparks like shingles.

It is a common practice with carpenters to use poor shaky boards for roofing. They seem to act upon the principle that, because they are to be covered up or hidden, any kind of lumber is good enough for this purpose. This is wrong on their part. The boards for roofing should all be of equal thickness, well matched at the edges, and closely driven together. If the roofing boards are not of equal thickness under a tin roof especially, it is scarcely possible to prevent it leaking, because there is always some unequal expansion of the boards, and this tends to rupture the joints.

Another cement roof, and one that is fire-proof, can be made as follows:—The coarse cotton cloth to be laid under the cement should first be boiled in a solution of alum and sulphate of copper, and then dried. One pound of each is sufficient for a hundred yards of cloth. After the cloth is smoothly tacked down on the boards, a mortar of common lime mixed with hair as for priming, and containing about five per cent. of plaster of Paris is laid upon the cloth. When dry it is brushed over with boiled linseed oil, which is also suffered to dry. The second coat, and the last, is composed of a cement formed of slacked lime, freely exposed to the air for some weeks, sifted and mixed with dry sand, litharge, some calcined gypsum and linseed oil, and made into cement of such a consistency as can be laid on freely with a trowel. There should be equal parts of lime and sand, and about five per cent. of the litharge and burned gypsum. This cement should be laid on smooth, and about one-fourth of an inch thick, at least; but the thicker the better. The oil gives elasticity to the cement, prevents cracking, and repels moisture. The sand, litharge, lime, and plaster of Paris, (calcined gypsum) are fire-proof materials, and thus formed into a cement become very hard in the course of a few weeks. These cements are intended for what are termed flat roofs.

Blake's fire-proof paint mixed with oil, and laid on in successive coats, is said to make a good fire-proof roofing. Litharge, red lead, ground sand, chalk, and brick dust, mixed with oil, makes a good fire-proof paint; but the cheapest roofing material is the tar and pitch cement described.

Tin roofs are expensive, and what is worse, the generality of tin roofers around New York city are either careless or unskillful, for every high wind that blows is sure to strip off a number of such roofs. If sheet copper were as cheap, it would make a much better fire-proof roofing than tin. We have been informed that the roofs of thousands of houses in Russia are made of sheet iron coated with paint; and that they are durable and cheap, but this is probably owing to Russia iron being made on the spot, and sold at half its cost here.

It appears to us that sheet iron cut into plates, boiled in oil, and nailed lap-edged on smooth roofing boards, then coated with a thick paint of red lead mixed with sand, would make a cheap and durable fire-proof roof. We have also seen some fine specimens of cast iron plates or shingles, which we think will eventually be introduced extensively.

(For the Scientific American.)

Cowperthwaite's Patent Hydrant.

MESSRS EDITORS—Your remarks under the head of "Business with the Patent Office," though kindly intended, have, unfortunately, created a wrong impression upon the minds of my correspondents and others. They believe that my patent just granted is already sold. Such, however, is not the case. I have a number of offers, two of which fully reach the amount referred to, but involving points so unsatisfactory as to leave me, for the present, undecided; consequently, the patent is yet for sale, but if not soon disposed of, it will be withdrawn from the market in time to commence the manufacture of hydrants before the setting in of the cold season.

I have had my invention fitted and enclosed in a common wooden hydrant tree, and planted by the side of the old style of hydrant, for the express purpose of testing the two together, under like circumstances. The old hydrant—which was examined previous to the trial, and proved to be in good condition—was continually stopped and blocked up with ice. But my improvement never once refused the crystal stream when called upon. The form of valve is such as always to keep a close joint, no matter how much it may wear; it also gives an easy and quick exit to the back water, emptying completely the upper pipe. The whole arrangement, nozzle, as well as machinery, is completely enclosed from the external air, and freezing is evidently out of the question. Either the wooden or cast-iron tree can be used. No digging, cutting off pipes, re-soldering, or other troublesome or expensive repairs need be resorted to. The machinery can be easily and quickly taken out in a few minutes, by any person of ordinary abilities, repaired, and replaced again. The contrivance is simple, substantial, and in no way liable to get out of repair. The expense of manufacture is about that of the common hydrant. I have every reason to believe it the best contrivance for the purpose in existence. C. J. COWPERTHWAITE.

Philadelphia, Pa.