

(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 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 it is 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,

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 tons 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

Who built these structures? They appear to be old. A large yellow pine on the top of the hill. The required for the sand to cover and form the hill, before the tree germinated, could not thousand years.

In a number of the SCIENTIFIC AMERICAN received by me in March, the discovery of the coal is a fact is not so good as has been reported to Africa and the Indies, for the use of a coal bed on the same range about forty-five miles from covered it on the 19th March spent some money in prospecting which is but small, although good quality. I discovered Santa Clara in 1853, and I discovered a splendid soda spring, situated of Santa Clara City. The spring have been found very diseases of the eye, and all sorts of ailments.

Yours truly,
E. Santa Clara, Cal., May, 1856

Material for Roofing.

We have recently received letters requesting information and cheap material for roofing says:—"I wish to know how ment for the roof of a house dear where I reside, and be ble to take fire." Another to be informed of a cheap material for a house with a flat roof, too expensive in Texas, being per hundred square feet; sh bustible, and will not answer tion respecting a good, cheap material for roofs would be very acc number of persons." Such is port of all the letters we have subject, and we will give such we possess in answer to these

Slates, tiles, and tin make roofing, but they are too expensive houses. A cheap cement for —although not perfectly firm made of pitch, tar, oil, sand follows: The roofing board covered with coarse thick paper better, coarse cotton cloth, is down. Equal parts of tar brought to a boiling point in a on the ground near the building gallon of linseed oil to every part pitch and tar is then added, and then a quantity of oil is added, and stirred up until it to the consistency of mortar. hot, in buckets, to the roof, at thin stratum, the surface of covered with dry sand, &c. It is covered with a spade. Piece by piece, a few is thus put on, until the whole Three coatings of this kind one inch thick—are laid upon another, and the whole is finished

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

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.

MESSERS. 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.

um stratum, the surface of which is covered with dry sand, well pressed down a spade. Piece by piece, a few yards at a time is thus put on, until the whole roof is covered. Three coatings of this kind—making a roof one inch thick—are laid upon the top of another, and the whole is finished by very fine gravel and sand laid on the top of all, well pressed down, and the loose stuff swept off. This makes a good cheap roof, not liable to crack, and not liable to take fire like sparks like shingles.

It is a common practice with carpenters to use poor shaly 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 joined 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 especially good, can be made as follows:—The cotton cloth to be laid under the cement should first be boiled in a solution of alum and phosphate 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 cement mixed with hair as for priming, and contain