THE STATUE OF WILLIAM PENN FOR THE PHILADELPHIA PUBLIC BUILDINGS.

We illustrated in our last issue the electroplating works for coating with aluminum the ironwork of the clock tower of the Philadelphia Public Buildings. The buildings occupy the block at the intersection of Broad and Market Streets of the city of Philadelphia. The north and south fronts are 470 feet long each; the east and west fronts are 486½ feet long, thus forming an almost square structure. In the center is an immense court, 200 feet square. Exclusive of this courtyard, an area of nearly 4½ acres is covered. Archways, 18 feet wide and 36 feet in height, one in the center and each side, give access to the court. The basement story, 18 feet 3½ inches in height, is of fine white granite. Above this, white marble from the Lee quarries, in Berkshire County, Mass., is the material.

From the north side of the courtyard the tower rises. For it to rest upon, a bed of concrete was laid 23 feet 6 inches below the ground; this mass is 100 feet square and 8 feet 6 inches thick. The tower proper is 90 feet square at the base and its walls are there 23 feet in thickness. They are built of dressed dimension stones, each weighing from two to five tons.

As the tower rises it falls off a little at each story and at the spring of the dome becomes an octagon, 50 feet in diameter. Below the dome is the clock, which will be one of the great clocks of the world. The face is 20 feet in diameter and the center, representing the axis of rotation of the hands, is 361 feet above the pavement, over 130 feet higher than the neighboring Masonic Temple on Broad Street.

Above the clock story of the tower rises the great iron and steel dome shown in our illustration, which, when coated with aluminum and weathered to the peculiar bluish tint acquired by the metal, will present a most striking object. Before erection it is put together at the Tacony Iron and Metal Co.'s works, where all fitting, drilling and other operations will be performed before it is transmitted to the site of its erection.

On the top of the giant structure the colossal figure of William Penn is to stand. This figure is in bronze, and represents the famous founder of Pennsylvania. The artist, A. M. Calder, designed to represent Penn in the full vigor of manhood. The face is a study from the original painting belonging to the Historical Society of Pennsylvania, to which it was presented by Penn's grandson, Granville Penn.

It represents William Penn at about 38 years of age, in the costume of the last years of the reign of Charles II. This was the period of his first visit to the colonies. As the building is a city building, not a State building, the endeavor was to represent Penn rather in his relations to the city than to the State; hence it is that his left hand rests upon a copy of the city charter. As far as it can be seen, the exposed page carries the seal, two feet in diameter, of Charles II. The characters upon the scroll are six inches long, and reproductions of the English characters used at that time in engrossing. The part disclosed reads as follows: "Charles II., King of England and France; defender of the faith. To all to whom these presents shall come 'Greeting.' Whereas our trustie and well beloved subject William Penn, Esquire, sonn and heir of Sir William Penn, deceased."

The statue is cast in about 50 pieces. They are secured together in the statue by bolts and rivets passing through inwardly projecting flanges, and the joints are so faced and tool-wrought as to be almost indiscernible. The weight is 52,400 pounds. It is 37 feet high and it stands 547 feet 3½ inches above the surface of the earth. Thus, with the exception of the Eiffel Tower, the figure could look over any building on the surface of the earth.

The following are the dimensions of the different elements of the statue:

Hat, 3 feet in diameter, rim 23 feet in circumference; nose, 13 inches long; eyes, 12 inches long and 4 inches wide; mouth, from corner to corner, 1 foot; face, from hat to chin, 3 feet 3 inches; hair, four feet long; shoulders, 28 feet circumference and 15 feet in diameter; waist, 24 feet in circumference and 18 feet 9 inches in diameter; buttons on coat, 6 inches in diameter; hands, 6 feet 9 inches in circumference, 3 feet in diameter, and 4 feet long; fingers, 2 feet 6 inches long; finger nails, 3 inches long; legs, from ankle to knee, 10 feet; ankle, 5 feet in circumference; calf of legs, 8 feet 8 inches circumference; feet, 22 inches wide, 5 feet 4 inches long.

Color in Plant Life.

Those familiar with the growth of flowers, says the *Horticultural Times*, know how essential light is to the creation of color. The most gaudy blooms and the most brilliant foliage, if kept in the dark or overshaded, will become pale and almost white. This fact shows the presence in the plant of some chemical agent which is acted upon by the actinic rays. To some extent this chemistry of nature is understood by florists, who, by the use of chemical manures and other means, strive to take the greatest advantage of it. For instance, it is a common practice to mix alum and iron filings with the soil in which certain plants are grown, in order to bring out special colors. The bluish-tinted hydrangea is the result of such treatment. Salts of iron, or sodium phosphate, added to the soil turn the crimson of the peony to violet, and produce blue hortensias.

According to Dr. Hansen, who has studied the subject very closely for many years, there are only three distinct pigments to be found in flowers—setting aside the chlorophyl, which forms the green coloring matter in all plants. These colors are yellows, reds, and blues. The yellows are mostly in combination with the plasmic sap, while the others exist chiefly in solution in the cell sap. The yellow pigments form an insoluble compound with fatty matters, which is termed lipochrome. Orange is formed by a denser deposit of the yellow, and the color in the rind of an orange is identical with that found in many flowers. The red in flowers is a single pigment soluble in water, and decolorized by alcohol, but capable of being restored by the addition of acids. Lipochrome combined with this red pigment produces the scarlets and reds of poppies and of the hips of hawthorns, but the varying intensity of reds in roses, carnations, peonies, and other flowers depends on the presence of a greater or a lesser quantity of acids. The blue and violet colors are also decolorized by alcohol, but are reddened by acids. Florists have already succeeded in producing a very large scale of unusual colors in flowers, and there seems to be very good grounds for believing that it is possible so to manipulate nature that she will produce blossoms of every conceivable tint.

The Introduction of Wire Rope.

J. E. EMERSON.

The pick and shovel are the first necessary implements for the construction of a railroad. Then the rolling mill is necessary for the production of the rails, and the locomotive is the masterpiece of combined ingenuity and exquisite workmanship and genius all represented in this masterpiece. Capital is just as essential as any element in order to construct this modern highway for the rapid conveyance of the vast products of productive industries. Inherited capital rarely engages in manufacturing enterprises. Manufacturers are usually workmen who, by their perseverance and study, first became the directors of others and assumed the higher positions, and thereby attained mastership and proprietorship or part ownership in the plant.

A neighboring German of quite advanced age and quite wealthy, a few months ago was relating to me a most singular event which ended in a most glorious triumph of success. Said he: "One day a rather tall German entered my office and inquired if I was the proprietor of the wire mill. I replied that I was. Said he: 'I am looking for wire to make a wire rope.' 'A what?' said the gentleman. 'A wire rope,' said he, taking from his pocket a piece a few feet long and the size of a small finger. I took it and examined it. It was very flexible, and he told me its strength, and the rather surprised me. I said, 'Yes, we can make wire like that;' and gave him the price per ton. He then Said I have a conditional order for a wire rope of several tons weight to be used drawing coal out of a mine in Schuylkill County, this State (Pennsylvania), but they are cautious, and want to use it six months before paying.' 'Well, yes,' said I, 'we can furnish you the wire; but, as you are a stranger to us, we would want some assurance that we will be paid.' 'Well,' said the honest-looking German, 'I cannot give you any, for I am not worth a dollar in the world, and, if the rope fails, I don't suppose I can ever pay you; but I am confident it will not fail, and I will make you this proposition: You see I get a large price for the rope, and it will cost me as much to make it as for you to furnish the wire; and, if this succeeds, it will open a field for an immense business in wire, and I think you can afford to take part of this risk with me.' I then went and consulted my partner in business, and, after a short time, we said, 'Leave your order. We will accept it on your terms.' We made the wire, and he the rope. It proved a success and we got our money at the end of six months, and we sold that man more than two hundred thousand dollars' worth of wire for wire rope before he got to making it himself."

That German I was well acquainted with, and he died worth over a million and a half, and left his business and fortune to his family. I do not feel at liberty to give the names of these parties, but they have a great reputation in suspension bridge building, second to none on earth. It sometimes takes several generations to practically develop a discovery. When Franklin sent up his kite and bottled the first lightning, no person on the earth then could have conceived what was to come. Professor Morse was not then born, and when he sent the first message from Washington to Baltimore, "What hath God wrought!" Edison was not born. The arc and incandescent lights were away in the distant realms of darkness, and to propose to use it as a motive power for propelling street cars and now railroad locomotives would in Franklin's time have been classed as Salem witchcraft. And no doubt air ships will yet be propelled by electricity and passengers will cross the Atlantic by it.

Inventors, if you have little or no means and desire success, invite capitalists to assist you. And capitalists, if you wish to employ your surplus to benefit the world, use part of it to aid the honest inventor. And, mechanics and workmen, if you desire employment for your support, don't fight genius or capital, but help them. Don't envy the man his wealth, but encourage its accumulation in every way possible. These three great elements, capital, labor, and genius, should go hand in hand.

The Solubility of Phosphoric Acid.

Prof. Norman Robinson, State chemist of Florida, has made some interesting experiments on the solubility of the phosphoric acid of Florida phosphates in different solutions. The rock taken for the experiment was a typical sample of hard rock phosphate, containing 74·80 per cent phosphate of lime, 3·20 per cent ferric phosphate, and 2·89 per cent phosphate of alumina. When treated by the usual method, with neutral ammonium citrate, this gave 2·43 per cent available phosphoric acid. In preparing the sample for the various solvents, one gramme of rock was ground with an equal amount of each of the solvents and carefully rinsed into a beaker, where sufficient water was added to bring the volume to 100 c. c., a cover was placed over it and the beaker set aside. In the cases of using potassium hydrate and quicklime as a solvent the materials were placed in a bottle and carefully sealed to exclude air.

The chemicals used as solvents were muriate of potash, containing 93·21 per cent potassium chloride, kainit, containing 23·46 per cent potassium sulphate, with the usual proportions of calcium and magnesium sulphates and sodium chloride; sulphate of potash, containing 94·06 per cent sulphate; commercial flowers of sulphur; caustic potash and nitrate of potash. A check was made for the solvent power due to water alone. After standing five months the samples were opened and the following solvent power of each one determined:

	Phosphoric acid. Per cent.
Pure water alone dissolved	0·64
Water and muriate of potash	0·58
" " kainite	0·48
" " sulphate of potash	0·46
" " flowers of sulphur	0·45
" " caustic potash	1·19
" " nitrate of potash	0·48
" " caustic lime	0·00

Professor Robinson states that these experiments have been made in answer to many queries received by him as to the solvent power of the salt given. From the results shown he infers that neutral salts retard the solution of phosphoric acid in water and caustic lime absolutely prevents it, and he recommends that caustic lime should not be applied to ground at the same time with phosphoric manures.

Personal.

Mr. J. M. Allen, for twenty-five years the president of the Hartford Steam Boiler Inspection and Insurance Company, was recently the recipient of a handsome testimonial from his associates and the officers of the company, on the completion of the quarter of a century in his office. It consisted of a very rich service of 101 pieces of silver, together with an album of autograph tributes of friendship and esteem, illuminated in Tiffany's best style, both the service and the album being noble specimens of choice workmanship and exquisite design. The manner of presentation, too, was quite out of the ordinary. Mr. Allen being hastily summoned home while absent on his summer vacation to find a genuine surprise party assembled in his house at Hartford for the purpose, not a whisper of their intention having previously reached the ears of the recipient.

Improved Armor Plates.

At a recent meeting of the Franklin Institute, Philadelphia, Mr. F. Lynwood Garrison gave an account of some recent trials of Harveyized nickel steel armor plate, made by the Bethlehem Iron Company, of Bethlehem, Pa., and tested on the private proving grounds of the company. The results of these trials demonstrated a decided advance in the resisting powers of such plates to the penetration of projectiles. Photographs of these plates taken after the firing test (five shots from an 8-inch gun, powder charge 81¾ pounds, Holtzer projectile weighing 250 pounds). Referring to the last experiment, the speaker stated that the plate (8 by 6 feet by 10½ inches thick and weighing 18,600 pounds), which was a companion piece to one that had lately been tested at the Indian Head proving ground, of which trials a full account appeared in his report published in the *Journal*, had received a total energy of impact of 25,040 foot tons, fully 50 per cent greater than the plates were subjected to in the previous trials, and exhibited, nevertheless, much less injury than the plates in the former tests. He considered it doubtful whether armor plates equal in quality to this had ever been produced elsewhere.