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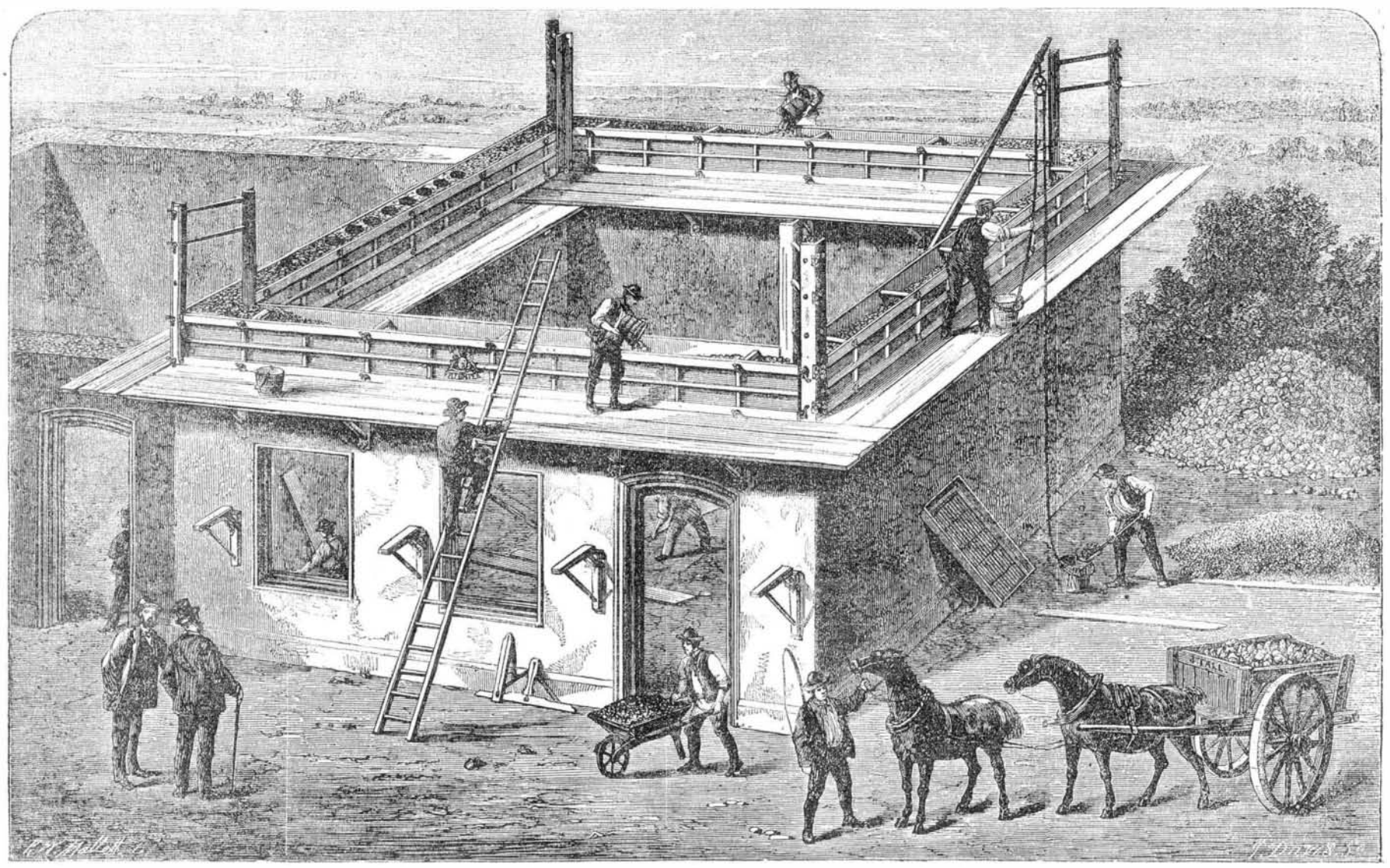
CONCRETE BUILDING.

Much interest has been taken throughout many sections of the country in the subject of concrete building. We have several times given outlines of the processes employed, and have discussed the merits of the method to some extent. Our readers will have gathered from what we have already said that we regard the method with considerable favor, and though doubtless in this, as in all attempts at improvement, there will be more or less failure at first, it is evident that this mode of building is growing in favor, both in this country and in Europe. The annexed engraving, from the *Irish Farmers' Gazette*, gives a most excellent idea of the manner in which the system known in England as Tall's system of constructing walls, houses, etc., in Portland cement concrete is conducted.



MODE OF CONSTRUCTING CONCRETE BUILDINGS.

This system has been used in the construction of a large number of houses in Paris, erected under the directions of the Emperor, who takes great interest in the improvement of the dwellings of the working classes, and has also been applied in other parts of Europe, and to some extent in the United States.

The work can be performed by ordinary laborers, who, after a four or five day's experience, acquire all the requisite expertness. Even boys have been successfully employed in this kind of building. The only skilled workman necessary is a common carpenter, whose duty is to adjust the frame-work or apparatus to receive the successive courses of material, and place joists, doors, and window-frames properly.

The apparatus is designed to construct 18 inches in hight daily over the entire extent in hand. What is done in the evening of one day is hard next morning, and quite strong, the best proof of which is, that the wall itself, as it rises in hight, supports the necessary scaffolds, as shown in the accompanying engraving. A double curb entirely surrounding the upper part of the walls, serves to hold the plastic material in place, until it acquires sufficient hardness to support itself.

The material consists of one part of Portland cement to eight parts of coarse gravel. The cement and gravel are first well mixed together in a dry state, and when this is done, it is damped by means of a large watering pot, and again mixed by a pronged drag such as is used for dragging dung out of a cart, until the entire heap has been wetted and mixed together. It is then put in iron or zinc pails, and poured into the frame, where it is leveled by men stationed for the purpose. In order to save concrete, large lumps of stones or brickbats are put into the center of the wall, and covered over and about with concrete. Frost does not affect the concrete after it has once set, which, with good cement, will be in about five or six hours. Nor do heavy rains appear to injure it in the slightest degree, though they may chance to fall ere the concrete has hardened. The walls can be made straight and even as it is possible for walls to be, and the corners as sharp and neat as if they had been formed of the most carefully dressed stone.

Concrete makes excellent floors, and the walls and floors are quite impervious to vermin of all kinds, and also to wet. Many kinds of building bricks will absorb water; hence brick houses, when the walls are saturated with water, are cold. This is not the case with houses constructed of concrete, as it is non-absorbent of moisture, and such houses must be, therefore, more healthy.

This novel mode of building homes has excited great interest in the neighborhood of Runnamoat, Ireland, and the proceedings have daily attracted numbers of people from all parts.

While concrete may be used in constructing buildings of every description, it is peculiarly adapted, from its cheapness, for the construction of cottages for laborers, and also for farm buildings. Its cost is not more than half that of brickwork; almost any material can be used along with the cement, and as we have already shown, the most ordinary class of country laborers are quite competent to carry out the details of the system. With reference to its adaptability for large buildings, we may mention that a warehouse 70 feet long, 50 feet wide, and 60 feet high, five stories in all, has been erected on Mr. Tall's system for Mr. H. Goodwin, Great Guildford street, Southwark, England, and that gentleman testifies in the warmest terms to its satisfactory character, and is making arrangements at the present time for the construction of another similar building. The warehouse already erected has attracted universal admiration from the practical and scientific gentlemen who witnessed its erection.

The chief element of success, when the cement is of good quality, seems to be the thorough mixture of the dry materials, to secure uniform strength, the whole process is extremely simple, and by the aid of our illustration cannot fail to be readily comprehended.

We are informed that some dwellings of this character are soon to be erected by Mr. Charles Kamlah, at Rutger Park, Belleville, N. J., on ground purchased by the New York Co-operative Building Lot Association, a short distance from New York, on the Newark and Paterson branch of the New York and Erie Railway.

BALLOON MAKING.

From Once a Week.

The great Captive Balloon, which has for some months past been exhibited at Ashburham Park, near Chelsea, has been removed from London—to the sea side, we hear—and having availed ourselves of a tolerably clear day, for making an ascent in it, during the last week of its stay, we propose to furnish our readers with an account of our aerial journey; and further, to exhibit the progress of aeronautic science, by prefacing our account of M. Giffard's balloon, with a few words about the first aerial machines that were seen in this country and in France. We have lately received from San Francisco accounts of a machine combining the qualities of a balloon and a ship, which is propelled by steam, and is said to be easily steered in any direction at the pleasure of the man at the wheel. If so, the great problem of aerial navigation has at last been solved, but until we see the aerial ship successfully brought into port, we shall not be inclined to believe the stories circulated by the San Francisco journals.

Since the days when Daedalus and Icarus made their fabled flight over the Ægean, on wings fastened on their shoulders with wax, down to the present time, the construction of a machine, as fitted for navigating the air as a ship is for sailing on the sea, has been a task essayed by many men of scientific pursuits and mechanical ingenuity, and their efforts, as everybody knows, have hitherto been anything but successful; indeed, the history of aeronautic science is a story of failures. The first inventor of a balloon discovered the practicability of ascending into the atmosphere, and the latest professors of aerial navigation have been able to show us but little more. A good deal of interest attaches to the early balloon ascents; the Montgolfiers were the first persons who constructed a bal-

loon; although scientific men were acquainted with the principles upon which such apparatus should be constructed for some years before 1783, when the brothers Joseph and Stephen Montgolfier exhibited their balloon at Annonay, a little town in France.

It was on the fifth of June in that year, when the members of the provincial meeting of the States of the Vivarais were assembled in the town, that the Montgolfiers made their first public experiment. Their balloon was merely a spherical bag, made of pieces of coarse linen, loosely buttoned together, and inflated with rarified air, produced by kindling a fire underneath it. The fire, having been lighted, was constantly fed with small bundles of chopped straw until the balloon was sufficiently distended, when it was loosed from its stays, and rose with an accelerating motion until it had reached a considerable elevation, when its velocity became constant. It rose to the height of about a mile, and then gently descended, falling in a vineyard without the town of Annonay, having been suspended in the air for the space of ten minutes. This successful experiment delighted all who witnessed it, and the two Montgolfiers were rapturously applauded by their fellow townsmen. In Paris on the 27th of August, in the same year (1783), a similar ascent was shown to a great crowd of people assembled on the Champ de Mars: this balloon was constructed by MM. Robert and Charles, and was made of thin silk, and inflated not with rarified air, as the Montgolfiers' had been, but with hydrogen gas. The success of this experiment was complete, as the balloon rose rapidly into the air, and after traveling fifteen miles in three quarters of an hour, fell in a field near Ecouen.

Shortly after this the brothers Montgolfier were invited by the Academy of Sciences to repeat their experiment of Annonay on a larger scale in Paris. The invitation was accepted, and accordingly on the 19th of September, they sent up a balloon from the grounds of the palace at Versailles. On this occasion a sheep, a cock, and a duck were put in a basket attached to the balloon, and were the first animals ever carried up in the air in this way. They came down safely enough from their voyage, and this probably suggested to M. Pilatre de Rozier the idea of making a similar experiment in his own person; for when the Montgolfiers next sent up a balloon, he boldly leaped into the car or basket just as the machine was leaving the earth, and enjoys the fame of having been the first man who ventured upon an aerial voyage. The account of these balloon ascents in France of course reached England in due time, and created great excitement among the scientific and the curious. The accounts given in the London *Chronicle* at the time are very amusing.

The first balloon seen in England was constructed by an ingenious Italian named Zambeccari; it consisted of oiled silk, and was about ten feet in diameter, and its exterior was entirely gilt. It made its first ascent in November, 1873. It appears to have attracted the attention of George III., for on the 25th of the same month we find this account in the *Chronicle:* "By His Majesty's desire, Mons. Argeue, a Prussian, had invented one of these celebrated air balloons, and on Tuesday, about noon, the whole apparatus was brought into the Queen's garden at Windsor, in near y the following order: A large tube of about five feet in diameter, about one-third filled with water, and in that a close vessel of considerable less size. Near to these was placed a large table, on which were put several bottles, supposed to contain a variety of chemical preparations, and with them the (Wonder of the World) the air balloon, which bore an exact resemblance to a bladder that was void of air or water." The balloon was then inflated with gas, and, "as soon as the business had gone thus far, a string was fixed to the balloon. His Majesty then took hold of the string, and in proportion as he gave it scope or pulled it down, the ball rose or returned. The King finding it so manageable, went under the window where the Queen and the Duchess of Portland were, and gave the globe a space of string till it rose to the hight of the window, and there kept it in poise for a considerable time. From thence he went to the window where the Princess Royal, Princess Augusta Sophia, and Princess Elizabeth were, and let it up again: then brought it down and taking it on his hand, said, 'Now, it goes.' It accordingly ascended in a perpendicular manner for upwards of three minutes, when having taken a southerly course, it was lost to the sight of the numerous body of spectators."

While his Majesty King George was treating his wife and daughters to an ocular demonstration of the truth of the stories told about balloons, his subjects remained very incredulous on the subject, particularly having doubts as to whether anybody was foolhardy enough to go up in them; accordingly the *Morning Chronicle* takes the trouble to get reliable information about the French balloons, and on the 11th of December, 1783, has an article headed "Air Balloons," from which we make a short extract:

"As many persons in this kingdom still discredit the relations conveyed in the French papers respecting the air balloons, we have the authority to use Dr. Lettsom's name for the following genuine communication from his correspondent at Paris, dated the third of this month: 'On Monday, an air balloon made of taffety, covered with a solution of gum-elastic, was filled with inflammable air, under the direction of Messrs Charles and Robert, and was let off from the Tuileries. It had suspended to it a basket, covered with blue silk and paper finely gilt, in the shape of a triumphal car or short gondola, in which Mr. Charles and one of the Roberts embarked, and mounted up into the air, from among many thousands of people of all ranks and conditions. Besides the Duke de Chartres and a great part of the French nobility, there were present the Duke and Duchess of Cumberland, the Duke and Duchess of Manchester, and many other foreign princes and nobility. The triumphant cars of Venus, Medea, and various others, seemed to be realized; with this difference, this was neither drawn by peacocks, doves, or dragons; neither was it mounted on a cloud; it was, however, a most majestic spectacle.'"

This authentic narration of a balloon ascent in France was calculated to allay suspicion, and prepare the public mind for a further draft upon their credulity, to which the *Chronicle* treated them to the following effect:

"It is well known that a pair of wings and a tail of the most curious workmanship are constructing for a person, who, in the spring, is to be sent off upon an air balloon. They are to extend twenty yards each way, and in form to be similar to those of a bat, having silk instead of feathers. With the help of the wings and tail, the man, when extended on the air balloon, will be able to guide himself to whatever part of the country he may wish to go. The wings above mentioned are making at the instance of a person of very high rank in Paris, and who has betted 5,000 guineas that the foreigner who has undertaken this scheme makes a safe passage from Dover Cliff to Paris."

What became of the poor foreigner who proposed to emulate the feat of Daedalus and fly across the sea, we do not know; but we think we may say with certainty that the person of very high rank lost his wager and his guineas.

Soon after this, balloon ascents became common enough in England. The first person who went up in a balloon on the 21st of September in the following year, and from that this side of the Channel, was a countryman of Count Zambeccari's, named Lunardi, who made an ascent from London on time to this no very important improvement in the arts of constructing aerial machines has taken place; the grand desideratum is to discover a means of steering them. Fans or paddles have been made to answer the purpose in the still atmosphere of a covered building, but heretofore all efforts to make a rudder capable of withstanding strong currents of wind have altogether failed of success.

Johnson's remarkable acumen displayed itself in the discussion of the practical value of the new machines as a means of locomotion. He writes to his friend and physician, Dr. Brocklesby, September 29, 1784: "On one day I had three letters about the air balloon. . . . In amusement, mere amusement, I am afraid it must end, for I do not find its course can be directed so as that it should serve any useful purpose." And again in a letter addressed to the same gentleman, and dated Oct. 16, Dr. Johnson says: "The fate of the balloon I do not much lament; to make new balloons is to repeat the jest again. We now know a method of mounting into the air, and I think are not likely to know more; the vehicles can serve no use till we can guide them." And in the art of guiding them no progress has been made during the eighty or ninety years that have elapsed since they were first constructed. They are, what they were, nothing more or less than ingenious toys; and during that interval the history of balloons is but an account of ascents, either as a holiday attraction or for the purpose of scientific inquiry into the state of the atmosphere at different hights from the earth's surface. In connection with these the names of Messrs. Glaisher and Coxwell deserve a word of recognition. A new interest, however was given to the subject, by the arrival in London of a balloon of gigantic size, designed by M. Giffard, a French engineer, at the beginning of last summer. The novelty in this instance consisted in the great balloon being held captive by a conical rope, equal to a strain of five and twenty tuns, 2,150 feet in length, and paid out and coiled again by steam engines of 200-horse power. A certain amount of danger had attended ascents in the old balloons, as when once in the air it was a matter of the purest conjecture where and how you might alight again on ground. But M. Giffard, by attaching a rope to his balloon, offered the opportunity of an aerial voyage unattended by such risk, as you were lowered again into the amphitheater of wood and canvas whence, a quarter of an hour before, you had started on your journey.

With the exception of one little escapade—a run down into the Vale of Aylesbury with no one on board—the balloon has worked very satisfactorily, although the season has been very unfavorable for aerial navigation. Having chosen a fine day, we proceeded to Ashburham Park, and arrived there at about four o'clock in the afternoon. On entering the amphitheater, of course the object that prominently struck you was the balloon, fastened by the rope to a pivot wheel in the center of the arena. It is an enormous spherical bag, made of three layers of canvas, inclosing one layer of india-rubber, and is inflated with pure hydrogen gas, made in retorts on the premises at Ashburnham. The cost of filling it is upward of £600; and this will give some idea of the magnitude of this monster balloon. After a delay of about an hour, owing to the state of the wind, about five o'clock the balloon made a trial trip, having in the car M. Aymos, and three others of the assistants. All working smoothly and well, she was lowered again into the circle, and about twenty persons, of whom seven or eight were ladies, entered the car; and the great balloon having been let slip from her stays, we rose with an easy and majestic motion into the air. After reaching a hight of about 400 feet, at a signal from the car—a white flag—the engines were stopped, and we remained stationery for some minutes. We were now at about the hight of the cross on St. Paul's, and the view was extensive and beautiful. At a signal from the car, we again mounted into the air; and, after a second halt, we finally rose to a hight of about 1,500 feet, the balloon being drifted slightly in an oblique direction by the wind. This was about four times the hight of St. Paul's. Unfortunately, the day was anything but clear, and so the panorama visible from that elevation on a perfectly clear day was much curtailed; but we could see Highgate, Richmond, Brentford, and Wimbledon, in a northern and western direction; while Eltham was pointed out to the east, and Greenwich and Woolwich to the south. Having remained for a few minutes at that hight, we were slowly lowered again into the arena. As we descended, the bridges on the river looked in some places scarcely further apart than the rounds of a ladder. Neither in ascending or descending was the motion at all unpleasant; and the ladies seemed to apprehend no cause for alarm.

After having spent about twenty-five minutes in the clouds, we safely disembarked again at Ashburnham, much gratified with our aerial trip, and with nothing to regret but the hazy state of the atmosphere, which, to a great extent, curtailed the prospect we should otherwise have enjoyed at so unusual an elevation from the busy world.

The Influence of Weather on Sickness.

Dr. Ballard, in his Report on the health of Islington, for 1867, thus aphoristically states the influence of the weather on sickness:

1. That an increase of atmospheric temperature is normally associated with an increase of general sickness. 2. That a decrease of atmospheric temperature is normally associated with a diminution of general sickness. 3. That for the most part the increase or decrease of sickness is proportional in amount to the extent to which the atmospheric temperature rises or falls. 4. That it is an error to suppose (as is popularly held) that sudden changes in temperature are (as a rule) damaging to public health. A sudden change from cold to hot weather is indeed very damaging; but a sudden change from hot to cold is one of the most favorable circumstances that can occur when sickness is regarded broadly as respects a large population. 5. That, remarkably enough, these influences are most marked in the directions I have mentioned in the colder season of the year, and more certain in the winter than in the summer. 6. That rises and falls of temperature are more certain and effectual in their special operation upon public health when at the same time the daily range of temperature is lessened, than they are when the daily range is at the same time increased; rises of temperature increasing sickness more certainly and markedly, and falls of temperature decreasing it more certainly and markedly. 7. That a fall of rain lessens sickness generally, sometimes immediately, sometimes after a short interval, and that, as a rule, the reduction of general sickness is greater when the fall of rain is heavy than when it is light. 8. That drought, on the other hand, tends to augment general sickness. 9. That wet weather in the summer season operates more certainly in improving public health than it does in the winter season.

Retarding the Growth of Strawberry Vines.

George Burson, of East Palestine, Ohio, has recently patented the following for the above purpose:

The plants are carefully packed in boxes, two feet six inches in depth, which are filled with sufficient soil to prevent the roots from being exposed to the air, and at a sufficient distance from the surface of the ground to secure a uniform temperature of from 40° to 42°. This should be done late in the fall or early in the spring, and is, of course, impracticable, except in the vicinity of abandoned mines.

The second method consists in placing the plants in boxes, as above described, in early spring, and packing them in sawdust and ice within an ice-house, but as ice-houses are not always convenient or accessible, this method also possesses some objectionable features, which, however, do not exist in the third method, which can be employed in all sections of the country, except in the extreme Southern States. The vines, are, as before, packed in boxes in the fall, and after being slightly covered with sawdust, are exposed to the weather until the soil is frozen hard, when the boxes are piled together, covered with from eight to ten inches of sawdust, and exposed until March, when they should be thickly covered with straw. When thus treated, the plants will remain in a frozen condition until late in summer, or until fall. While kept in this condition, vegetation remains suspended, and in order that a continuous supply of strawberries may be had, from their usual seasons until late in the fall, it is only necessary to remove from the boxes a sufficient number of plants each week, which must be placed in the ground and cultivated in the usual manner.

What is claimed as new is the herein-described treatment of strawberry plants for the purpose set forth.

Cement.

Edward Heylyn, of Rochester, N. Y., has lately patented the following cement:

Melt forty-six pounds of resin, and five pounds of linseed or other oil or grease in an iron pot; and, when nearly melted, put in eighty-four pounds of dry calcined plaster of Paris, twenty pounds of white sand or brown sand, and twenty pounds of the refuse matter from the pipes and retorts of gas works, said dust being both of a brown and black color. Let them boil, and while boiling mix the ingredients by stirring and mixing, with an iron fork with a wooden handle, and when all mixed, pour the same into casks or molds ready for use.

Depositing Metals on Fibrous Materials.—Silk, muslin, or other fibrous materials, may be covered with silver, copper, or gold, by the electro-plating process, thus: Make a solution of sulphate of copper in liquid ammonia; dip the materials in this, and dry them; then place them in a solution of honey or grape sugar in water at a warm temperature. The sugar will thus decompose the copper salt, and deposit metallic copper on the fiber. The silk or muslin may now be transferred to the electric bath, and receive a deposit of such metal as is desired.—*S. Piesse.*