For the Scientific American.

The Voltaic Battery.---Precipitation of Metals.

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We will now take into consideration those difficulties which beset the first attempts to substitute the voltaic precipitation of silver in the place of the ordinary practice of plating, by first rolling the metal into a thin sheet, and soldering it on the basis.

The first experimenters observed that the silver peeled off, when the burnisher was applied, and also that it would rise in blisters by a gentle heat, and very frequently the adhesion would be so slight as to let the silver peel off by gentle polishing.

The non-adhesion exhibited by the burnisher is owing to the extreme ductility of the voltaic silver, although the film may be in perfect union with the base, yet from the suddenness of the termination of one metal, and beginning of the other, and their different degrees of malleability and ductility, the action of the burnisher is confined entirely to the film: although the expansion may appear as trifling, yet, being a molecular force, it must be irresistible. Everybody is familiar with the action of these forces in the bursting of rocks by the freezing of water, and also in the breaking of iron and porcelain by unequal expansion.

To obviate this, the surface to be plated should be well rubbed with fine sand-paper, or roughened by nitric acid when the article will admit of such treatment. After this roughening, the article is given a thin coating of quicksilver, by dippping it into a very dilute solution of nitrate of mercury for a few moments, then wiped off, rinsed in hot water, and put into the silver bath. The film of mercury acts as a solder in joining the two metals; the suddenness of the transition from one metal to the other is avoided by the mercury dissolving a minute portion of the two metals, and commingling them together.

Another great cause of non-adhesion arises from the deposited metal not being in actual contact with the base, from the intervention of heterogeneous matter. When a base metal is put into the cyanide of silver, it decomposes it; the cyanogen forming an insoluble coating of cyanide of zinc or copper, and on this coating the silver, which had been in union with the cyanogen, is deposited, giving the article a silvered appearance. We may now perceive that no matter how well an article has been cleaned prior to the battery operation, there is, after all, a coating of dirt under the silver: for the very immersion into the bath converts the surface into a cyanide. This spontaneous decomposition is well exhibited by dipping a piece of polished steel into a solution of sulphate of copper: in a few seconds the steel is coated with a bright film of copper, but there is not the least adhesion, and examination shows that under this beautiful deposit of copper there is a dirty layer of sulphate of iron.

In connection with what is said about this spontaneous decomposition, let it be understood that when the metal is precipitated by the battery, the acid or other solvent is outside; and also, that rapidly as the solution acts on the base, yet it still requires time, and that the cyanide of potassium acts more readily than the cyanide of silver. Taking all these circumstances in view, we are pointed to the following remedy: the solution should be very strong, and contain no more cyanide of potassium than sufficient to dissolve the cyanide of silver. The battery should be very strong on the article at the moment it is immersed in the bath. The article, once coated by the battery action, should be well brushed with chalk, after which the silver may be thickened by arrangements of the battery for preventing the black deposit noticed in the number on "Gilding." The silver deposited by this method, in conjunction with roughening and amalgamating, resists every attempt to separate it from the base.

Another trouble which attends a thick coating of silver is, that it is apt to become very rough, and also that some parts will blacken while other parts will work clear. A pure solution and thorough agitation are t. e remedies here.

Along with the silver a small portion of cyanide is deposited: this makes the silver tarnish very quickly. To get rid of this cyanide, the plated articles are laid in a warm and dilute solution of sulphuric acid for half a day, then very slowly heated in an oven to the temperature of boiling oil, and kept at this heat for a day; after this the articles are to be finished by burnishing, and other modes of finishing silver articles. VOLTA.

Inauguration of the Great Colossal Statue of Bavaria at Munich.

Almost every body has heard of the great annual People's Festival which was held at Munich last October, and which was of special interest this year, and attracted an unusual number of strangers, from the fact that the uncovering of Schwanthaler's colossal statue of Bavaria was to take place during this great week of gaiety.

This stupendous work of art—awful in its Titanic proportions and its calm majestic beauty—the result of ten years' incessant anxiety—stands on a broad meadow to the west of Munich, a portion of the great plain that stretches away to the feet of the Alps. It rests on the edge of what appears at first to be an artistical terrace—but is in fact, a huge step where the plain suddenly descends into the lower plain on which stands the city of Munich. The figure of this colossal Virgin of the whole German world, with her Majestic lion by her side, is 54 feet high, and is placed on a granite pedestal 30 feet in height; so that the beautiful temple of the "Ruhmeshalle," or Hall of Fame, erecting behind, seems dwarfed into strange human insignificance.

This figure, typifying the spirit of recognition and reward of all excellence and achievement whatever, stands with upraised wreath, as if ready to crown any Bavarian who may be worthy to enter her temple fame. It was a grand idea of King Ludwig's, this of placing the Genius of Reward on the spot consecrated to the people and their annual meeting.

The "Ruhmeshalle" is unfinished, and will require for its completion at least two or three years more. It is a beautiful Doric building, of white marble from the Untersberg, adorned with emblematical friezes by Schwanthaler. It was designed by Leo von Klenze; and the busts of all the great men of Bavaria, without regard to difference of religious belief, or to origin, are to be arranged along the walls.

Through the interior of this bronze tower-like figure ascends a winding staircase, leading to a chamber in the head, large enough to contain 28 persons—whence, through openings among the curls, the spectator can look across the plain and city towards the glorious Alps. This may give an idea of its colossal size. But beyond the poetry of mere size—a grand idea arises from reflecting on the ten years of toil—stupendous toil—mental and bodily, of its creators—the difficulty overcome by patient industry—the dangers endured with unflinching courage—and the melancholy truth that the final accomplishment of the mighty work is unwitnessed by the two men whose lives seemed bound up in its success—Schwanthaler, the sculptor, and his friend Lazarini, his "right hand," as he called him, who modelled the colossal figure under his direction.

Though Schwanthaler was already attacked by his fatal malady at the time when he designed the "Bavaria," at the King's suggestion—he not only modelled a variety of designs for the Colossus, but also completed a smaller figure of the "Bavaria," as they now see her, 13 feet high. When the huge wooden tower was built in the Royal Bronze Foundry, and after what may be called a gigantic wooden skeleton had been erected by a crowd of carpenters—after tons and tons of clay had been piled together over this, so as to form a mass of material on which to work—there, day after day, might be seen the unwearied, energetic, though physically-suffering sculptor, guiding with watchfulness and love the accomplishment of his idea, which ever grew beneath the hand of his friend Lazarini and his troup of workmen.

Stiglmayer, the originator and director of the Bronze Foundry, died in 1844, just before the casting of the "Bavaria" began. His nephew, Ferdinand Miller, full of youth, energy, patience, and experience, was ready to succeed him. The casting took place at five different times—commencing with the head. Thiswas cast in 1844. In casting the bust of the figure—the largest portion—the greatest difficulty had to be encountered. It was necessary to melt, for the purpose, twenty tons of bronze—five tons more than had ever before been melted in the furnace. As this immense mass of metal slowly began to fuse, it began also to cake—thus threatening to destroy not only the casting, but the whole furnace, with untold danger to life and limb. Six men had, in spite of the oppressive heat and the ever-increasing glow of the furnace, to take it by turns, night and day, incessantly, to stir with long iron bars the molten mass lest it should adhere to the furnace walls, and so bring annihilation on all. On the evening of the fifth day of anxiety, when Ferdinand Miller, for the first time, sought a short repose in his chair, he was suddenly aroused by his faithful and anxious fellow watcher, his wife, with a cry of "Ferdinand, awake, the foundry is on fire!" It was so. The ever-increasing heat of those five days and four nights had caused fire to burst forth among the rafters. To have attempted to extinguish the fire by water, with this molten mass below, would have caused the immediate destruction of the place. All that could be done was, by means of wetted cloths, to keep down the fire. This was tried—and the melting went on as before. Amid such danger did the casting of the bust take place. About midnight on the 11th of October, 1845, "Success" was shouted forth; a load of anxiety of many kinds fell from every breast; and all then hastened to the complete extinguishing of the fire.

Jacquard and his Machine.

No one man, we believe, has done so much towards improving and advancing the manufacture of ornamental textile fabrics, as M. Jacquard. France, Italy, Germany, Britain and America, pay tribute to his fertile genius. In silk weaving, his loom has supplanted all others; it is also extensively applied to the manufacture of carpets, and the making of ornamental lace, of both silk and cotton.

Jacquard was not brought up a weaver or machinist, he was originally a straw hat manufacturer, and it was not until after the peace of Amiens that his attention was attracted to the subject of mechanism. The communication between France and England being then open, an English newspaper fell into his hands. In this he met with a paragraph stating that a premium would be awarded by a society in that country to any person who should weave a net by machinery. The perusal of this extract awakened his latent mechanical powers, and induced him to turn his thoughts to the discovery of the required contrivance. He succeeded, and produced a net woven by machinery of his own invention. It seems, however, that the pleasure of success was the only reward he coveted, for as soon as accomplished he became indifferent to the work of his ingenuity—threw it aside for some time, and subsequently gave it to a friend as a matter in which he no longer took any interest. The net was by some means at length exhibited to some persons in authority, and by them sent to Paris. After a period had elapsed in which M. Jaquard declares that he had entirely forgotten his production, he was sent for by the Prefect of Lyons, who asked him if he had not directed his attention to the making of nets by machinery. He did not immediately recollect the circumstance to which the Prefect had alluded; the net was however produced, and this recalled the fact to his mind. The Prefect then rather peremptorily desired him to produce the machine by which the result had been effected. M. Jacquard asked three weeks for its completion; at the end of which time he brought his invention to the Prefect, and directing him to strike some part of the machine with his foot, a knot was added to the net. The ingenious contrivance was sent to Paris, and an order was thence dispatched for the arrest of the inventor. Accordingly, M. Jacquard found himself under the keeping of a gens-d'arme, by whom he was to be conducted to Paris in all haste, so that he was not permitted even to go home to provide himself with the requisites for his sudden journey. When arrived in Paris he was required to produce his machine at the Conservatory of Arts, and submit it to the examination of inspectors. After this ordeal he was introduced to Bonaparte and to Carnot, the latter of whom said to him, with a look of incredulity, "Are you the man who pretends to this impossibility—who professes to tie a knot on a stretched string?" In answer to this inquiry the machine was produced, and its operation exhibited and explained. Thus strangely was M. Jacquard's first mechanical experiment brought into notice and patronized. He was afterwards required to examine a loom on which from twenty to thirty thousand francs had been expended, and which was employed in the production of articles for the use of Bonaparte. M. Jacquard offered to effect the same object by a simple machine instead of the complicated one by which the work was sought to be performed,—and produced the mechanism which bears his name. A pension of a thousand crowns was granted to him by the government as a reward for his discoveries, and he returned to Lyons, his native town. So violent, however, was the opposition made to the introduction of his loom, and so great was the enmity he excited in consequence of his invention, that three times he, with the greatest difficulty, escaped with his life. The *Conseil des Prud'hommes*, who are appointed to watch over the interests of the trade, broke up his machine in the public "place;" "the iron (to use M. Jacquard's own expression) was sold for iron—the wood for wood, and he, its inventor, was delivered over to universal ignomy." The ignorance and prejudice which caused the silk-weavers of Lyons to destroy a means of assistance to their labors, capable of being made a source of great benefit to themselves, was not dispelled till the French began to feel the effects of foreign competition in their silk manufacture. They then were forced to adopt the Jacquard loom, which led to such great improvement in their silk weaving; and this machine is now extensively employed through the whole of the silk manufacturing districts of France, as well as of England and America. By reference to page 286, Vol. 3, Sci. Am, comparing the artical there with this one, a very good history of this extraordinary man will be made out.

French Farming.

Although the French modestly boast of being at the head of every nation in everything, they are, with few exceptions, the most backward of all in things the most essential. In agriculture, for instance, which is their principal resource, they are most shamefully behind the English; they use the clumsiest instruments, are totally ignorant of others of great utility, and adopt, with strange pertinacity, the vicious system of cultivation which was employed centuries ago. The consequence is, that, though they have a soil far more fertile, and a climate immeasurably superior, they cannot equal the English production in wheat, barley, oats, or potatoes, their yield being on an average full one-third less per acre than theirs. And as to the breeding of cattle, they are "no where," their oxen being wretched things, and awfully dear; the consequence of which is, that meat, instead of being considered indispensable to every man, is not consumed at all by millions, and is a rare luxury to the majority of the rest of the population. But what shows the discreditable state of agriculture more strongly, is the fact that it is only very recently that the French have become aware of the importance of draining; and that what little draining has been effected has been done almost exclusively by the Government.

A number of scientific gentlemen of Belgium have lately made some meteorological observations on the heights of Belleville, Paris. They sent up to a certain height several kites, to which were affixed a number of needles, and although the weather was perfectly serene at the time, they drew from the clouds flashes of electricity similar to those which accompany a storm.