Electricity and the Statue of Liberty.

Some of our daily contemporaries appear to be getting alarmed lest the statue of Liberty be slowly but surely destroyed through the electrical action developed by the contact of the internal bracing of iron with the shell of copper. There is, however, no ground for such fears. Mr. Bartholdi, it is hardly necessary to say, foresaw the possible danger from this source, as well as that due to expansion, and took the proper precautionary measures to obviate both. It is proposed (according to *Le Genie Civil*), when the parts of the statue are assembled, to insulate the two metals by interposing small plates of copper covered with rags smeared with red lead—a method successfully employed in the sheathing of sea going vessels.

Notwithstanding the letters communicated by certain electricians to some of the daily journals, it would seem that too great importance is being attached to this matter. No precaution whatever against galvanic action was taken in the case of the 75 foot statue of St. Charles Borromeo (on Lake Maggiore), which, although constructed of copper only one and a half millimeters (0·06 inch) thick, and internally braced with iron that is in direct contact with the shell, has held its own for nearly two centuries without any perceptible change. Again, in the theater of Monte Carlo, which is situated very near the sea, and which was constructed over four years ago, the cupola is of copper in direct contact with the iron framework that supports it; yet no injury to it, due to galvanic action, has as yet been observed.

Ethnology.

The Director of the Bureau of Ethnology at Washington, Major Powell, has mapped out the work in his department for the coming fiscal year. The interesting government researches into the life history and arts of the early Americans, which were inaugurated several years ago, are to be continued and extended. The work of this department has already attracted much attention on all sides, and the additions of the coming year promise to be of much value.

Dr. Cyrus Thomas, who is in charge of the division of mound exploration, will resume the work begun about three years ago, and will be aided by two or three assistants. He will first visit Wisconsin, in order to examine the effigy mounds in that locality, and later in the season will go to Tennessee and Mississippi, where investigations are already in progress. Since being in the field, Dr. Thomas has secured about 15,000 specimens of the handiwork of the mound builders. Many of the mounds are undoubtedly very ancient, but others are of comparatively modern origin, and bear date subsequent to the advent of the Europeans. One mound in Tennessee disclosed a string of sleigh bells buried among the flint and bone implements in such a position that it undoubtedly formed part of the original deposit. In another in Georgia, two copper plates were found bearing figures resembling those discovered in Central American ruins. The workmanship on these plates is much superior to that on any of the accompanying articles, and leads to the suspicion that they came from the South. They are the only indications which might point to any connection between the mound builders and the Aztecs or Pueblos, while, on the other hand, there is much to make us believe that the origin of these curious mounds is directly traceable to the ancestors of the Cherokee and other races of the Mississippi valley. A Spanish coat-of-arms in silver and other articles of European manufacture have been found in a Mississippi mound at a point which De Soto is supposed to have visited. As the earlier Spaniards were regarded by these simple people as celestial visitors, it is quite possible that the mounds containing European articles were built in commemoration of the supposed divine visitation. The purpose of many of the mounds is still a matter of conjecture, while others were undoubtedly intended as places of burial, or were even the foundations of Indian villages, which were thus secured from inundations.

Mr. Victor Mendeleff, the artist and architect, whose models of the Pueblo and cliff villages form so interesting an exhibit at the National Museum, has already started upon his work in New Mexico, Utah, and Arizona. Last year he visited the Chaco Cañon in New Mexico, and made surveys of several pueblos of high antiquity. The ruins of this locality are of masonry, and are far superior to the adobe pueblos of the present day. In places they are still 40 feet high, and show the floor lines of three or four stories. The largest of these ancient apartment houses covers more ground than the capitol at Washington. Mr. Mendeleff, who has been engaged in the study of Pueblo architecture for several years, will first visit the Moki towns, seven in number, three of which are found on a narrow mesa, whose precipitous sides are nearly seven hundred feet high. Later he will go the Cañon de Chelley, in Arizona, where a narrow gash in the earth, a thousand feet deep and fifty miles in length, contains a number of cliff villages of considerable extent, many of which are perched high upon the rocks, six hundred feet above the bottom of the ravine. He will also make survey of the "seven ruined cities of Cibola," in the neighborhood of Zuñi, so celebrated in Spanish fable and romance.

The study of the sign language and picture writing will also be continued. Having found the key to the expressive gestures of the aborigines, it has been found that the rock etchings and paintings existing in all parts of the country, which were before so meaningless, are now easily translatable to any one familiar with the sign language. The pictography of these ancient American races is found to be almost identical with that of the Chang dynasty, which flourished in China 1500 B.C. Investigations will also be continued into the verbal language of the different tribes, with a view to their better classification.

Philology, which has revealed so much of the ancestry of the European nations, promises to be no less useful in determining the relationships of the North American tribes. The two most powerful tribes of the Southwest, for instance the Apaches and the Navajos, have in this manner been traced to a common origin in British America, where the parent stock, speaking the same language, are still found.

These investigations have established the fact that the advancement of the North American tribes, as illustrated by their art during the past two or three centuries, is exactly equivalent to that existing in Europe and the East during the stone age.

ELECTRIC FAN.

A very refreshing invention, especially for the hot weather season, is the electric fan shown in our engraving. It consists of an ornamental standard, about a foot high, on which is mounted a screw propeller fan. On connecting the wires of a battery with the standard the fan revolves rapidly, and delivers a cool breeze in any direction desired. The upper part of the standard, on which the fan is carried, is hinged, which allows of the adjustment of the fan to any desired oblique position. The battery is contained in a little box, 4½ inches square and same depth, holding liquid enough to run the fan for several hours, when it is poured out and replaced by a fresh supply.

Pat. applied for, S. M. & Co.

We have had one of these little fans running on our desk for several days past, and it gives much satisfaction. They are made by Stout, Meadowcraft & Co., 21 Ann Street, New York, whose excellent and reliable work in the line of small electrical lights and other instruments is well known.

The Treatment of Corpulence on Physiological Principles.

As analyzed by the *Birmingham Medical Review*, November, 1884, Ebstein, in his work on corpulence, gives some valuable practical points for the reduction of obesity. According to him, fattening is strictly analogous to the fattening of cattle, and depends on overfeeding. He, however, disputes the current view that fat makes fat; on the contrary, he thinks fatty food protects the albumen, and prevents its forming fat. His plan of treatment, therefore, consists in moderating the quantity of food, and while cutting off all vegetable carbo-hydrates, sugar, starch, etc., allowing a moderate quantity of fat, two or three ounces daily, to be taken. He also suggests that the diet should be monotonous, greasy, and succulent, so as to cause satiety rapidly. He disallows beer, but permits light wines.

The plan advocated appears rational, and is free from the objection to Banting's method, which is too much like starvation. The following is the diet used successfully by Ebstein in one of his cases:

Breakfast.—One large cup of black tea—about half a pint—without sugar; two ounces of white bread or brown bread, toasted, with plenty of butter.

Dinner.—Soup, often with marrow; from four to six and one-half ounces of roast or boiled meat, vegetables in moderation, leguminous preferably, and cabbages. Turnips were almost and potatoes altogether excluded. After dinner, a little fresh fruit. For second course a salad or stewed fruit without sugar. Two or three glasses of light wine, and immediately after dinner a large cup of black tea, without milk or sugar.

Supper.—A large cup of black tea, as before. An egg, a little fat roast meat, or both, or some ham with its fat, Bologna sausage, smoked or fried fish, about one ounce of white bread, well buttered, occasionally a small quantity of cheese, and some fresh fruit.

On this diet the patient lost 20 pounds in six months.

Ebstein insists on the necessity of always keeping to the restricted diet if the tendency to corpulence is to be successfully combated.—*Therapeutic Gazette.*

Origin of Gulf Stream Life.

In speaking some time ago of the almost incredible profusion of animal life in the surface waters of the Gulf Stream, the suggestion was made that a biological question of no small interest and importance was forced upon us by the facts there presented. The question is this—Where shall we look to find an origin for the bioplasm there displayed? From the lowest to the highest, from the infusoria to the fishes and the cetaceans, they are preying upon one another. We see how the blackfish and the dolphins live. They are but appropriating the flesh of fishes, squids, etc., already existing as perfectly formed animal food, and digesting it for their own nutriment. This is plain, and in accordance with common experience, but as we go on down in the scale we must presently be brought to a pause.

Animal bioplasm, according to all the recognized laws of modern physiology, cannot be produced from inorganic materials. No one principle has seemed to be more thoroughly established than this—that it is the peculiar function of the vegetable kingdom to absorb the proper inorganic materials, say carbon, oxygen, nitrogen, and hydrogen, and transform them by its wonderful and life-giving power into organic substances, into bioplasm first and then into the various tissues required. It has been held that the food, properly speaking, of all forms of animal life must have had these inorganic materials transformed into organic substances before ingestion, otherwise there was no possibility of its assimilation; that carbon, oxygen, and hydrogen were all of them foreign bodies to us, and when introduced into our systems, perhaps mechanically with our food, must remain of no service to us, and could never be by our powers of digestion transformed into a hydrocarbon, like sugar for instance, or starch, or fat.

This has been, and is, the accepted theory and belief, and yet if we adopt it and follow it out to its legitimate conclusions, we shall find the facts which were previously stated as to the teeming life of the Gulf Stream exceedingly difficult of explanation. The vast proportion of that life must originate in the region where it lives and dies. Some favored wanderers come in from outside, for the cetaceans, the sharks, the albicore, barracuda, dolphin, etc., travel fast and far, but they are of small importance in the aggregate. There must be of necessity a very large amount of new bioplasm in constant and daily origination from inorganic materials. The question is, Whence does it come?

It is the unanimous testimony of the observers on the staff of the Fish Commission, from whom the facts as to the abundance of the surface life are derived, that the water of the Gulf Stream is remarkably clear and transparent, that the manifestations of vegetable life in it are very small indeed. There are masses of Gulf weed floating here and there, but not in any great quantity, nor is there reason to believe that the Gulf weed is used for food, except very slightly, by the animals around it. Many of the hydroid polyps are attached to it, and drift with it, but they use it only as a moving house, a boat, or raft, so to speak, while they industriously collect their food from the water around them. Some of the small fishes, specially the curious, grotesque looking *Chironectes*, make the same use of the Gulf weed tangles as do the polyps, but they never touch it as food. It is quite sure that the Sargassum furnishes small amount of material for new bioplasm. Nor does there seem evidence that any of the algæ are sufficiently abundant to afford any relief from the perplexity. Even the minute, microscopic diatomaceæ which swarm so infinitely in many parts of our shallow waters are apparently in small numbers in the Gulf Stream, and we have, therefore, no profusion of vegetable life which in the slightest degree corresponds to that of animal life.

The only explanation that seems available is this—that some, or perhaps all, of the lower forms of animal life have really the power which has hitherto been reckoned the peculiar prerogative of vegetable organisms, that of transforming inorganic matter into organic. If we assume this, the mystery of the origin of the swarming myriads is at once removed. Nor is the assumption one that need startle us, for we well understand that along the border line, on either hand, the functions which are shown in the higher grades to be clearly animal or vegetable are so slightly specialized or differentiated as to have much less significance than in the more complicated types.

Disinfectants.

Two pounds of copperas, or sulphate of iron, dissolved in a pail of water, will greatly assist in purifying a privy or cesspool. A pound of nitrate of lead dissolved in the same way is excellent for sinks, drains, or vaults. Chloride of lime is also effectual, or a layer of charcoal dust will prevent offensive odors arising from any decomposing substance. The quantity of these substances will depend upon the amount of filth to be deodorized, and the length of time during which they will be effectual will depend upon local conditions.

Some Common Mistakes about Canned Goods.

A United States Army surgeon writes us from Indian Territory, asking as to the reason for two punctures sometimes seen in the caps of cans containing fruits and other goods, and whether this indicates that the goods have been "reprocessed." The facts touching this point, as communicated to us by one who is an expert in the business, are as follows:

The presence of two or more punctures or solder holes in a tin of canned goods is not evidence of reprocessing. In capping the can after filling with fish, fowl, meat, vegetables, fruit, or whatever it may be, a cap is used which has a small hole in the center. A soldering iron, made of copper, heated to a red heat, is used, the heat from which produces expansion of the air within the can, and so that the air escapes through the hole or vent in the center of the cap. If it could not do so, it would be a difficult operation to cap the can successfully.

After the can is capped the vent is closed with a drop of solder, and thus one vent, or puncture, is shown on the top of the can. The can is then placed in a bath or process kettle, after which the operation varies. If the goods are what is known as "double bathed goods," they are taken from the kettle after a certain time, which varies according to the article packed or the formula of the processor, and then vented or exhausted. The ends of the can being bulged out from the pressure exerted by the expansion of the contents under heat, the first vent hole in the top is either unsoldered with a hot soldering iron, or a puncture is made with an awl or sharp instrument, within half an inch from the first vent. The air and steam having been allowed to escape, the tops resume their natural condition, or are pressed in, when the second vent is closed with another drop of solder, and the goods are returned to the process kettle and bathed, according to the kind of goods being packed.

If a hot soldering iron is used to open the first vent hole referred to, after the can comes from the bath, as is sometimes done, only one vent hole will be observed on the top of the can.

If another puncture is made in the cap, and that closed with a drop of solder, it will show two punctures or vent holes in the top of the can; and as some manufacturers double process their goods, some cans will show three solder spots, but this is not evidence that the goods have been what is known as "swells," which have been reprocessed; for what would be easier for a packer who desired to reprocess goods than to open the original vent hole in the top of the can, provided there was only one there, let out the gas which had generated from fermentation, solder it up again, and give it a few minutes' bathing, which would serve to keep it? This is sometimes done in the case of seed fruits, which generate a gas from their pits or seeds, the germination element of which is not entirely killed by the original processing.

Trying a New Compressed Air Car.

In Astoria, one of the suburbs of New York city, a trial was made a few days since of driving a street car by compressed air, according to the system of Robert Hardie. The car was built by the John Stephenson Company, and fitted up with compressed air chambers to run a small motor or engine on the front platform, the air chambers being under the car and the car seats, and wherever there was spare room. This capacity was said to be sufficient to run the car ten miles, the rate of motion being very efficiently controlled by an air brake.

THE GREAT BLOWERS OF THE DENAIN AND ANZIN FORGES.

The progress of metallurgy is necessitating the construction of more and more powerful accessory apparatus. The Societe des Anciens Etablissements Cail, which has signalized itself in recent times by the construction of the new French artillery and by that of the great Bange gun, has delivered to the Denain and Anzin Forges and Steelworks two colossal machines, which are designed for forcing air into the Bessemer blast furnaces installed at those great works. Our engraving (from a photograph) represents one of the two blowers of the Denian Forges. These apparatus, which are each composed of two vertical engines coupled to the same shaft, have the following dimensions:

ONE OF THE BLOWERS OF THE DENAIN AND ANZIN FORGES.

Diameter of steam cylinder	3 feet.
Diameter of air cylinder	7 "
Common stroke of pistons	5 "
Number of revolutions per minute	22
Effective pressure of steam	11 lb.
Pressure of air in cm. of mercury	20
Diameter of single-acting air pumps	1¾ ft.
Stroke of pistons	2½ "
Volume of air sucked in per minute	15,894 cub. ft.

These machines have been running regularly, day and night, ever since they were set up, which dates, for the first ones, back to January, 1884.

The coupling of the two engines upon the same shaft permits of running at very variable velocities—from 5 to 6 up to 22 revolutions per minute, according to the needs of the moment, while blowing at a given pressure.

The distribution of steam is perfect, and the vacuum is constant at 65. The wind cylinders are well constructed. The force and suction valves are rectangular bands of rubber, resting upon gratings. They offer a wide section to the passage of the blast, and operate almost noiselessly. These magnificent apparatus have met all the requirements that were expected of them, and do honor to the industry of our country.—*La Nature.*

The Strength of Clinker Concrete.

The utilization of clinkers as building material is the subject of a long memoir by M. Louvier, an architect of Lyons. It is stated in the *Journal of Gas Lighting* (London) that the extensive use of clinkers for foundation work was begun in the neighborhood of Lyons by small contractors, who leased from the municipality frontages on new roads where the subsoil was bad. Originally these clinkers accumulated in the vicinity of works, where they formed an eyesore, and were given freely to any one who would remove them; the cost of the material delivered on building sites being not more than 1 s. per cubic yard. The contractors found them so useful, however, that clinkers are now marketable in Lyons, and cost, delivered, as much as 10 s. 6 d. per cubic yard. A small quantity of common, or hydraulic, lime is mixed with the clinkers before use, and the mixture is then wetted and rammed in layers.

When arches or vaults are formed of this kind of clinker concrete, care is taken not to place the layers of material parallel to the surface of the ground or the curve of the centering, but to ram the layers in such a way as to consolidate them vertically to the curve of the intrados. In this way all risk of shaking out any of the material is avoided. Originally used by cheap constructors, this method of construction has been adopted by architects for important works; and M. Louvier has recently depended upon it for the basement of the new *hotel* of the Lyons prefecture. He had previously constructed an experimental vault of the required dimensions, 6·30 meters span, 1·24 meters rise, the concrete being 0·45 meter thick at the crown, and the abutment 0·80 meter wide and 0·90 meter deep.

Three weeks after it was built, this arch was loaded with a weight of 2,500 kilos. per superficial meter; and the load was kept on it for 15 days without causing the slightest settlement or fissure. The load being then removed, a block of stone weighing 600 kilos. was allowed to drop on the crown of the vault from a height of 1 meter, without injuring the structure. Fears having been expressed lest this mixture of clinker and ashes and lime would burn, a portable forge was placed under it, and a fierce fire kept up for half an hour without affecting its substance or strength. It is further stated that at a nitro-benzine factory near Lyons, the walls of which were constructed of this material, a fire occurred of such a destructive character that the machinery was partly melted. The only effect of this intense heat on the clinker concrete was to vitrify its inner surface, but not to destroy the stability of the walls.

Dangerous Business.

N. D. Jones, who transports the nitro-glycerine for the Warren factories, makes a trip down the river in a little boat about every two months. He takes about two tons of explosives, and on his last trip, according to his statement in the Bradford *Era*, he narrowly escaped being run down by the steamer Emma Graham. He stated that the pilots seem to delight in running little boats down, and some day this will be done to the sorrow of some of them, since the amount of glycerine on board would be sufficient to tear a boat up so fine that it would require a search warrant to find the splinters.