

PROFESSOR COFFIN.

Professor James Henry Coffin, LL. D., was born in Williamsburg, Mass., on the sixth day of September, 1806. He was sixty-six years old at the time of his decease, which occurred February 6, 1873, at Lafayette College, Easton, Pa., where since 1846 he had filled the professorship of Mathematics and Astronomy. He graduated at Amherst College in 1828.

While at Williams College, Professor Coffin erected, upon the Greylock peak of Saddle Mountain, at a height of nearly 4,000 feet above the ocean, an observatory, where continuous observations were taken, even through the winter seasons when for three months it was impracticable to ascend the peak. In this interval the clockwork faithfully did its entire duty. The anemometer had been changed by substituting for the stream of sand a series of cards half an inch square, laid consecutively on a moving band that deposited one of them every fifteen minutes. Each card being inscribed with the day and hour it represented, when the receptacle marked "North," for example, was examined, all the cards found in it indicated the exact quarter hour in the past three months when the wind was from that direction.

The work of Professor Coffin's life was the development of his theory of the winds, under the auspices of the Smithsonian Institution. But the great work to which he owes his celebrity, in all parts of the world, is his treatise on "The Winds of the Northern Hemisphere," published in the "Transactions on the Smithsonian Institution," vol. vi., in 1853. The materials on which it was based were derived from all accessible sources, including 600 different stations on land, and numerous positions at sea, extending from the equator to the 83d degree of north latitude, the most northerly point ever reached by man, and embracing an aggregate period of over 2,800 years. In this work Professor Coffin was the first clearly to establish the fact, by accurate comparison of observations, that there are three great zones of winds in the northern hemisphere. The first belt is that of the region of the easterly trade winds, extending northward in the western hemisphere to about the 32d degree north latitude, and in Europe to the 42d degree. The second is the great belt around the world of the return trades, in which the predominant direction is from the west. This extends northward in America to 56°, and in Europe and Asia to about 66° north latitude. Beyond this, principally within the arctic circle, is a belt of easterly or northeasterly winds. The common pole of these belts or zones has not the same position as that of the geometrical pole of the earth. It appears to be in latitude 84° and longitude 105° west of Greenwich, and has been denominated by Professor Coffin the meteorological pole.

These results are in general accordance with the mathematical deduction from the theory of the winds of the globe, which considers them as due to the combined action of the movement produced in the air by the greater heat of the equator, and the rotation of the earth on its axis.

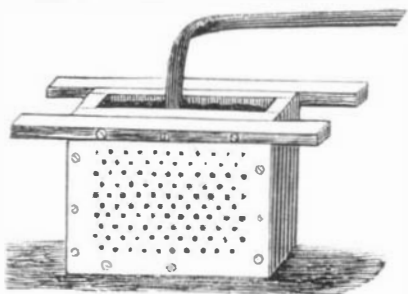
The researches of Professor Coffin also strikingly exhibit the fact of the influence of the seasons in modifying the direction of the wind, or in producing the results denominated monsoons. Thus, along the eastern coast of North America, as is shown on the maps, the tendency during the summer months, of the opposing forces, is to lessen the dominant westerly wind, and this effect is noticed even beyond the Mississippi, as well as in the Atlantic Ocean along our coast. The effect is, undoubtedly, due to the change of temperature in the land—the temperature of the ocean remaining nearly the same during the year, while that of the land is greatly increased in summer above the mean, and depressed in winter. From this cause the air will tend to flow toward the center of the continent from the ocean in summer, and from the same center toward the ocean in winter.

After the publication of the work on the winds, he continued to collect materials, at first with a view to an appendix, and finally extended his investigations to the winds of the entire globe.—*Popular Science Monthly*.

UTILIZATION OF COPPER SCRAPS IN ELECTRO PLATING.

M. Charles Guérin has recently invented a mode of avoiding the use of a copper plate as a soluble anode in electroplating, substituting therefor a mass of pieces of the metal. By this means he utilized cuttings and other scraps, previously deposited films, and, in a word, all the metal which would otherwise be thrown aside as useless for such a purpose.

Fig. 1 is a representation of the receptacle used for hold-



ing the copper scraps. It is simply a prismatic box about 1½ inches broad, sustained in the bath by the two longitudinal rods shown at the top. The acting sides are pierced each with about 100 holes, of 0.1 inch in diameter, per 16 square inches, and are of oak or beech wood, and about 0.2 inch thick. Before it is put together, the apparatus is plunged in a bath of melted wax or covered with several coats of gum lac varnish, in order to protect the parts from the action of the acid, and brass screws are used to connect it together.

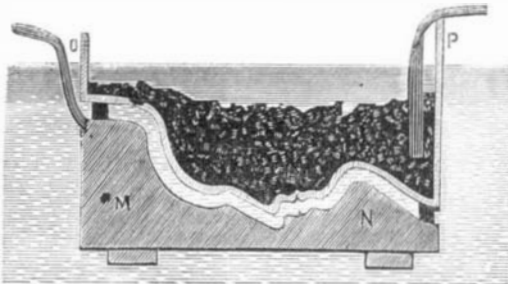
The following practical hints will be of use in selecting scraps to fill the receptacle: Choose pieces free from solder or rivets of brass or iron. Flatten out with a hammer such bits as are curled up, and divide with shears those of irregular form, so that all may fit closely upon each other. With these, pack the receptacle as uniformly as possible. For the band of copper, which serves as a conductor, choose a long piece so that it may bury anew in the mass as its lower end becomes dissolved. Every four or five days stir the pieces vigorously with a brass rod, so that they may be freed from any film of impurity which may form upon them.

The decomposing action of a current acts in inverse ratio to the distance, so that, under ordinary circumstances, the



JAMES H. COFFIN.

deepest portions of the molds are the weakest. This is a decided inconvenience in cases of objects in high relief and which are liable to prolonged rubbing or repeated shocks. The soluble anode, in its rectangular form as before described, acts exactly as a plate, and hence gives proofs of unequal thickness; but if the active surface of the receptacle, instead of being flat, be so disposed as to form a sort of counterpart, following the contour of the mold, the deposit will have a uniform thickness. This is illustrated in Fig. 2.



M N is the mold in section; over it, at a distance of 0.3 inch, is arranged a gutta percha box, O P, of which the bottom is perforated with a large number of small holes. This box first has its bottom covered with linen cloth, and is then filled with copper scraps, and the copper conducting band is inserted.

In order to localize or concentrate the galvanic action at certain places, it is only necessary to heap up the copper pieces at the desired points; and conversely, when a part has become covered with a deposit of sufficient thickness, it is obviously unnecessary to employ the protecting coverings of wax or gutta percha ordinarily used with plate anodes. The mode of forming the gutta percha counterpart, consists in coating the interior of the mold with several layers of fine thin plaster for a thickness of 0.3 inch. This is allowed to harden. Into the hollow cast the gutta percha, softened by warm water, is pressed with the hand, so as to cause it to conform to the indentations of the plaster, care being taken to keep it of uniform thickness. After cooling, it is easily removed and, after perforation, is ready for use as above described. It is of course a reduced copy of the interior of the mold.

A GOOD advertisement in a widely circulated newspaper is the best of all possible salesmen. It is a salesman who never sleeps and is never weary; who goes after business early and late; who accosts the merchant in his shop, the scholar in his study, the lawyer in his office, the lady at her breakfast table; who can be in a thousand places at once, and speak to a million people every morning, saying to each one the best thing in the best manner.—*Rowell's Reporter*.

PROFESSOR LE CONTE, in the *American Naturalist*, in his paper on economic entomology, gives an instance in which all the caterpillars in a nine acre piece of woods were destroyed by a disease which had been communicated to them by a sick silkworm. The same principle might be used in destroying the cotton worm and others of like nature.

Recent Meteors.

On the evening of December 24, 1873, a brilliant meteor was seen in the States of Pennsylvania, Maryland, and the District of Columbia. The Washington *Star* gives the following particulars:

"About 7.40 o'clock on Wednesday, December 24, one of the most brilliant meteors ever seen in this section of the country passed over the District. Its intense brightness strongly illuminated all terrestrial objects, and was visible even in gas-lit parlors, and it disappeared with a loud explosion. It was first seen a little south of east, and its course was about northwest by west. It seemed about half the diameter of the full moon, and left a track of light apparently extending thirty or forty degrees. Windows were rattled by the explosion, and one of the most dilapidated buildings in the district—the sixth precinct station house, corner of Ninth and K streets, was shaken so much as to throw down some of the plastering."

The Fairfax, Va., *News* says: "On Wednesday night, about the hour of 8 o'clock, an aerolite passed over this region, lighting up the country like midday, and is supposed to have exploded, from the sound which followed, which was equal to that of the heaviest artillery, jarring the houses all through this section of country."

The Alexandria, Va., *Sentinel* says: "About 7 o'clock on Wednesday evening, King street being at the time crowded with persons seeking the stores or enjoying the Christmas Eve sights, a meteor of most remarkable size and brilliancy shot athwart the sky from east to west, directly over the city."

From an occasional correspondent near Vienna, Md., we have received the following: "About 7.30 o'clock on Christmas Eve night, a very loud clap of thunder was heard, and a most vivid flash of lightning seen in the country around Vienna, Falls Church, Langley, and Lewisville, Va. Just before the report a shock like that of an earthquake was felt, shaking houses, etc. and the very earth itself."

Residents of Coatesville, Pa., and vicinity report that they also felt a severe shock about 8 o'clock on Christmas Eve. They attributed it to an earthquake. Houses were shaken, windows rattled, and a rumbling noise was heard. From Sandy Spring, Md., Mr. Henry C. Hallowell writes to the Baltimore *American* as follows: "It was my happy fortune, last evening, to witness one of the most magnificent spectacles I have ever beheld—the passage of a meteor of surpassing splendor. At 8 o'clock I was startled by a brilliant light encompassing me, and by the rapidly moving shadows. On looking up I saw a meteor, about one sixth the size of the full moon, of elongated shape, the body of it of an intense greenish white, and the head or front part red or blue, with some scintillations. A trail extended about three degrees. When I first observed it, it was due south, and of an elevation of about fifty degrees. The light was so brilliant that the family within the house were startled by the dimming of the lamps and by the greenish light upon the wall, and rushed to the window to see the cause. The whole landscape was illuminated for the distance of a mile. A laborer about two miles from my point of view was startled by the sudden light and the moving shadows of the trees, and thought some concealed boys were playing a Christmas trick upon him. On looking up, he says, he saw something a great deal brighter than the moon, that moved about a mile and a half through the sky. After the disappearance of the meteor, at times variously estimated from one half minute to four minutes, the latter being my own judgment, there was a sharp report that shook the windows, and some say the earth. From the length of time after the disappearance of the meteor, I supposed it the report of a cannon. I confess I was too much startled and too lost in admiration to make an accurate estimate as to height and direction, but the above are approximately correct. My position is in Sandy Spring, Md., 600 feet above tide water, eighteen miles north of Washington, latitude 30° 9'."

A Meteor in Nevada.

A meteor of uncommon brilliancy was seen at Virginia City, Nev., about 6 o'clock on the evening of January 6, 1873. A spectator, describing it, says that suddenly there came a flash of light, so dazzlingly white and bright that it caused him, for an instant, to close his eyes. Opening his eyes, almost instantly he beheld, falling perpendicularly from the heavens, a ball of what seemed white fire, of intense brilliancy, about the size of a wash tub. The huge meteor descended as swiftly as a flash of lightning, apparently falling directly to the earth. Just before it passed down, the meteor divided into a great number of fragments, apparently about the size of a man's fist. These, darting and showering down from the main globe of fire, presented much the appearance of the ribs of an umbrella when stripped of its covering, the streaks of fire streaming down on all sides of where the main ball or nucleus had been seen. Although the meteor was of a pure, dazzling white color, it threw a bright blue glare upon the buildings

A New Alkaloid from Morphia.

A new substance has been prepared, by G. Nadler, by the action of an ammoniacal solution of cupric oxide on morphia. Its chloride is of a brilliant white color, and is easily soluble in hot water, in which the ammonia throws down an amorphous precipitate, that remains unchanged in the air in the moist state. With concentrated sulphuric acid, it becomes of an intensely green color. From the potash solution, when boiled, the alkaloid separates in scales having the luster of silver. It is, moreover, distinguished from morphia by the trifling solubility of its sulphate, and from apomorphia by its stability in moist air.