

Correspondence.

Tin Poisoning.

To the Editor of the Scientific American :

A few weeks ago I read in your columns of the experiments in which Prof. Weber, of the Ohio State University, found such a number of "maximum doses" of tin in every sample of canned goods examined. Can you, or any of your readers, inform me what is the "maximum dose" of tin salts, with authority? In several authorities I have consulted, including Blyth on poisons, and Wood, I find no mention of tin at all. Although Battershall finds tin in 97 out of 109 samples, he seems not to consider it a serious matter, and Dietzsch makes no reference to tin in canned goods, etc. The contents of a thousand million cans or more are consumed every year, yet Jovian poisoning seems not yet to have become widespread.

J. L. H.

Louisville, Ky.

How to Extinguish Oil Fires.

To the Editor of the Scientific American :

In an article from Edward Atkinson in your paper he recommends sand to extinguish oil fires. It is good, if nothing better is at hand; but sand is too heavy and settles to the bottom too quick. Common wheat bran or any kind of mill feed is far better, as it is a better absorbent and lighter and spreads easier. Oil burning in a vessel or on the surface of water cannot be extinguished by sand, as it sinks too quickly; but if a handful of bran be thrown on, it will smother out the flame before it gets saturated and sinks.

In manufacturing places, where the floor is saturated with oil, there should be kept handy a barrel or more of bran. Even wood ashes or road dust is better than sand. I have had twenty years' experience with carbon oils, and I know what is best with me.

B.

Titusville, Pa., Dec., 1891.

Rain Making on a Small Scale.

To the Editor of the Scientific American :

I have read with interest the articles on "rain making" in your columns. They have served to recall a phenomenon I witnessed some years ago that may be of general interest.

On a warm, close, foggy June morning after an early shower I was fishing from a boat on a small mill pond, about 100 yards from a house that stood on its edge. While watching the float on my line, some one closed the outside door of the house with a bang, producing a decided concussion on the air. As if a tree loaded with moisture had received a shock, so the rain drops fell on the smooth water all around at the same instant I heard the sound. So closely was the sound accompanied by the precipitation that it became evident to me at once that the concussion caused that short rainfall.

G. R. OVERHOKER.

Reamstown, Pa.

Florida Vegetation—Naphtha vs. Storage Battery Launches.

To the Editor of the Scientific American :

I noticed in your valued paper an engraving taken from a photograph of the banyan or rubber tree here on Lake Worth, and from the comments thereon I was led to believe that a mistaken idea prevailed among most northern people of the peculiar plant life which is met with here.

The fact of the proximity of the warm Gulf Stream makes the immediate coast climate remarkably uniform. Extremes of heat or cold are unknown, and a tropical luxuriance abounds on the hammock lands almost beyond belief to those who have only been familiar with northern Florida.

Cocoanuts or mangoes will not withstand frost, yet there are thousands of bearing cocoanut trees here now, and enough bearing mangoes to demonstrate the practicability of its extended culture, and extensive plantations are being planted.

Yet, strange as it may seem, the yellow pine, used so extensively now for lumber, does not seem to do so well here as in northern Florida or Georgia. Perhaps it is owing to the soil.

Have watched with interest the discussions of correspondents on jet propulsion. While I have nothing to offer in that line, I would like to inquire through your columns if electrically propelled boats can be run economically when near a station where batteries can be charged cheaply. Or will weight of batteries and expense of maintenance exceed that of steam or naphtha fitted boats or launches?

What can some one who is familiar with the subject tell about it?

W. H. SANDERS.

Lake Worth, Dade Co., Fla.

MR. GEORGE L. SEVEY, an ingenious marble cutter of West Somerville, Mass., has made a small operating engine composed of marble. It has a vertical piston and two side flywheels. The height is 23 inches and it is 10 by 20 inches square. There are one hundred pieces of marble, held together by 12 brass screws. The engine is operated by air pressure.

Teaching the Deaf to Speak.

The Volta Bureau of Washington has prepared a souvenir of the first summer meeting of the American Association to Promote the Teaching of Speech to the Deaf. The book deals wholly with the case of Helen Adams Keller, the wonderful child who at the age of eleven years has learned to speak and to write, although she is blind and deaf.

This child's progress was the subject of an essay at the last meeting of the association by Sarah Fuller, principal of the Horace Mann School for the Deaf, of Boston. The child was possessed of all the faculties and senses of a healthy child, so far as was known, until upon recovery from a serious illness at the age of eighteen months she was found to have lost her hearing and sight. In 1887 she was placed under the instruction of Miss A. M. Sullivan, who had been educated at the Perkins Institution for the Blind, in Boston. Under this instruction Helen developed with astonishing rapidity the genius which has since commanded the admiration of those interested in instructing the deaf.

In 1888 Helen paid a visit to the Horace Mann School. The interest that she then manifested in the children and in the course of instruction suggested to Miss Fuller that she could be taught to speak. It was nearly two years later, however, before any effort was made in this direction. Learning at that time that a deaf and blind child had acquired speech, Helen became anxious to learn to speak, and Miss Fuller was quite ready to undertake to teach her.

Miss Fuller's essay describes how she gave the child her first lesson. It was evidently a task requiring much patience, for Helen was obliged to learn how to use her organs of speech by feeling her teacher's mouth and throat, and determining by the same means the position of the tongue and teeth. She proved an apt pupil, and in a little while she was able to pronounce the vowels and to give utterance also to some of the consonants.

Having gone through this preliminary drill, the teacher shaped her lips for the vowel "a," and, with the child's fingers as guides, she slowly closed her lips and pronounced the word "arm." Without hesitation, Miss Fuller says, the child arranged her tongue, repeated the sound, and was delighted to know that she had pronounced a word.

Her next attempt at pronunciation was with the words "mamma" and "papa," which she had tried to speak before going to the teacher. The best she could do with these words was "mum-mum" and "pup-pup." The teacher commended her efforts, and in order to illustrate to her how the words should be correctly pronounced she drew her finger along the back of the child's hand to show the relative length of the two syllables, the child's other hand in the meanwhile resting on the teacher's lips. After a few repetitions the words "mamma" and "papa" came with almost musical sweetness from her lips.

There were nine lessons after this in which the child proved an ideal pupil, following every direction with the utmost care, and seeming never to forget anything told her. At the close of her lessons she used speech fluently. She received her first lesson March 26, 1890, and April 19 of the same year, while at the house of a friend, she related an account of a visit she had made to Dr. Oliver Wendell Holmes, in which her pronunciation was so good that there were only four words out of more than a hundred that the teacher failed to understand.

As part of this souvenir there are two letters wonderfully well written by the child, the first at South Boston, April 3, 1890, and the second at her home at Tuscumbia, Ala., October 20, 1890. A photograph of the child is also published in the souvenir.

Helen Adams Keller is the daughter of Major Arthur Henry and Kate Adams Keller. She was born at Tuscumbia, June 27, 1880.

Cement Testing.

In a paper on cement testing recently read before the Engineers' Club of St. Louis, it is stated that probably the cement testing laboratory at Berlin is that which enjoys the greatest confidence both of consumer and producer. In this laboratory it is usual to observe (1) the weight per liter, (2) the quantity of water required to produce plasticity, which varies with the density of the clinker, with the time of setting of the cement, and with its fineness, (3) the rise of temperature during setting, which varies with the amount of lime in the cement and with its fineness, but is also affected by the temperature, as cement does not set below freezing point, and (4) the fineness of the cement, which is of great importance, and finally the tensile strength both neat and made into cement mortar. If ordinary cement is sifted through a sieve having 30,000 to 40,000 meshes to the square inch, the residue remaining on the sieve is found to have little or no tensile strength. But if this residue is taken and reground, a cement will be produced superior to the original cement, as the comparatively large particles which remained on the sieve were the best clinker, which is most difficult to pulverize. These facts show that ordinary commercial

cement consists of cement and inert material, and very finely ground cement is weaker than common cement when tested neat, but stronger when made into mortar. The dividing line between true cement and inert material is not exactly known, but a sieve having about 35,000 meshes to the square inch is probably very near it. The first test of cement, therefore, should be for the percentage that will pass through such a sieve, which quantity will be the true cementitious material. On testing an English and a German cement, the author of the paper found that 10 per cent of the English cement and only 1½ per cent of the German cement were left on a sieve of 10,000 meshes to the inch, but on proceeding to use a sieve with 32,000 meshes to the square inch about the same percentage of both cements came through, and both therefore contained about the same quantity of cementing material. Hence a sieve of 10,000 meshes to the square inch is too coarse to properly gauge a cement.

Lasioderma Serricorne.

We submitted a correspondent's letter relating to the tobacco insect to Dr. C. V. Riley, of the entomological division, Washington, who replies as follows:

The sample of chewing tobacco which you sent a few days ago, with letter of inquiry regarding nature of injury and possible remedies, has been received. The injury is due to the beetle known to naturalists as *Lasioderma serricorne*. It is well known from the damage it does to dried tobacco of all forms. I inclose an account of this insect, together with the remedies that may be employed against it, from the pages of *Insect Life*:

"The insect is a species which is found all over the world, feeding in Cayenne pepper, spices, tobacco, and other pungent substances. It is *Lasioderma serricorne*. This injury to cigarettes has been observed in other localities, and samples of damaged goods have been sent to the division before. In tobacco warehouses in Baltimore particularly it has done much injury to cigars and cigarettes, preferring the latter. It is very abundant one year and then disappears almost entirely for a number of years. It is a night flier, and enters storehouses through open windows or cracks at night only. The best way to destroy the larvæ and eggs is to thoroughly steam all the tobacco. The steaming which is done in the preparation of cigarette tobacco is either not thorough enough or the tobacco is left for a longer or shorter time after steaming and before being made up, and in this interim the beetles enter it. Many precautions should be used. Cut tobacco should be kept in tightly-closed boxes when not in use. All manufactured cigarettes should be packed up at the close of the day's work, or if this be not possible, they should be closely covered with flannel cloth. All the windows in the building should be closed at night, and its general cleanliness should be carefully looked after. No dust heaps should be allowed to accumulate, and the walls should be kept whitewashed. The bisulphide of carbon would hardly be a safe or pleasant remedy in this case. It would be of considerable interest if you would carefully rear the insect and note its habits and natural history, particularly the length of time of the different larval stages and the number of annual generations."

To Keep Iron Pipes from Rusting.

A simple and economical way of tarring sheet iron pipes, to keep them from rusting, is as follows: The sections as made should be coated with a coal tar and then filled with light wood shavings, and the latter set on fire. It is declared that the effect of this treatment will be to render the iron practically proof against rust for an indefinite period, rendering future painting unnecessary. In proof of this assertion, the writer cites the example of a chimney of sheet iron erected in 1866, and which, through being treated as he describes, is as bright and sound to-day as when erected, though it has never had a brushful of paint applied to it since. It is suggested that by strongly heating the iron after the tar is laid on the outside, the latter is literally burned into the metal, closing the pores and rendering it rust proof in a far more complete manner than if the tar itself was first made hot and applied to cold iron, according to the usual practice. It is important, of course, that the iron should not be made too hot, or kept too hot for too long a time, lest the tar should be burned off. Hence the direction for the use of light shavings instead of any other means of heating.

Our Winters will Gradually Grow Milder.

A reverse of seasons is supposed to take place upon this earth once in every 10,500 years, due to the varying inclination of the earth's axis. About 1,500 years ago we entered the epoch of a more genial winter temperature, and if nothing happens to prevent, we may expect a gradual softening of our winter climate during the next nine thousand years, when another glacial epoch will begin. What sort of a country will this be in the year 11,500? Will it resemble Egypt, with remains of great buildings buried or sticking up out of the sand, and known to be more than 4,000 years old?