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734

UTILITY OF BEEKEEPING.

Insects Render Valuable Aid In Crop Cultivation.

Beekeeping is a valuable aid in the cultivation of fruit and seed crops. Insects which feed on nectar play an important part in the fertilization of flowers. Fertilization is effected in other ways, but the agency of insects is the more certain and efficacious, and no other insect is comparable with the honeybee in this respect.

A strong hive contains 10,000 bees in February, 15,000 in March, 40,000 in April and from 60,000 to 80,000 in May. It has been discovered by skillful observers that the average load of nectar carried to the hive by a bee is about three-tenths of a grain, so that the collection of one pound of nectar requires nearly 23,000 foraging excursions. By means of hives set on balconies it has been found that the daily increase of weight in May averages three and three-tenths pounds. Occasionally more than eleven pounds is gained in one day, and when the amount consumed by the bees and the loss of weight by evaporation are considered, it appears probable that the average daily quantity of nectar collected is not less than eleven pounds, which would load 250,000 bees. As a bee visits ten flowers on the average in collecting a single load, some 2,500,000 flowers are visited in one day by the bees of a single hive. An additional large number of visits is required for the collection of pollen. These figures explain why many trees and plants bear small crops in the absence of bees.

The bee is charged with various imaginary crimes. Its sting is formidable, but chiefly for the imprudent. It is accused of ravaging fruit, but its tongue is formed exclusively for the extraction of sweet juices, and its mandibles are unable to pierce the skin of a fruit. Grapes have been taken intact from the interior of a hive in which they had been allowed to remain four days. A grape which had been smeared with honey was licked clean, but was not injured. The bees inserted their tongues in pinholes made in the skin of a grape and extracted some of the juice, but they were unable to enlarge the holes. In some districts bees are menaced by insecticides intended for other insects. At Terricio, Italy, in 1907, all the bees were killed by spraying the olive trees with sodium arsenate mixed with molasses for the purpose of destroying the olive fly. —*Continued*

Coins of Aluminium.

After many months of discussion and experimenting the French government has decided not to adopt aluminium coinage. This is on the recommendation of the commission of scientists whom the government appointed to consider the subject. A certain number of aluminium coins were made as a test, but the lightness of the white metal, which was one of its chief recommendations, has condemned it. A five centime piece (1 cent) made of aluminium weighed only 1.9 grams as against 5 grams in bronze, and it is thought that a coin so light would slip through the fingers, especially the rough fingers of a workman. Tests are now to be made of bronze, containing 10 per cent of aluminium, which, if adopted, will reduce the weight by one-half. This combination of metals possesses a fine golden yellow color, and the coins made of it will therefore be perforated so that they may not be mistaken for twenty franc pieces.

Genius and Work.

Men give me credit for genius. All the genius I have lies just in this: When I have a subject in hand I study it profoundly. Day and night it haunts me. I explore it in all its bearings. My mind becomes pervaded with it. Then the effort which I make the people are pleased to call the fruit of genius. It is the fruit of labor and thought. —*Alexander Hamilton*

JAVA'S ISLAND OF FIRE.

It Is Really a Lake of Boiling, Bubbling Mud and Slime.

The greatest natural wonder in Java, if not in the entire world, is the justly celebrated "Ghoko Kamika Gumbo," or "Home of the Hot Devil," known to the world as the Island of Fire. This geological singularity is really a lake of boiling mud situated at about the center of the plains of Greboggana and is called an island because the great emerald sea of vegetation which surrounds it gives it that appearance.

The "island" is about two miles in circumference and is situated at a distance of almost exactly fifty miles from Solo. Near the center of this geological freak immense columns of soft, hot mud may be seen continually rising and falling like great timbers thrust through the boiling substratum by giant hands and then again quickly withdrawn. Besides the phenomenon of the boiling mud columns there are scores of gigantic bubbles of steam that fill up like huge balloons and keep up a series of constant explosions, the intensity of the detonations varying with the size of the bubble.

In time past, so the Javanese authorities say, there was a tall spirallike column of baked mud on the west edge of the lake which constantly belched a pure stream of cold water, but this has long been obliterated, and everything is now a seething mass of bubbling mud and slime.

THE HISTORY OF ZINC.

Introduced Into Europe From India Under Several Names.

Zinc was introduced into Europe in the seventeenth or eighteenth century by men from India. It was known then as calaem, splinter or tutanage and was the same metal which the famous alchemist, Andreas Lebarius, described in 1606 and which he declared consisted of silver, cadmia, mercury and arsenic.

Later in the sixteenth century keen competition was going on between the Portuguese and the Dutch in the Indian seas, and a Portuguese ship having been captured by the Dutch, her cargo of calaem or "Indian tin" found its way into Europe. Nobody at that time knew what it was, and it was a piece of this cargo that became the subject of analysis by Lebarius.

Zinc, it seems, was first produced in India, but soon became an important industry in China. The first Chinese book which mentions zinc, calling it yu-en, according to the Engineering and Mining Journal, is the Tienkonggong, or Technical Encyclopedia. China was the sole producer of zinc until the middle of the eighteenth century, disregarding a minute quantity of that metal which was occasionally obtained as a byproduct in the lead furnaces of Goslar in the Harz mountains. —*New York Post.*

Sanitary Concrete.

The sanitary properties of the reinforced concrete building should particularly appeal to merchants who contemplate the erection of a store building. Such a building is sanitary in the highest degree. It is damp proof and vermin proof. Therefore this type of construction means much to the merchants carrying goods which can be attacked by mice, rats, bugs, etc., and also merchandise which may be affected by dampness. There are no open spaces in the solid walls and floors within which vermin can hide, nor can they bore holes.

A Huge Scrap Heap.

The largest scrap heap in the world is in San Francisco, a relic of the great fire which followed the earthquake of April, 1906. It is forty feet high, a hundred feet square and contains 20,000 tons, all cut in equal lengths of eighteen inches and piled in one solid mass, with the sides as plumb and true as a brick wall. This is the only one of four heaps of equal size and proportions which remain intact in its original size and shape, the other three having been drawn upon as the material was needed.

How To Study

Many people think that after they leave school their education is finished, but in this they are decidedly wrong. When one begins business life he enters another school and constantly learns something new, as time goes on.

The successful man is essentially a student. In studying technical subjects the matter should be read and reread until the student fixes on his mind so that it can be recalled at any time.

Prominent electricians have told us that they have read certain textbooks many times, and it is this fact that has enabled them to become leaders in their profession.

True reading is not study. If a subject is worth studying at all it should be studied well, and not read superficially. Each reading makes a deeper impression on the mind, and if repeated often enough the impression becomes ineffaceable. Knowledge thus absorbed becomes a part of ourselves and no one can rob us of it.

How Animals Prefer Bath

Pigeons, larks and cockatoos like their baths in the rain. Game birds and poultry take dust baths. The common sparrow likes a dry shampoo in the dust and plunges in the water. Haploids soak themselves; elephants wash their calves with mud, then wash it off. Rhinoceroses, buffaloes, dogs, bears and tigers like to wallow; the equine tribe favor a roll in the sand; cats, mice and their respective relatives lick themselves clean; bats lick and scratch, and it is said that the continual scratching of monkeys is not so much in the search of parasites as a kind of self-cure-scratching.



Pinholes in Bronze.

An excess of phosphorus in bronze causes pinholes in the casting. The ideal condition in the use of phosphorus is when just the right amount is added to the bronze to remove the oxide present in it, and a small quantity only is needed for this purpose. Owing to the fact that the quantity of oxide in copper or bronze is always variable depending upon the manner of melting, etc., the amount of phosphorus to be introduced can only be approximated. The same rule holds true of all deoxidizing agents.

Cement For Meerschaum.

Stir very fine meerschaum chips with white of egg, or dissolve casein in water glass, stir in finely powdered magnesia and use the cement at once. It hardens very quickly.

The Hard Part First.

"I hear you've got a government job now," one man said to another. "The other answered gayly: 'That's what.' The first man gave an envious sigh and asked: 'Is it hard work?' 'Not after you get it,' was the reply."

Her Possessions.

"I have two lovely little puppies," said Mrs. Tawkey. "I have met your husband," replied the man. "Who is the other one?" —*Exchange.*

Strangers in Fez.

"The people here are charming," declared a foreigner in the Pall Mall Magazine. "During one's walks or through the town it is quite the exception to be spat at, as is often the case in other ultra-Mohammedan towns, and the crowd is, on the whole, merely smiling and inquisitive, like a crowd in Naples or any other south Italian town. Now and then some fanatic—generally an epileptic—will try to raise a disturbance and will be promptly removed by his friends—the Moors are kindness itself in the face of poverty or affliction—but, except for these and a few casual curses from the old and soured, the Christian dog may pursue his way in comparative peace, provided he does not attempt to enter a mosque or pass the barriers placed in front of those streets leading up to the tomb of Moulay Idriss, the founder and patron saint of Fez."

Dust Extractor For Coal Mines.

A new coal dust extractor, consisting of a combination of pressure air jets worked by electricity directed upon the surface to be cleaned in order to raise the dust and simultaneous withdrawal of the dust by suction, has been given a successful demonstration by a Scottish electrical engineer, following a series of experiments conducted during the past winter. The apparatus is designed to be operated either by electric motor or by compressed air. It is said it will soon be introduced in some of the coal mines of the Dunfermline district. —*Consular Report.*

New Waterproofing Material.

Seeking a waterproofing suitable for military cloaks as well as tents, French army officials have decided that acetate of aluminium is better than rubber, boiled linseed oil, insoluble gelatin, shellac or any other of the many materials to be had. M. Ballard adds forty parts of water to one part of commercial acetate of aluminium solution, and fabrics are soaked in the mixture for twenty-four hours, then dried in air. It is claimed that the cloth is not only made waterproof, but is left supple and sufficiently porous for air to pass through it.

CRYSTALLINE QUARTZ.

Material Extensively Used In Various Industries.

The production of crystalline quartz, quartzite not used in building and silt in 1910, according to Edson S. Bastin of the United States geological survey, showed a decrease of 53 per cent in quantity and of 22 per cent in value as compared with 1909, the total quantity produced in 1910 being 63,577 short tons, valued at \$193,757. These figures do not include the large amount of quartz in building, molding and glass sand, building stone, etc. Quartz of the kinds mentioned is used for a great variety of purposes, principally in the manufacture of wood filler, pottery, paints and scouring soaps. In pottery quartz serves to diminish shrinkage in the body of the ware; it is used also in many glazes. Quartz for these purposes should be nearly free from iron bearing minerals. Finely ground quartz is used in paints to increase the resistance of the paint to the weather. In scouring soaps and polishers ground crystalline quartz is preferred to silica sand not only because of its greater angularity, but because of its superior whiteness. Massive quartz, crushed and graded to various degrees of fineness, is extensively used in the manufacture of sandpaper and sand belts, as a scouring agent, with sand blast apparatus, etc. Much ground quartz is used in filters, and some of the most finely pulverized grades are used in tooth powders and in place of pumice as a cleaner by dentists.

Within recent years crystalline quartz and also sand have been used to some extent in the manufacture of silicon and of alloys of silicon with iron (ferrosilicon), copper and other metals. Ferrosilicon is largely made in the electric furnace by using coke to reduce the quartz to the metallic state and some iron ore or scrap iron to alloy with the silicon. Ferrosilicon has been employed in the manufacture of steel as a deoxidizer and to prevent the formation of blowholes in steel ingots. Quartz may also be fused in the electric furnace to make tubes, crucibles, and other articles which can be used for certain purposes in the chemical laboratory instead of porcelain and platinum ware.

BRICKLAYER'S HAMMER.

Improved Tool Is Provided With Detachable Peen.

That part of the bricklayer's hammer with which the bricks are chipped off, and which is known as the peen of the hammer, is liable to wear out before the rest of the hammer does. For this reason an inventor has devised a hammer in which the peen is made readily removable.

The way in which this is done is clearly shown in the illustration, a



HAMMER WITH DETACHABLE PEEN.

locking joint being provided between the peen and the hammer, which will stand the thrust when the peen is in use. The peen may be made of high carbon steel so that it will wear for a great length of time, while the rest of the tool may be made of an inexpensive low carbon steel. When the peen wears out it may be detached quickly and replaced with a new one.



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MONTREAL.

Economy of Concrete.

At a recent meeting of the Concrete Institute of London, held at the United Service Institution, E. R. Matthews in a paper on "Re-enforced Concrete Chimney Construction" stated that during the past seven years one American firm alone of Chicago has erected nearly a thousand concrete chimneys in America. The advantages were found to be that the cost is one-half as much as a brick shaft, there is a saving in space, there is an economy of materials, the brickwork at the base of a 300 foot shaft measuring about four feet ten inches, while a concrete shaft of the same height would have an outer nine inch wall and an inner five inch, with a four inch space between. A concrete shaft weighs less and has sufficient stability, there having been but one failure recorded due to faulty construction. It can be built in one-half the time required for a brick shaft, and once constructed the concrete shaft requires practically no repairs.

Wheat in Spain.

About 75 per cent of the total land under cultivation in Spain is given up to cereals. During the past decade the crop of cereals exceeded 3,000,000 tons. The land, however, is susceptible of a far larger production, and in fact enough wheat could be grown in Spain not only to exceed the consumption of its present population, but for a large export. There are vast tracts of arid land in the interior of the country which could be brought under cultivation by sinking artesian wells for irrigating purposes, for water is found in all parts of the peninsula at a small depth. That much has been done in this respect in recent years is evidenced by the fact that in 1906 the import of wheat and flour into Spain amounted to about \$21,000,000 and \$325,000 respectively, and in 1908 the import of wheat amounted to only \$2,900,000 and flour less than \$1,000.

The Deepest Well.

What is supposed to be the deepest boring in the world is at the little village of Czuchow, in Silesia, Germany, to a depth of almost a mile and a half below the surface. The bore is seventeen and one-third inches in diameter at the mouth and a little short of two inches at the bottom. The exact depth of the hole is said to be 7,348 feet. The experiments that have so far been made with the bore show that the temperature of the earth increases at the rate of 1 degree F. with each section of fifty-eight feet, or 1 degree C. for each 104.3 feet.

Noncorrosive Gunpowder.

An English inventor has brought out a kind of steel which resists the corrosion of smokeless gunpowder, the chief objection to the use of that form of powder for firearms.

Yet Both Made Hits.

Director—Say, my man, how is it that Shakespeare's statue is standing on the pedestal marked Scott? Attendant—He must have got his base on an error. —*Brooklyn Life.*

Legitimate Question.

Father—No, indeed! My father never heard me tell a lie! Willie—Was grandma as dumb as grandpa? —*Cleveland Plain Dealer.*