THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

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PLATINUM FOUND IN SOUTH AFRICA

Prospective brides and bridegrooms, chemists, scientists in general, and dentists and their patients will all be affected by the recent discovery of platinum in the Transvaal in quantities which are expected to be large enough to reduce materially the price of the precious metal. An authoritative account of the find and of its possibilities by P. A. Wagner of the Geological Survey and T. G. Trevor, Inspector of Mines, appears in the current number of the South African Journal of Industries.

The discovery was made last summer by Adolph Erasmus, a well-known prospector. He was looking for tin at the time, and was, in fact, going over a region that had been repeatedly prospected for both gold and tin without any platinum having been found. The discovery, says the article, "shows how largely blind fortune enters into these things, and how sometimes one discovery leads to another".

The farm on which the discovery was made had been proclaimed as a public gold field in the early days, but when all claims were abandoned it was deproclaimed. Subsequently tin was discovered on it, and a mine of that metal was worked for several years until the deposit was exhausted. Mr. Erasmus thought there might be more tin there and proceeded to make a few tests.

Almost the first panning yielded not only a few specks of gold, but a "tail" of grayish white concentrates that lagged behind the gold in the pan. Reasoning that since platinum is the only metal he had heard of that was heavier than gold, and that these residues must be heavier than the gold and therefore probably of platinum, Mr. Erasmus immediately communicated with his principal. Investigation showed platinum present in workable quantities, the first discovery of commercial quantities of the metal in Africa.

Several companies are now exploiting the deposit which is located in the Waterberg district, about 100 miles north of Johannesburg. The lodes are known to extend for a distance of 10 to 15 miles, with many surface outcrops. The ore averages about 9 troy ounces to the short ton, although some samples have yielded as high as 137 ounces. The yield generally is very variable.

Economically, the discovery is of great importance. Although almost indispensable in many chemical operations, and especially desired for further research in the fixation of atmospheric nitrogen, the cost of platinum is very high. More than half the total product is now used in jewelry since platinum rings and settings have become popular, and the demand from jewelers fixes the

price which has risen to about $100 an ounce, or about five times that of gold.

The pre-war price was less than half the present figure. The supply then came chiefly from the Ural mountains, but the war and the revolution in Russia stopped that source to a great extent, and other poorer sources in various parts of the world had to be depended on. South African platinum will, so the authors of this report declare, probably prevent any further rise in price and more probably will help to materially reduce it.

READING REFERENCE - Spurr, J.E. Political and Commercial Geology and the World's Mineral Resources. New York, McGraw-Hill Book Co., 1920.

PEANUTS AND PINS RIVAL TACKS AS BABY KILLERS

Peanut candy, watermelons, safety-pins, small toys, buttons, and pins, as well as tacks, are classed as baby killers by Dr. Chevalier Jackson of the University of Pennsylvania who removed a carpet tack from the lung of 8-months old Cletus Moore, the baby who raced with life from St. Louis to Dr. Jackson's operating room.

"Safety pins have killed more babies than firearms," said Dr. Jackson in an article contributed to Hygeia, the popular health journal of the American Medical Association. "Peanut candy is often fatal to babies. A string of beads is a dangerous plaything for children."

Scarcely a day passes but that some innocent little child is brought to the Bronchoscopic Clinic in Philadelphia. For years Dr. Jackson has been saying: "Poor little baby, why was mother so careless." The suffering babies are the victims of mothers careless through lack of knowledge.

At Philadelphia there is a museum of articles that have been taken out of baby lungs, throats, and stomachs. It includes over a hundred pins, dozens of tacks, half a glass eye from a teddy-bear, grains of corn, beans, peas, canna seeds, coffee beans, peanuts, over a hundredbuttons, beads and pieces of jewelry, dozens of coins, and over a hundred bones.

The monkey-like trait of babies, that of imitation, deserves part of the blame for the accidents, according to Dr. Jackson. Mothers who hold pins in their mouths unwittingly teach their babies to put things in their mouths.

"The frequency of foreign body accidents is much greater than is realized", said Dr. Jackson. "If any newspaper reader will watch, he will find scarcely a week goes by without note of one of these cases, which are often immediately fatal. And it must be remembered that relatively few cases, only those which are most spectacular, get into the papers."

The Libyan Desert, although practically barren of vegetation, supports numbers of birds, snakes, lizards, insects, foxes, jackals, and mice.

VOLCANIC LAVA TIDES MAY PREDICT ERUPTIONS

Announcement of the discovery of daily and monthly tides in the lava in the crater of Kilauea volcano in the Hawaiian Islands was made recently before the Washington Academy of Sciences by Dr. T. A. Jaggar, director of the Hawaiian Volcano Observatory of the U. S. Weather Bureau. The Observatory is located on Kilauea. Dr. Jaggar said the observations might be valuable in predicting future eruptions.

The liquid lava shows a twice-a-day fluctuation in level of from two to seven feet, a daily variation of three to five feet, and a monthly shifting of the time of maximum and minimum level. This would not be the case if the "Tides" were due to weather conditions which change irregularly, but it might be due, Dr. Jaggar said, to control by the sun and moon.

The hard lava floor of the crater also showed a daily change in level of about one foot, but the times of maximum and minimum were nearly opposite those for the liquid lava, the high level occurring in the morning in the case of the liquid and after midnight in the case of the solid lava during a period of two months last summer when observations were taken.

Seasonal tilting of the ground on which the observatory stands was also reported, the tilting causing a plumb line shift of from 15 to 25 seconds of arc. Seasons in which this tilting was least showed the least amount of volcanic activity and a decline of the lava column in both Kilauea and Mauna Loa. Since 1919 the winters have shown strong monthly tilts and strong lava activity while the summers showed a corresponding decline.

Dr. Jaggar said the daily tidal movement provides forecasting data from hour to hour, while the seasonal tides when fully worked out should assist in forecasting from week to week. A few years of observations should be sufficient, he stated, to determine the period of eruptivity of Hawaiian volcanoes, and to place it on a quantitative basis.

READING REFERENCE - Bonney, T. G. Volcanoes, their Structure and Significance. New York, G. P. Putnam's Sons, 1899.

Russell, Israel, C. Volcanoes of North America. New York, Macmillan Company, 1910.

FRANKLIN'S THRIFT

During "Thrift Week" we hear a great deal of Benjamin Franklin as the great exponent of thrift. Historians recall, however, that the great scientist-statesman was not always thrifty enough. In his refusal to patent his famous stove, he was wasteful of his own and the public's profit. He wished his ideas to be given free to the world and so did not protect his invention; an Englishman made some changes for the worse in the Franklin fireplace, secured a patent on it, and reaped a handsome fortune from the sales.

STARCH DISASTER SHOWS DUST DANGEROUS AS DYNAMITE

New means of preventing disastrous dust explosions were made possible by the government's study of the starch dust explosion at Pekin, Ill., which killed 42 persons and caused over a $1,000,000 damage.

Investigations just reported by David J. Price, engineer of the U.S. Bureau of Chemistry, make clear that this disaster was caused primarily by a small fire from an over-heated bearing of a starch conveyor. The damage from this fire was negligible, but it was sufficient to set off the starch dust which rose when a small starch wagon was dumped into a bin.

If the fire and explosion had been confined to this small bin the damage would have been small, though several nearby workers were burned. The great disaster came from the travel of the explosion through the dust cloud which existed all the way along the conveyors which carried starch from the bin to another building. It seemed unbelievable that the small amount of dust in a conveyor tunnel should have been enough to carry the explosion down through the basement, under ground for a considerable distance to another building, and there to set off the whole packing department. But the evidence was conclusive that the flame did travel in this fashion.

"Any dust which will burn in the air may become as dangerous as a high explosive," Mr. Price declared. Government engineers advise separation of buildings where dry combustible dust is handled. They point out that buildings with large window area are much safer if such explosions are likely to occur, because in case of explosion the windows are blown out and relatively little damage results to the walls and floors of the structure itself.

These results are applicable in any plant where powdered coal, ground starch, cocoa, spice, other fine combustible dust, or even metal dust are produced and handled. In such plants there is as much need for care as in dynamite or powder factories.

RESEARCH IS MOTHER OF INDUSTRY SAYS SCIENTIST

Research, research, and more research as the solution of industrial problems, is strongly urged in a statement prepared by Dr. A. D. Little, chemical engineer of Boston, for the Division of Engineering of the National Research Council.

"Research is the mother of industry," he declares. "Research needs the support of business men. It pays dividends. For example, last year, Bohr, the Danish chemist, published a work called 'The Theory of Spectra and Atomic Constitution'. This seems far removed from industry and from practical affairs. But Bohr's theory indicated that an unknown element should exist in zirconium-bearing minerals. Last year this element, since named hafnium, was discovered, and is estimated to be more plentiful than lead, tin, and many other materials of commerce.

"Three fundamental factors are involved in industry; capital, labor, and the creative mind. In any progressive civilization industry is constantly pushing its outposts forward into the new territory wrested from the unknown by its

advance guard, science. Science is merely information, so classified and organized as to be used effectively and at once, and information, to quote General Sheridan, is 'the great essential to success'. Advance information of the battle of Waterloo consolidated the Rothschild fortune. It is advance information that science offers to the business men of today.

"Research today is extending the boundaries of every field of human activity and thought. It is directing industrial expansion into new channels and new territories. We are, for example, about to witness revolutionary changes in the preparation and the use of fuel. Powdered coal has already established itself in engineering practice. Steam pressures have been raised in central stations to 500 pounds, and pressures of 1500 pounds are cautiously being tried.

"We may soon expect oxygen, the supporter of combustion, to be as cheap by the ton as coal. Petroleum is about to be raised to a new and higher plane of usefulness. Biological chemistry is contributing new processes and in alliance with medicine is conquering some of the most terrible scourges of the human race.

"Our prosperity in the past has been largely based on cheap land and superabundant raw materials. Today our civilization has developed such complexity that we cannot hope to maintain our position except through the assistance that only science can afford. The laboratory has become a prime mover for the machinery of civilization."

READING REFERENCE - Slosson, Edwin E. Creative Chemistry. New York, Century Company, 1920.

Woodruff, Lorande Loss. The Development of the Sciences, New Haven and New York, Yale University Press, 1923.

SIMPLE SCIENCE

By WOW

(WOW is a professor of chemistry at a large university.)

SUGAR

Most humans and others have a pancreas. This controls the amount of sugar we can digest. Some folks seem to have a lot of pancreases, especially young girls. We should be very careful not to injure our pancreases.

The ancients didn't have sugar, so they had to use honey. Dogs and horses and ants all like sugar, so I suppose we inherited our sweet tooth from the lower animals. The oldest man ever found was "Pithecanthropus erectus". He had three teeth, all sweet ones. No one seems to know just when sugar started, but some think it began in India.

There are many kinds of sugar, such as cane, beet, maple, white, brown, yellow, loaf, icing, etc. The first eight are found in nearly every home, except

maple. This is found in the country. It's just about the same as the other seven kinds, only it's colored with smoke, and tastes of maple trees. Therefore it's nicer.

Cane and beet sugar are used a great deal. Most people can't tell them apart, except grocers. They can just look at the name on the bags and tell at once. Another way to tell is to watch them being made.

In one case they squeeze the juice out of the sugar cane, and then purify and boil it down till they get nice crystals of sugar. In the other case they just chop the beets up and let the juice come out itself. It seems glad to do this, especially if you give it some water to slip out into. Then they do about the same as with the cane juice, and we get beet sugar. Hence there's really no difference between them.

The other five kinds are a little different. Some are colored. When the color is taken out there's no difference. The difference between loaf and icing sugar is because icing has a lot of starch in it, and loaf looks nicer for afternoon teas, and it doesn't spill so easily if you get nervous.

AUTOMATIC PLOW WORKS IOWA FARM

An automatic plow, independent of any human control as long as it is supplied with gasoline, working its way back and forth, night and day, across the level Iowa fields, is the ingenious invention of Prof. J. B. Davidson, of the agricultural engineering department of Iowa State College. Without a sign of a plowboy, the motor driven machine, built by Darrel B. Lucas, a student, turns over long neat rows of the black soil on the college farm at Ames.

The machine is not yet ready for exploitation, but Prof. Davidson claims that it has proven, by actual operation, that the principles of its construction are right. Built of odds and ends of farm machinery, it bears very little resemblance to an ordinary plow. It runs on two large wheels, which support the motor, one running in the furrow, to guide the machine, and the other running on the unplowed ground. Instead of turning around, like a man driven outfit, at the end of a furrow, an antenna-like affair hits the fence and a second plow, which has hung suspended out in front, drops down, the machine reverses, shifts over and starts back across the field with the other plow in the air ahead.

Prof. Davidson points out that $150,000,000 are spent each year for the operating expenses of plowing, and though, of course, the machine could not be adapted to all fields, there are great expanses of midwestern prairie land upon which a great saving could be made with this machine.

A Kansas City surgeon removed the following articles, weighing one pound and a half, from the stomach of a woman patient; 43 pieces of loops from spring mattresses, two door hooks with staples attached, four hairpins, and several other parts of springs. The patient made an uninterrupted recovery.

PREDICTS NEW SOFT DRINK, CASSINA FLAVOR

Perfection of new processes in curing cassina, a tea-like plant from which the Indians made a drink used in their religious rites, has resulted in the development of a delightful new beverage, according to George F. Mitchell, supervising tea examiner of the United States Bureau of Chemistry.

"Carbonated drinks made from the cured cassina will, in a very few years," Mr. Mitchell predicts, "become popular with the public because of its unique flavor, stimulating effect, and the cheapness with which it can be produced.

"Unlike tea, every individual leaf of the cassina plant contains caffein, the active principle of both plants, and all the leaves can be removed from the pruned branches with live steam instead of the far more expensive and laborious method of picking them by hand. Also the number of steps in the process of production can be reduced."

The work with the cassina plant has been conducted by Mr. Mitchell at a small factory equipped by the Government in South Carolina where three tons were manufactured during the experiments. A small quantity of this output was placed on the market to test its commercial possibilities.

Although it has only been in the past few years that any scientific interest has been shown in cassina, Mr. Mitchell explains that it is really not a new thing. A South American species of this plant has for years been made into a beverage which is the national drink of the South American countries. And even in the United States cassina is used in large quantities when tea and coffee are unavailable. Such was the case during the Civil War when the crudely cured leaves of the cassina plant were used extensively by the Confederate army and the Southern people to make a stimulating drink. Cassina grows abundantly over an area of approximately 40,000 square miles extending along the coast of the United States from the James River in Virginia to the Rio Grande in Texas.

Cassina mate, one of the products produced from cassina, resembles yerba mate so closely that a large potential field is opened up in South America for exploiting this new American beverage as an export product, Mr. Mitchell says.

READING REFERENCE - Hardy, Marcel E. The Geography of Plants. New York, Oxford University Press, 1920.

AN ELEPHANT'S AUTOGRAPH

The autograph of an elephant on the way to his own funeral, an event which occurred some million years or so ago has been found in Nevada. The footprints of the great beast are clearly seen as he made them when he plodded wearily along through the soft sand, subsequently hardened into enduring rock. That it was his last walk was discovered when the scientists excavated the rock and traced the footprints to where the fossil bones of this denizen of the forests of ancient times laid.

ANCIENT DRAWINGS FOUND IN AUSTRALIAN CAVES

Discovery of cave drawings made by the black aborigines of Australia, rivalling in interest those found some years ago in the caves of southern France, has been announced by Dr. Herbert Basedow at Adelaide, Australia, as the result of extensive explorations in central and northern Australia, according to dispatches published here. The older carvings were supposed to be fossils until Dr. Basedow had examined them.

A similarity between the system of geometrical and conventional designs and the hieroglyphics of ancient Egypt was pointed out by the discoverer. Bilateral symmetry often indicates the human form, and the line, the lattice and the cross are all used to represent human beings. The cross is the most sacred structure known to the natives and is produced only during their religious ceremonies.

The cave drawings are made with a pigment of ochre and fat and have endured for thousands of years, Dr. Basedow believes. Some of them relate legends, others give directions for the initiation ceremonies connected with fire-worshipping ritual and with ordeals, some of which are extremely cruel.

Dr. Basedow also has found that the blacks comprise all three of the main cultural divisions established for the fossil men of Europe. They use rough stones as implements just as they find them, or they chip them into some conventional shape, or they grind them to a fine edge as desired.

WAR DEPARTMENT PLANS INDUSTRIAL MOBILIZATION

Six months will be saved in the time needed for industrial mobilization in the event of another war by use of plans now being worked out by the War Department, Capt. H. F. Wilkins of the ordnance department told members of the American Society of Mechanical Engineers at a meeting of the Washington section. The cost of preparations in time of peace will be correspondingly reduced, he stated.

The new system consists in placing tentative orders with manufacturers for the materials it is believed they would be able to supply. The manufacturer then decides what additional machinery and material he is going to need, and makes tentative arrangements for securing it. For the purposes of the system, the whole country is divided into manufacturing districts, in each of which is a representative of the department who makes it his business to know the production capacity of the plants in his district.

If war becomes imminent word will be passed along to fill these tentative orders and as every man will know what to do and how to do it, it is expected that the production of munitions will get under way more smoothly and more rapidly than it did in the last war. A paper mobilization of material, to be carried out to the point where the movement of real material would be begun, is planned for the near future.

Major J. B. Rose of the ordnance department, speaking of the latest developments of artillery, said that new types of 75 mm. guns are being worked out which will have a greater range than the famous field pieces of the late war, without any sacrifice of mobility.

NEW SEA SOUNDING DEVICE MAKES CHARTS MORE EXACT

In order to determine the depths of the sea near our coasts with greater accuracy, the U. S. Coast and Geodetic Survey has adopted a new tube sounding device. The new machine is the invention of Commander G. T. Rude, chief of the Survey's division of tides and currents, and records of comparative tests show it to be more reliable than the tube hitherto used for this work.

The tube, which is a piece of 24 inch long brass pipe with a half inch bore, is attached to the sounding lead or weight. As the tube descends, water flows in through a small hole in the cap at the end of the tube compressing the air inside. The further down the tube goes the more the air is compressed.

Measurement of the space in the tube unoccupied by water when the tube reached the bottom, shows the amount of compression; from which the depth of the sea at that point can be readily determined. The difference in the Rude tube and the tubes hitherto used is that it is designed merely to prevent the escape of the water, while the tubes previously used have been designed to hold the compressed air as well.

The Rude tube is much simpler and less expensive in construction than the former tubes which have a delicate and complex spring valve subject to leakage and poor adjustment, making them practically worthless for soundings in water over 180 feet deep.

The tube method, it is claimed, is much more accurate for shallow waters than is the sonic depth finder, the new method of deep sea sounding by the measurement of the time between the transmission of sound to the bottom of the ocean and the recording of the return of the echo.

Sounding can be taken while the ship is proceeding at a moderate rate of speed.

GUAM COCONUT TREES MENACED BY INSECT

A destructive insect known as the Aspidiotus has attacked the coconut trees in the Island of Guam, according to a dispatch received at the Navy Department from the Naval Governor of Guam. Investigation reveals that the pest is found in numerous widely separated small areas.

The people of Guam depend on coconuts for food, lamp oil, vinegar and yeast. They also furnish food for pigs and chickens. Copra, a product of the coconut tree, is the only export of the island.

The Navy Department at Washington has taken the question up with the Department of Agriculture with the view of having entomologists sent to Guam as soon as possible to stamp out the pest.

It is expected that parasites will be used in the fight on the aspidiotus. These are its natural enemies and when released in sufficient numbers are expected to keep in check, if not exterminate the troublesome insect.

The natives are aroused to the necessity for taking immediate measures to stamp out the pest, and are cooperating with all local agencies, particularly the Agricultural Experiment Station in the Island to combat the evil. All coconut trees on the Island of Saipan, just north of Guam have been destroyed.

TABLOID BOOK REVIEW

THE HUMANIZING OF KNOWLEDGE by James Harvey Robinson. The Workers' Bookshelf. New York: George H. Doran Company. 50 cents paper bound.

Professor Robinson is one of the most stimulating minds of our generation and country. His "Mind in the Making" is one of the best sellers outside the fiction class. In this small but weighty volume he has emphasized the importance of the work that Science Service is doing, the awakening of public interest to the aims and achievements of modern science. As a historian Professor Robinson realizes that the most potent forces in the molding of civilization have been scientific ideas and scientific inventions and he is one of the leaders in the movement to close the chasm between the humanists and scientists.

MOTHER SEAL HAS TWINS AND BECOMES FAMOUS

The first seal twins ever known to science were recently reported to the U.S. Bureau of Fisheries. Commissioner Henry O'Malley was informed by Assistant Agent E. M. Ball of Sitka, Alaska, that a mother seal with two pups had been killed at sea twenty miles off Biorka Island.

The babies weighed five pounds, 11 ounces, and one pound, 8 ounces. One had a good coat of hair while the other was almost hairless. A normal seal pup weighs about six pounds and 12 ounces.

Only natives in need of food are allowed to kill seals at sea. In the days before Pelagic killing was made illegal the seals were threatened by extinction on account of the wholesale slaughter of females before they had a chance to raise families. Now only males are killed for fur and last year out of 32,000 animals taken only 80 females were included by mistake.

"BOTTOMLESS HOLE" WASTES $900

The county road commissioners have found a "bottomless hole" a short distance west of Sheridan, Michigan. At least they have decided that the sink hole they have been trying to fill up has no bottom, for after spending $900 buying dirt to fill in the hole they have been compelled to survey a new route around it. The $900 worth of dirt disappeared and the sink hole seems to be no nearer full than when the work was started. It is considered likely that the great hole is an opening into an underground river and that the dirt is washing out from below as fast as it can be filled in from above.
