SCIENCE NEWS

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INFLUENZA IN ALASKA

THE Alaskan influenza epidemic of early 1935 traveled as fast as the planes traveled. Influenza reached Fairbanks on January 15. There were 500 cases and five deaths, the latter due to post-influenzal bronchopneumonia. Nome came next. There is air travel between Nome and Kotzebue every ten days in winter. No one died in either of these towns but the sickness rate was extremely high.

On April 8, a party of three men left Fairbanks by air for Point Barrow, going by way of Kotzebue, where the epidemic was on in full force. On April 15, influenza appeared in Point Barrow. Fifteen persons, mostly old Eskimos, died in Point Barrow out of a total population of 300.

A party of Eskimos left Point Barrow for Wainwright by dog sled. Ten days later there was influenza in Wainwright. Most of the 200 Eskimos who lived there got it. None of them died, probably because each was required to remain in bed in his igloo until he recovered. Point Hope, another little town, had no visitors from the outside during that period and so had no influenza.

The doctor at Point Barrow collected throat washings from his influenza patients, preserved them in 50 per cent. glycerin, and sent them, on request, to the Johns Hopkins Hospital, Baltimore. Two Philadelphia physicians, sent by the University of Pennsylvania School of Medicine, flew to Kotzebue to collect serum and virus. They made the round trip of 11,000 miles in fifteen days and collected seventeen samples of serum. By the time the doctors reached Alaska, however, the disease was past its acute stage and no virus could be collected.

These two physicians, Dr. Horace Pettit and Dr. D. Sergeant Pepper, and another Philadelphia scientist, Dr. Stuart Mudd, tell the story of the Alaskan epidemic in the *Journal* of the American Medical Association.

A fourth investigator, Dr. Thomas Francis, Jr., has found that the Alaskan influenza virus is immunologically identical with the virus recovered by him from the Philadelphia epidemic of 1934–35. It is also identical with the British strain. The physicians conclude that the virus that has been the primary agent of human influenza in widely separated areas during recent years appears to be a single entity. It has been proved that both active and passive immunity against this virus can be established in susceptible animals. This, then, gives an encouraging outlook for the ultimate control of "this last and greatest uncontrolled pestilence."

POISONING FROM ROCK MUSSELS

MYSTERIOUS deaths that have sometimes followed the eating of rock mussels of the Pacific Coast have been traced to their true cause by the George Williams Hooper Foundation for Medical Research of the University of California, under the direction of Professor Karl F. Meyer and by Professor Charles A. Kofoid, of the University of California.

It is not the mussels themselves that are poisonous; it is "something that they ate." The blame rests with a species of one-celled animal, whose uncountable swarming numbers at times turn the coastwise waters red by day and fiery white by night—for the microscopic creatures shine with phosphorescent light when disturbed.

California rock mussels are black-shelled, orange-fleshed, delicious-flavored shellfish that grow abundantly in many places along the coast. Exceedingly good eating as a rule, they have occasionally given rise to very serious illness, marked by paralysis and sometimes ending fatally. These outbreaks of mussel poisoning apparently followed some natural cycle, but nobody could discover what it was.

Then Professor Kofoid, one of whose lifelong specialties has been the microscopic life of the sea, especially Dinoflagellata, notorious as causers of the luminosity of the ocean, noted a correlation between the mussel poisonings, which happened in 1901 during a remarkable outbreak of red water, and the swarming of one marine dinoflagellate, known as *Gonyaulax polyedra*. At his suggestion, the Hooper Foundation, with the aid of his graduate student, W. Forest Whedon, undertook a search for a dinoflagellate in the food of California mussels, whose abundance might correlate with the periodicity of mussel poisoning. Mr. Whedon's studies over several years definitely proved that another species, *Gonyaulax catenella*, swarmed when mussel poisoning prevailed. A toxic substance had been isolated previously by Dr. H. Sommer from the liver of the mussels and was later obtained from this luminous protozoan. It proved to be identical with that of the mussels in their toxic phase. The shellfish, which filter minute organisms out of the water for food, just as oysters and clams do, had "loaded" themselves with the poisonous protozoans.

The fact that the organisms shine at night like fireflies makes their detection easy. A convenient safety rule is, never use rock mussels for food when the water shines round them at night.

INDIUM ALLOY FOR USE IN SURGICAL CASTS

SURGICAL casts made of alloys of the rare metal indium have been suggested as a substitute for plaster casts as the result of recent researches by Dr. Sidney J. French, of Colgate University.

By mixing substantial quantities of bismuth and lead with smaller percentages of tin, cadmium and indium, Dr. French was able to obtain an alloy which has the very low melting point of 116 degrees Fahrenheit. The alloy is physically stable, lustrous and chemically resistant.

It is the figure of 116 degrees that attracts medical attention. Such a value lies in a neat position well above possible human bodily temperatures, but not high enough to cause injury to animal tissues or even serious discomfort.

The impregnation of cloth with the alloy is proposed. Equipped with such peculiar bandage material, heated just above 116 degrees, a surgeon could manipulate a broken limb after it was wrapped. As soon as the correct placement of broken bones was accomplished under the surgeon's hands, the attending nurse would promptly chill the bandage, thus making the cast perfectly rigid in solid metal.

Unfortunately the present cost of indium is too high for extensive use of the alloy. Nearly twenty per cent. of indium is required in the formula. Substantial reduction of costs may be possible, however, if real commercial applications develop. Other uses, including fingerprint and life-mask impressions, have been suggested.

This development is the outgrowth of the well-known principle that mixtures of metals—and of other solids—usually melt at lower temperatures than the separate components themselves. Somewhat similar mixtures, not including the indium, have been used for years in fusible plugs for automatic sprinkler systems.

The new surgical use for indium is described in *Industrial and Engineering Chemistry.*

LOSS FROM RUST

THERE is most alarming comment these days on the size of the public debt. It costs about a billion dollars a year merely to pay the interest on this loan. Few people, however, feel vitally concerned about the money lost because of the rusting of their property.

Dr. R. M. Burns, of the Bell Telephone Laboratories, points out, however, that this loss due to rust is approximately as large as the interest on the public debt. One of the most widely used rust preventives is paint, and 120,000,000 gallons are used annually; one gallon for every man, woman and child in the country.

In an article in *The Bell System Technical Journal,* Dr. Burns describes the various processes which occur when metals corrode. What finally happens is, of course, that the metal goes into chemical combination with something else and is thereby rendered useless.

It may seem a far cry from a rusty nail to the battery in a flashlight. But actually the formation of rust on the nail is, to a large extent, a result of the action of thousands of tiny electric batteries on the surface of the iron. Most school boys know that a battery can be made of an iron rod and a copper rod dipped into a solution of some salt or acid. If he has tried it he knows also that, as the battery is used, the iron is gradually destroyed.

The same process occurs on the surface of the metal. The metal itself and some speck of impurity on its surface are "immersed" so to speak, in a film of moisture taken from the air. The metal and the pieces of impurity are, of course, an electrical contact so that the microscopic batteries run continually and the iron is slowly but surely eaten up. It is largely for this reason that iron rusts slowly, if at all, when the air is very dry.

If a large current is drawn from an ordinary dry cell the cell gets weak. It is said to be "polarized." A thin layer of some material forms on one or both of the electrodes of the battery and it stops working. This is bad when it happens in your flashlight but is just what scientists want to occur in the tiny corrosion cells on metal surfaces. Anything that can be done to make these cells polarize retards corrosive action. For this reason certain substances called "passivators" are added to the water in air-conditioning equipment to prevent rust formation.

SUN RAYS USED TO MAKE COLD

How sun's heat is utilized to give refrigerating cold is revealed in a U. S. patent recently granted to a New Jersey inventor. The patented invention is literally a "sun-cooled" refrigerator and may form part of an air conditioning installation.

Solar energy operates it, instead of electricity, and the hotter the sun the quicker are freezing temperatures obtained. By means of a thermostatic control it can be set to maintain a selected low temperature. "The object of the invention," states the inventor, "is to provide a cooling system . . . which may be operated without fuel cost and in sections having no available mechanical heat source other than the sun's rays."

Significance may be attached to the fact that the patent is assigned in part to a resident of Miami Beach, Florida, a region where sun rays are hot and plentiful and such a sun-operated refrigerator could be used practically all year round.

Briefly, here is how sun's heat plays its part in producing cold:

Through coils circulates a solution of water and ammonia to and from a tank. The sun's heat absorbed by the coils causes this circulation, and at the same time raises the temperature of the solution to the point where the ammonia boils off as gas.

The ammonia gas is then collected and liquefied in a condenser from which it flows through pipes to an evaporator. This is a tank-like structure containing hydrogen gas, and corresponds to the cooling coils in an ordinary refrigerator.

On evaporation the ammonia extracts heat from the space (which may be the inside of a refrigerator) surrounding the evaporator, causing the temperature to drop and thus effecting refrigeration. Hydrogen gas is put in the evaporator because the liquid ammonia evaporates more quickly in an atmosphere of hydrogen and gives faster cooling.

The cool mixture of hydrogen and the evaporated ammonia now flow from the evaporator to an absorber where the ammonia is separated from the hydrogen gas by absorption in water. The hydrogen flows back to the evaporator for further duty, while the water containing the dissolved ammonia travels to the sun-heated coils in the solar heater. Here the ammonia is again boiled off, then liquefied, evaporated and dissolved in water as before.

Once started this cooling cycle goes on continuously as long as the sun heats the coils.

A LOUDSPEAKER BURGLAR ALARM

A SIMPLIFIED burglar alarm that "hears" the burglar before he makes a sound, and goes off even before he can get to his safe-cracking tools, forms the subject-matter

of a patent recently granted to a New Jersey inventor. So sentitive is this alarm that should the burglar change the position of the tiniest object within the vault or vault room, a warning gong rings and the police dash to the scene.

A conventional loudspeaker operated by a special electric circuit serves as the "ear" of this ingenious alarm. The vibrating diaphragm of the loudspeaker sets up sustained, silent, air vibrations within the interior of the vault. Connecting the loudspeaker to an electrically operated gong-system is a balanced electrical "bridge." When setting the alarm system to safeguard the vault, this bridge is adjusted or balanced so that no current can flow from the loudspeaker circuit over the bridge to the gong-operating circuit.

In this condition, the loudspeaker diaphragm produces constant vibrations within the vault or room interior and the alarm gongs are silent. But let some one open the vault room door, step into the interior, make a tiny hole in one of the walls, or as much as change the position of an object in the room, and the nature of the air vibrations is immediately disturbed. Such disturbance breaks down the balanced set-up of the bridge, and starts the alarm circuit where it is detected, amplified and sped to a relay which works the gongs.

The inventor claims that his protective alarm is much simpler than the present-day systems used in banks, which for complete protection require specially designed locks and switches in the doors to control some alarm device, as well as alarm system networks embedded in the vault walls and sound pick-up devices in the safes to detect boring and tapping noises. His system, he says, is even more sensitive since it does not rely on the detection of any noise made by the burglar. Patent rights have been assigned to the Bell Telephone Laboratories, Inc.

ITEMS

AT Devils Lake, N. D., there was established a winter-temperature record that probably has no parallel in the weather history of this country for a first-order Weather Bureau station. At this place the temperature went below freezing on November 27 and did not thereafter rise to the freezing point until March 1, a period of 96 days. For 37 days, January 14 to February 19, there was only one day on which the thermometer registered as high as zero, while the week ending February 17 had an average temperature of 28 degrees below zero; the average for 2 months—January and February—was 13 degrees below zero.

"WHITE as death" takes on new meaning, in experiments with plant cells and ultra-violet rays performed by Dr. B. Luyet, of St. Louis University, and his collaborator P. M. Gehenio, of the Biodynamica Laboratory, They found that when the outer skin cells of an onion pass from life to death their absorption for the ultra-violet rays is lost. Living cells are black in an ultra-violet photograph; dead cells come out white. Transparency to ultra-violet rays is now used by the St. Louis investigators as a method of diagnosis of death in their further study of the physico-chemical structure of living and dead matter.

FROM a few seeds, found by chance in a fruit of the normally seedless-type Washington navel orange, a new orange variety has been originated in the Citrus Experiment Station of the University of California, and is now being offered for commercial growing. Dr. Howard B. Frost states that the trees will set and mature larger crops in some of the drier citrus growing regions than are possible with the wholly seedless Washington navel oranges. Because of the chance finding of the original seeds, the variety has been called Trovita, which is the Esperanto word for "found." Dr. Frost also describes three new citrus fruits, two of which are hybrids between separate varieties of mandarin oranges, and the third a hybrid between satsuma and a mandarin.

THE "motor" in the experimental rocket of Professor Robert Goddard yields over 200 horsepower per pound of weight, according to his new report on research progress issued by the Smithsonian Institution. Speeds as great as 700 miles an hour are developed with the Goddard rocket. By comparison the motor of a typical light motor car weighs seven pounds of engine for each horsepower developed. Modern military aircraft engines have one and a half pounds of motor for each generated horsepower. Special aircraft motors like those of the Italian racing planes have cut weight so that they need only three quarters of a pound of motor for each horsepower. The new high-speed streamlined trains powered by Diesel-electric have motors weighing ninety pounds for each horsepower they develop.

"WHEN the problems of life adjustment become too great for the individual to solve, mental disability may step in as nature's way of calling a halt," Dr. C. M. Hincks, director of the Canadian National Committee for Mental Hygiene, told the Royal Canadian Institute. Viewing mental disabilities from the psychological standpoint as the result of inadequate methods of meeting the demands of life, Dr. Hincks pointed out that "such mental ailments may in reality be beneficial as they represent nature's way of working toward cure by giving the individual a breathing spell before he makes another attack upon his problems. Of course," he added, "such mental disorders, while protective to a degree, may go too far and finally end in the permanent disruption of the personality."

A GIGANTIC engineering project which will link Denmark with Sweden with a 16-mile long bridge, provide a super-high-speed highway across the island of Zealand on which Copenhagen is situated, and also span the Great Belt separating Zealand from Funen and the rest of Denmark, has been proposed by three Danish construction firms. The Danish parliament is reported to be considering the plan with favor, although its total cost will be 628,000,000 kroner, or approximately $150,516,000. Construction would employ 12,000 workmen during a ten-year period. Especially favored by Scandinavian industrial and business circles is the 16-mile long bridge which would join Copenhagen and Denmark and Malmoe in Sweden, across the Ore Sund. Its estimated cost of $33,744,000 would be borne jointly by the two countries.