SCIENCE NEWS

Science Service, Washington, D. C.

DISCOVERY IN CALIFORNIA OF IODINE

IODINE has been discovered in paying quantities in southern California. This comparatively rare chemical element has long been controlled by a South American monopoly which regularly maintains a "pegged" world price on the commodity at a high level. Industries concerned with an iodine supply during possible future war blockade are much interested in the local prospects.

Some time ago Los Angeles petroleum chemists, analyzing brackish waters from oil wells near Long Beach, California, discovered iodides in commercial quantity. So great is the mass of worthless salts associated with the iodine, however, that difficulty has been experienced in extraction of the desired product. At least one company, however, has attained some success with the probblem, and California iodine is appearing on the market.

One of the favored methods of manufacture involves the treatment of the brine with nitrous acid which drives the iodine out of its salty compounds and permits it to be absorbed in activated charcoal much as war gases were caught in gas masks. Distillation of the loaded charcoal yields the precious product, which commands about four dollars per pound.

Iodine holds a queer economic position in chemical industry. To be sure, it goes into drugs, disinfectants, a few dyes, photographic supplies and a host of minor applications. Apparently nobody uses it in huge quantities, though very many persons require small quantities of the substance. Accordingly no one is seriously embarrassed if a monopoly charges several prices for the supply. The South American producers could furnish a very much larger quantity than that now marketed, but prefer to restrict trade and charge a high toll.

As yet the southern California production is not large enough seriously to threaten the monopoly, but with extension of oil drilling operations it is hoped that the business of producing iodine may be brought down into the domain of the law of supply and demand.

Iodine has two inexpensive chemical brothers, chlorine and bromine, which have taken over most of the large-scale duties which manufacturers might well have assigned to the more expensive element. Iodine is a solid, rather than a fuming liquid like bromine, or a corrosive gas like chlorine. There are accordingly many situations where chemical manufacturers would find it superior in technical use. As long as iodine is a hundred times as costly as free chlorine, and fifteen times as expensive as bromine, it can hardly make much industrial progress.

CONTROL OF THE JAPANESE BEETLE

WILD carrot, hated as a noxious weed by farmers and dairymen all over the country, has suddenly found a useful job. It affords a home and food to an insect newcomer brought to America from Japan to fight one of the most ravaging of pests, the Japanese beetle.

Two Bureau of Entomology workers, J. L. King and J. K. Holloway, describe the new insect ally of man and tell of the efforts, finally crowned with success, to get it firmly planted in its new home. They have found that the adult insects, which are little wasp-like creatures, make themselves at home in the flowers of wild carrot, feed there, and will not take kindly to any other plant. So it appears that a hitherto useless weed will become a necessary agent in combating Japanese beetle.

When the female of the new insect ally is ready to lay an egg, she locates the burrow where the grub of the Japanese beetle lurks and feeds. How she finds the buried grub is still a mystery; apparently she locates it by sense of smell.

Then she burrows down to the grub, and after stinging it into temporary insensibility, lays her egg on the underside of its body. The grub recovers from the sting and goes on feeding, but the egg, still attached by a kind of natural mucilage, finally hatches out.

The larva of the wasplet bites hold of the grub's body and sucks and sucks, growing bigger and bigger. At last the grub gives up the struggle and dies, whereupon the larva stops sucking and begins to chew, soon finishing off the carcass.

Then it spins a loose web of silk in the burrow and goes to sleep in this cocoon, emerging finally as a full-grown adult. The males emerge a few days before the females, so that when the latter appear above the surface their prospective mates are there on the lookout for them.

This early mating is an advantage in the propagation of the species, and is especially helpful to the entomologists who want to catch the insects and transplant them into other beetle-infested areas, because it can safely be assumed that every female found feeding in the wild carrot flowers will soon be ready to lay her eggs.

The insect was discovered in Japan, Chosen and China some years ago. Efforts have been under way for a decade to get it established in the beetle-infested parts of the United States, but it is only now that the Bureau of Entomology has become sufficiently well satisfied with the results to report success. Over 140 colonies of the insects have been released, mostly in the area around Philadelphia. It is expected that further work will spread the little insect to all parts of the Japanese beetle territory.

DRUGS FOR MALARIA

AT the Wellcome Chemical Research Laboratories, London, where remedies for tropical diseases are constantly under investigation, Dr. T. A. Henry and associates are taking advantage of a fact discovered many years ago, that birds as well as men are subject to malaria. So birds are being tried out as experimental animals for proposed new malaria cures, in place of the time-honored guinea-pigs, rabbits and dogs.

Although quinine has been the standard remedy for malaria ever since the Spanish missionaries learned its use from the Peruvians three hundred years ago, until within the last few years few efforts have been made to improve upon it or to find other tropical drugs that might be even more efficacious. Now investigators are at work on the problem from both these angles.

One of the promising chemical derivatives of quinine, Dr. Henry states, is an oxidation product, quitenine. It has no effect on malaria, but two of its compounds, the butyl and amyl esters of quitenine, are vigorous in their action against the parasites. However, the most promising derivative yet tested is the reduction product, hydroquinine.

A number of native malaria "cures" from different parts of the world are also under investigation. Alstonia bark has long enjoyed a high reputation in native medicine in Africa, the Pacific islands and Australia. Akuamma is another African remedy of high repute. Greenheart bark is favored by native doctors in British Guiana. Alkaloids have been isolated from all of these, but only those from Alstonia have shown any activity in bird malaria.

FOOD VALUE OF THE SWEET POTATO

SWEET potatoes are of higher food value than white potatoes, contrary to common belief. That the protein ipomoein of the sweet potato is richer in the nutritionally-essential amino-acids that compose proteins than the protein obtained from the white variety, has been shown by Dr. D. Breese Jones and his collaborators in the Bureau of Chemistry and Soils of the U. S. Department of Agriculture.

Proteins, those complex compounds of nitrogen, are a necessary constituent of any diet. Ordinarily we obtain our greatest amounts of these from meat, eggs or milk. Potatoes and sweet potatoes are more important as sources of starch or fuel-energy-giving material, as are also the cereal foods.

Potatoes of both kinds, however, contain proteins that are superior in nutritional quality to those of corn and white bread. They contain a greater proportion of the essential building materials for human nutrition.

The sweet potato has a further advantage. Dr. Jones has isolated and studied protein from seven or eight varieties. Not all of the nitrogen in white potato is due to protein, but to other substances of less food value. These are not found in the sweet potato.

The sweet potato is also very satisfactory in regard to its content of the essential vitamins. The common potato contains less vitamin A. Thus the sweet potato has much to recommend it as a balanced food.

The potato has been claimed by Dr. M. Hindhede, of Denmark, as the perfect food. The sweet potato is largely unknown in Europe though it was probably introduced there a hundred years before the common "spud." It is even mentioned in Shakespeare. It looks as if the Danish enthusiast might have to transfer his attention now to the all-American product.

Sweet potato flour can be added to wheat flour in making bread, with satisfactory results. A process has also been worked out by the Bureau of Chemistry and Soils for making syrup from sweet potatoes.

Sweet potatoes form one of the chief vegetable foods in the southern states. The Department of Agriculture suggests that a larger percentage of the crop than at present might be fed to farm animals as it constitutes a cheaper and more productive source of carbohydrate, or fuel-energy material than corn as a supplement to such protein concentrate feeds as cottonseed, peanut and soybean meals. The sweetness is due to the action of diastase, a substance present which changes the starch into sugar in the process of cooking.

A METEOR SHOWER SEEN FROM A SHIP AT SEA

AN "immense shower of meteors," or shooting stars, coming as fast as 12 to 15 a minute, was observed in the early morning hours of November 17, from a ship in the Atlantic Ocean near Porto Rico by Second Officer G. T. Bieling, of the American steamer *Annetta*. One was a brilliant fireball, that exploded in a flash so bright that an excellent flashlight photograph could have been taken by its light. This body left a luminous trail visible for 25 minutes afterwards.

In a report of the occurrence to the U. S. Navy's Hydrographic Office, Mr. Bieling said that the display lasted from about midnight, eastern standard time, to dawn. Their general course was from east to west, and they covered all parts of the sky. The greatest numbers of shooting stars were seen about 3:40 A. M., eastern standard time. This was the time of the regular November meteor shower, known to astronomers as the Leonids, because they seem to radiate from the constellation of Leo, the lion. Great showers of Leonid meteors were seen in 1799, 1833 and 1866. Another was expected in 1899, but failed to materialize, because the stream of meteors had been switched aside by the gravitational pull of Jupiter.

Astronomers have recognized the possibility of another great shower in November in the next few years, and thought that a good display this year might be a foretaste of such a shower. Generally cloudy weather over the United States, however, prevented extensive observations, though a few astronomers, especially in the Middle West, reported very large numbers on the early morning of the seventeenth. This was a day or so later than the usual time of maximum.

Mr. Bieling's report indicates that the Leonid shower this year was even greater than was supposed at the time. It is hardly likely that the maximum shower of Leonids would come as early as 1930, so the great cluster of Leonid meteors is probably approaching the earth's orbit. If this is the case, the next few years should see increasingly greater showers, with a really magnificent one about 1932 or 1933.

SYNCHRONIZED BROADCASTING

A DEMONSTRATION of the success of synchronized broadcasting—that is, broadcasting by two different stations of the same program on the same wave-length,

is afforded by two Iowa stations that have just completed six months of such operations. The stations are WHO, Des Moines, and WOC, Davenport. Glenn D. Gillett, engineer in the Radio Development Department of the Bell Telephone Laboratories, has just made a full report of the technical features of the system. He supervised its installation.

The stations are operated by the Central Broadcasting Company, of Iowa, and until last winter they shared time on a frequency of 1,000 kilocycles. The two cities are about 153 miles apart. Each station could only give effective service within a radius of about 50 miles, so neither city was able to receive satisfactory service all of the time, even though both stations might be broadcasting the same program.

Without special means of control, two stations can not keep on precisely the same frequency. They may keep close enough to the exact frequency assigned to satisfy the requirements of the Radio Commission, but very slight differences between them cause the two sets of waves to interfere, with disastrous results for the listener.

Since June 9, WHO and WOC have been synchronized, with the result that about 1,000,000 people, who formerly received adequate service from these stations about half the time, now receive it all the time. This is accomplished by means of a newly developed crystal control that is much more precise than older devices of the same kind.

However, it is not possible, even with this, to maintain absolute synchronism all the time, so a special listening station was established about half way between the two cities. WHO is the standard, and the monitoring station picks up the broadcast program, whence it is sent back to WOC by telephone wires. When WOC begins to vary from synchronism, this received program becomes slightly fainter, and the operator readjusts the transmitter. The adjustment is so delicate that a complete revolution of the control dial varies the WOC carrier frequency by but one part in a million. While broadcasting, an adjustment is made every 15 minutes.

Other broadcasters are also conducting experiments with synchronized broadcasting, and experts expect that it will soon come into general use. Thus a number of frequencies will be freed for other broadcasters, so that the crowded condition of the ether will be partly relieved.

ITEMS

SEVERE earth vibrations, known as "microseisms," which occurred for several days beginning on December 14, seem to be associated with the area of low atmospheric pressure that was travelling up the Atlantic coast at the time. The Rev. F. W. Sohon, S.J., in charge of the Georgetown University Seismograph Station, said that the vibrations were very marked, and would have prevented a satisfactory record of a real earthquake if one had occurred then. He stated, however, that while severe they were not extraordinarily so, but that they had often been observed in the past, of even greater intensity. He cited the opinion of his predecessor, the late Rev. F. A. Tondorf, S.J., that the low pressure area produces a shaking of the entire coast, which is recorded on the sensitive seismograph. Microseisms differ from earthquakes in that they are continuous, while the actual earthquake record is separated into well-defined phases. The microseism vibrations have a period of four or five seconds, while the earthquake waves are much longer.

THE four meteorological stations which the Sven Hedin Asiatic expedition established in the interior of Asia are being operated now by Chinese investigators. These stations, the only ones of their kind in an area as great as the continent of Australia, are gathering much information about the exchange of air currents between the polar regions and the equator. Three years ago, Dr. Hedin established the stations, and the meteorologists of his expedition started the work of sending up balloons filled with hydrogen gas, which were watched by telescopes. By this method, the air currents are being charted. Chinese students who accompanied the expedition were taught the methods and last year Dr. Hedin presented the stations, fully equipped, to the Chinese Government on condition that the service be maintained.

CHICKENS can now be protected from fowl pox, a highly infectious disease that often plays havoc with flocks, by a new vaccine made from pigeons. The vaccine was developed by Captain T. M. Doyle, of the Veterinary Laboratory, British Ministry of Agriculture. Fowls treated with it acquire immunity against fowl pox both under laboratory conditions and also in ordinary commercial practice. The immunity is fully established about the fourteenth day after inoculation. The vaccine does not give rise to any loss of condition or constitutional disturbance, nor does it seem to interfere with egg production. During the past six months, 50,000 doses of the vaccine have been given to infected fowls. The results were all excellent except in one case, and in that case it is just possible that the fowl was suffering from some disease other than fowl pox.

OF the women injured in industrial accidents, the greatest numbers are in the younger age groups, the U. S. Women's Bureau has found from a study of cases receiving employees' compensation in eight states. In Maryland, over 40 per cent. of the compensation claims allowed during one year were for accidents to young girls under 21 years of age. This number is out of proportion to the number of that age employed in industry, for census figures show less than 21 per cent. of employed women in Maryland to be under 20. In other states the proportion of injured under 21 years run from 25.5 per cent. in Massachusetts, to 37 per cent. in Georgia. Although fewer girls than boys were hurt, the proportion of young people was higher for the women. Young people were most often hurt by machinery; older ones by falls. The most serious injuries occurred in the laundry industry.