SCIENCE NEWS

DRUG ADDICTION IN THE UNITED STATES

Science Service

THERE are now probably not more than 150,000 drug addicts in the United States, and their number is decreasing, according to a report just published by the U. S. Public Health Service. This report is the result of a study of the extent and trend of drug addiction in the United States made by Dr. Lawrence Kolb and A. G. Du Mez, pharmacologists of the Public Health Service. It finds the peak of drug addiction was reached about 1900, when there may have been more than 250,000 addicts, and that the number is now steadily on the decline.

The estimate is based on the findings of numerous investigators and the reports of physicians and of addiction clinics during the past 25 years. The highest estimate, made in 1915, gave a total of 269,000 victims. The lowest, based on the experience of the army draft figures, gives a total of 99,500. The former was made in the state of Tennessee and is believed to have been too high, since investigators found that there were proportionately more addicts in the south than in the north.

The reasons for the conviction of the investigators that drug addiction is decreasing are given as the increasing efficacy of measures for the control of the drug trade, the prohibition of imports of smoking opium and the increasing caution exercised by physicians in prescribing habit-forming drugs.

Estimates of the maximum total number of addicts are also derived from the known amount of drugs imported, and the report states that "to supply with their daily dose the large number of addicts asserted by some to be residing in this country would require enormous quantities of narcotics—quantities far in excess of those imported at the present time or during any period in the past!"

The period of the greatest importation of opium per capita was the decade ending with 1900. Assuming that all of it was used to supply addicts with either opium or morphine, the total number of victims could not have been more than 246,000. The report adds that the substitution of heroin for morphine would only increase this total by 12 per cent., and the imports of opium at present are less than one fourth that of 25 years ago. The importation of smoking opium is forbidden.

As to cocaine, the report states:

"The amount of cocaine produced in the world as well as that imported into the United States has always been small in comparison with opium. The number of addicts in the United States using cocaine alone, based on legitimate importation and assuming that all the coca leaves and cocaine imported annually was used for the satisfaction of addiction, could never have been more than 18,300."

There are more addicts in prison at present as compared with former years, but this the investigators believe to be due to rigid enforcement of recent laws and not to any increase in addiction, since they hold that the present known importations are hardly more than the legitimate needs of medicine. Prison addicts are also thought to be due to the increase in the delinquent type of addict as compared with the normal individual who became an addict from medical use. Few cases of recent addiction, the investigators say, can be attributed to the prescribing of the drugs by physicians.

From the trend which narcotic addiction in this country has taken in recent years as a result of the attention given the problem by the medical profession and law enforcement officers, it is believed that we may confidently look forward to the time, not many years distant, when the few remaining addicts will be persons taking opium because of an incurable disease, and addicts of the psychopathic, delinquent type who spend a good part of their lives in prison.

LIQUID AIR FOR TREATING OAK POISONING

Science Service

LIQUID air as a remedy for poison oak troubles is the recent discovery credited to George F. Nelson, technical expert in the Gilman research laboratory of the University of California. Results of the new treatment have proved so remarkable that the university infirmary is now using about twelve gallons of the frigid liquid per month. The Berkeley hills are infested with the notorious western poison-oak (*Rhus diversiloba*), the bane of numerous lovers of the outdoors. Acting much like its ill-reputed eastern cousin, the poison-ivy, this plant has always been a great disturber of peaceful student life.

By the new technique a wad of cotton is soaked in liquid air, thereby being chilled to a temperature of about 300 degrees below zero Fahrenheit. It is now dexterously rolled over a blistered poisoned skin for a time just long enough to freeze a very thin layer, after which the pustules and itching are said to disappear promptly. The treatment seems also to be promising in cases of eczema and particularly with ringworm.

Years ago federal experts developed satisfactory means of prevention of oak- and ivy-poisoning, but found no cure. The poison is a non-volatile oil which is easily rubbed off from the leaves of the plants upon the skin of the victim. Following its slow absorption an acute irritation is set up just beneath the skin. If a sensitive person is forewarned he may readily eliminate the danger by dissolving the oil in a grain-alcohol wash, to which lead acetate, a chemical obtainable at any drug store, is added. The lead acetate, dissolving in the alcohol, gains direct access to the poison, which it chemically destroys. A final brisk treatment with strong soap and water eliminates all residues.

Liquid carbon dioxide, cheaply obtainable in the ordi-

nary market, was tried at Berkeley in place of liquid air, but so far without success. The temperatures secured with carbon dioxide would hardly attain a value much lower than 100 degrees below zero Fahrenheit. Liquid air at present is not found in ordinary retail trade, and usually is obtainable only on special order at a cost of several dollars per quart. It could be materially cheapened if demand arose for distribution in quantity.

FOOD RESOURCES OF THE TROPICAL ISLANDS OF THE FAR EAST

Science Service

LAND enough to supply all the food wants of Japan, China, the Philippines and other countries in eastern Asia exists in the tropical islands of the far east, Dean E. D. Merrill, of the College of Agriculture of the University of California, told members of the Pacific division of the American Association for the Advancement of Science, at the recent meeting at Stanford, California.

Borneo, Sumatra and New Guinea, each of them larger than Japan proper, have a combined population of less than 9,000,000 as against 70,000,000 persons in Japan. Java supports a population half as large as that of Japan on a territory only about 30 per cent. as large. The future food supply of the east will have to come largely from these great areas of untilled land in the tropics, Dr. Merrill said.

Even in China there is room for a considerable expansion in food production, if rinderpest, a cattle disease which makes cattle raising unprofitable there, could be eradicated, the speaker said. Large areas of China are typical grazing land, and while the country imported large quantities of rice, it exported a great many food specialities, particularly eggs.

"Unless one has traveled in the Malay archipelego, one's ideas as to the size of the region are apt to be rather hazy," Dr. Merrill said. "If a map of the archipelego be drawn to the same scale and placed over a map of the United States, the northern end of Sumatra would appear on the coast of northern California, Oregon or Washington, while a large part of the great island of New Guinea would extend into the Atlantic ocean.

"To these vast undeveloped areas may be added large regions in the Malay peninsula and the Philippines. It would seem desirable to develop some of these regions as basic food-producing areas, and this development may be forced, in the not distant future, by changing economic conditions. To develop these countries, however, labor must be available in the form of largely increased population; yet there is always the personal element to be considered in that Malay peoples are in no sense colonizers."

THE DENSITY OF THE GASES IN THE STARS

Science Service

PRESSURE in the interior of the stars is so immense that it breaks the molecules of matter apart, with the result that gases may be compressed to the density of metals and yet behave as gases, writes Professor A. S. Eddington, English astronomer, in a recent publication. The compressibility of gas under earthly conditions, says Professor Eddington, depends upon the size of the gas molecules, which in turn depends upon the number of electrons it contains and upon their orbits about the central nucleus. Gas molecules behave somewhat as rigid spheres, and a limit to possible compression is reached when the spheres become tightly packed.

But at the high temperature within the stars these spheres are all broken up and a rearrangement of their parts or electrons becomes a possibility, much as a complicated machine if taken down may be packed into a smaller space. So Professor Eddington sees no difficulty in assuming that true gases as heavy as platinum, or 20 times as heavy as water, may exist in the interiors of some of the stars.

Similarly, he finds it possible that solid matter may be so compressed as to have a density of 50,000 times of water or inconceivably greater than anything of which we have any direct knowledge. Such a condition is indicated in the make-up of the star which is a faint companion to Sirius, the brightest star in the sky. This little star apparently has a diameter only about three times that of the earth, while its mass approaches that of the sun. As a result, its density should be about 50,000 times that of water.

A NEW SOUNDING METHOD USED BY THE U. S. COAST AND GEODETIC SURVEY

Science Service

ACCURATE determinations of the velocity of sound in sea water, which will make possible the further development of the sonic depth finder in marine survey work, have been made by the U. S. Coast and Geodetic Survey. The speed of the sound waves under water has been found to vary so greatly with the temperature, pressure and salinity that unless these are known the sonic method of sounding the depths of the sea is apt to be inaccurate. The problem has been to work out some sort of theoretical velocity which might be safely used in this work.

The oceanographic cruise last fall of the Coast and Geodetic Survey steamer, *Guide*, from the east to the west coast by way of Porto Rico and the Panama Canal and the subsequent work of that vessel on the Pacific coast led to results which went far toward a solution of this problem. Wire soundings were taken at many places ranging in depth up to more than five miles. Sonic soundings were taken at the same time, and the temperature of the water and its salinity measured or calculated for various depths.

As a result, it has been found possible to deduce a theoretical velocity for the sound waves at many places and under differing conditions which when used for computing depths by the sonic method and compared with those obtained by wire soundings showed very slight errors.

The sonic depth finder was developed by Dr. H. C. Hayes, of the Naval Research Laboratory, Bellevue, D. C. It measures the time taken for sound to travel to the

bottom of the ocean and back again and has been used for deep sea soundings by navy vessels in various parts of the ocean, especially off the southern California coast. Sound travels in sea water at a speed of from 4,800 to 5,000 feet a second, and the importance of determining this velocity accurately, if accurate soundings are to be made, is evident.

STATEMENT ON WIRE TRANSMISSION OF PHOTOGRAPHS BY R. W. KING

I NOTICE in SCIENCE, for May 30, an article entitled "Wire Transmission of Photographs," which was circulated by Science Service. I beg a little additional space to correct certain misconceptions which the article in question contains.

The purpose of the recent demonstration in which photographs were successfully transmitted over a telephone line from Cleveland to New York, was to show the newspapers the capabilities of the new system. This system provides a simple, rapid and accurate method of transmitting pictures which will operate over a telephone line. The apparatus was developed in the laboratories of the American Telephone and Telegraph Company and the Western Electric Company and represents the association of many recent inventions together with standard types of telephone and telegraph apparatus which have been readapted to this new use. The development work has been carried out by a number of engineers and in due course technical articles describing the apparatus will appear under their names.

Regarding the future use of the system, officials of the two companies announced, at the time of the demonstration, that the extent to which it is installed on our various long distance telephone lines will depend entirely upon the demand which arises for such a service. As has been demonstrated in previous tests, the system is also applicable to radio transmission of pictures when atmospheric conditions are such that steadiness of transmission and freedom from interference can be assured.

The simplicity of the method is such that a positive transparency film is at once ready for transmission. The apparatus is so designed as to transmit a picture five inches by seven inches in a little less than five minutes. The picture is received in such form that after photographic development of the usual sort, it is ready for newspaper or other reproduction. Line drawings, handwriting and printing, when not too small, can also be transmitted. As films can be used for transmission while still wet, this system eliminates the delay which would otherwise be caused by drying.

The film upon which a picture has been transferred is inserted in the transmitter simply by rolling it up in a cylindrical form. During operation a very small and intense beam of light shines through the film onto a photoelectric cell within. The film is rotated at a uniform speed and by means of a screw mechanism is caused to advance parallel to the axis of the cylinder. The motion of the light relative to the cylinder is therefore the same as that of a phonograph needle relative to a cylindrical record. In this way, each minute portion of the picture in turn affects the intensity of the light reaching the photoelectric cell. This variation in the amount of light striking the sensitive surface of the cell gives rise to a current which, through the agency of a vacuum tube amplifier and modulator, controls the current flowing through the telephone line.

At the receiving end an unexposed photographic film is rotated under a beam of light in a manner similar to that at the transmitting end. The two films are caused to rotate at exactly the same speed and the impulses starting from the photoelectric cell at the sending end control, by means of a new device known as a light valve, the amount of light reaching the film at the receiving end.

ITEMS

Science Service

AN attempt to raise silver foxes in mountain altitudes is now being made in France. Hitherto it was assumed that skins of the finest texture, worth more than their weight in gold, could only be grown in northern latitudes where the winters are not only very cold but very long. The French National Society of Acclimation has established a silver fox farm in the French Alps on the theory that the temperatures there would be just as suitable as those of northern Canada. An announcement made by them states that preliminary results are satisfactory.

THE smallest fish in the world live in Lake Buhi in southern Luzon, the largest of the Philippine Islands. These ichthyological midgets are only about half an inch long when full grown and sexually mature, and are so very slender that they are much smaller than any other fish. They belong to the family of gobies, distinguished by a sort of sucking disk used for attaching the fish firmly to stones. The only big thing about this fish is its name, Mistichthys Luzonensis, H. M. Smith. These minute gobies occur in such vast numbers in Lake Buhi that they are the object of an important local industry. They are caught in enormous numbers by means of cloth nets and are not only used in the towns along the shores of the lake but are also shipped for considerable distances. Tabios, or sinaparan, as they are called in the Bikol language, are eaten fried when freshly caught and are pressed into cakes and dried when the market is overstocked. A hungry workman literally eats thousands of fish at a meal.

THE first three months of 1924 seem to have been the healthiest first quarter of a year ever recorded, according to a report of the death-rate of the 15,000,000 industrial policyholders of the Metropolitan Life Insurance Company. The death rate was 9.2 per 1,000 per year, as compared with 9.7 in 1921, which formerly showed the healthiest first quarter. Improvement is shown for almost every cause of death, except automobile accidents, which show the usual increase. For the first time since 1920 there was a drop in the mortality from alcoholism. The number of suicides declined as did the number of deaths from diabetes, the last being attributed to the increasing use of insulin as a remedy.