SCIENCE NEWS

Science Service, Washington, D. C.

THE HEALTH OUTLOOK FOR 1929

THE year 1929 is destined to produce a good health record. Such is the expectation of health officials.

The health record for 1928, measured by the death rate, will be as good as that of the preceding year, perhaps better. The death rate for tuberculosis has continued its downward trend, as has the diphtheria death rate. Fewer cases of typhoid fever were reported in 1928 than in the two preceding years. Infantile paralysis showed an increase above the normal, but did not achieve as high a record in 1928 as in 1927.

No definite forecast of the health situation for 1929 can be given on account of possible epidemics which have a way of springing up without warning and completely upsetting official and unofficial calculations. Yet certain predictions may be safely made, according to public health officials.

During the early months of the new year the respiratory diseases, colds, coughs, grippe and pneumonia, will be very prevalent. February and March are known as the months for these diseases and March heads the list. With the respiratory diseases, measles will show an increase during the first three or four months. Scarlet fever will have a similar increase, but it will not be so marked during the early part of the year. A larger increase of scarlet fever is to be expected during the fall.

Infantile paralysis, the scourge of childhood, almost invariably shows an increase during the summer, beginning the latter part of July and continuing through August. Except in epidemic years this disease begins to wane during October and November.

Smallpox is one of the diseases for which an effective preventive is known. This method has been known for more than a century and a quarter. Universal vaccination would eliminate entirely the specter of smallpox. Without universal vaccination, the disease may be expected to increase during the early part of the year. The low ebb of this disease will be from June to October.

The striking reduction of typhoid fever in the United States during the past 25 years is one of the most convincing evidences of the reduction of death rates and case rates which may be expected when the principles of modern sanitary science are given practical application in the control of disease. A little more than 50 years ago the typhoid death rate was about 45 per 100,000. In 1910 it was reduced one half and at present it is a little over 2 per 100,000. Each year shows a still further reduction in typhoid fever. If this triumph of modern sanitation over disease continues during the coming year it will show a still further reduction in typhoid fever. It is usually spoken of as a fall disease, the increase in number of cases beginning in June and reaching the peak in September. For the past three years the number of cases has been progressively less. Perhaps 1929 will set an even lower record for typhoid fever.

Disease knows no boundaries, either state or national. For that reason a country like the United States with a vast coast line, where ships from foreign ports are arriving constantly, must be constantly on the alert to prevent the introduction of epidemics. The year 1928 saw the reappearance in Africa and South America of the dread disease yellow fever. This necessitated a general tightening up of maritime quarantine inspection. Whether or not 1929 will see further advances of yellow fever is problematical. Bubonic plague is prevalent in many countries of the world and is one of the major quarantinable diseases which must be always guarded against. In certain countries of the East, cholera reappeared during the past summer. Whether conditions during 1929 will favor such a recurrence depends on factors yet to be determined.

With the industrial growth of the United States and the introduction of new processes and the manufacture of new articles come new industrial health hazards. Industry is always on the alert to discover and prevent these new hazards. It may be that 1929 will bring additional problems in this field for which a solution must be found.

In all probability cancer, chronic heart disease and chronic Bright's disease will continue to be among the leading causes of death in the United States during 1929 although they will not be the principal causes of illness. Diseases of the respiratory organs, including lungs, bronchi, throat, nose and larynx, are the most important causes of illness.

Many scientists are working vigorously on the problem of the prevention and cure of cancer. Who knows but that during 1929 some important forward step will be made in this field? Cancer is considered an increasingly important public health problem.

With a vast army of scientific men vigorously pushing forward on many and varied problems related to disease and health, perhaps during 1929 important contributions may be made to the science of preventive medicine.

A THIRTEEN-MONTH CALENDAR

THE proposed new thirteen-month calendar was to be discussed by the House Foreign Relations Committee before the close of the year 1928.

Hearings on the Joint Resolutions "requesting the President to propose calling an international conference for calendar simplification, or to accept, on behalf of the United States, an invitation to participate in such a conference," were scheduled for December 21.

"In view of the action of United States delegates at the Havana international conference," says Representative Stephen Porter, Republican, of Pennsylvania, Chairman of the House Foreign Relations Committee, "we are obligated in this country to at least take part in an international conference for calendar simplification."

Porter himself favors the new calendar.

"Thirteen months of exactly twenty-eight days each will enable all businesses, gatherers of statistics, and accountants to know more exactly where they stand. It is impossible at present for the receipts and expenditures of one month to be accurately compared with another.

"Pay days would come more regularly. Easter would always fall on the same day and date. Holidays would always occur on the same week day—Monday.

"It seems to me very logical that the world should adopt this new calendar, and I believe that it will do so."

The joint resolution which was introduced in the Senate by Senator Thomas D. Schall, Republican, of Minnesota, summarizes the three fundamental defects of the present calendar as follows:

"The divisions of the year, the months, quarters, and half years are of unequal length. The months contain from twenty-eight to thirty-one days. As a result, the number of days in the quarters are, respectively, ninety (ninety-one in a leap year), ninety-one, ninety-two and ninety-two. The first half-year, therefore, contains two or three days less than the second.

"The calendar is not fixed; it changes each year; the year, in fact, consists of fifty-two weeks plus one or two days. In consequence:

"(a) The dates of periodical events can never be fixed with precision.

"(b) The position of the weeks in the quarters varies each year; that is to say, the weeks overlap the divisions of the year in a different way each time, and complications accordingly arise in the reckoning of accounts, statistics, and so forth.

"(c) The fifteenth and thirtieth of the month are very important dates as regards the falling due and the payment of wages and rents. When these dates are Sundays, the payments must be postponed or advanced.

"(d) Finally—and this is, perhaps, the greatest drawback from a statistical and commercial view-point—since the various days of the week are not of the same value as regards the volume of trade, and the years and the months do not from year to year include the same number of individual week days, there can be no genuine statistical comparison between one year and another, while the various subdivisions of the year itself—half years, quarters and months—are likewise incapable of comparison."

The third disadvantage listed is the non-fixity of Easter, with its consequent displacement of the movable festivals, and resulting disadvantages from civil and religious points of view.

Representative John Q. Tillson, Republican, of Connecticut, majority leader in the House, also favors the new calendar.

"Once it is put into operation," he says, "we shall wonder how we put up with the old inefficient calendar so long."

Representative Walter Newton, Republican, of Minnesota, is inclined to favor the new calendar, but believes that after it is adopted, there will be confusion for a few years, because of references to previous years, and because of the insistence of some who may want to continue the old calendar.

There seems little chance that the joint resolution can pass both houses of congress this session, but if hearings thereon are concluded by the House, its passage during the special or regular session of the seventy-first congress looks hopeful. It will, of course, have to be reintroduced in the next congress, if it does not pass before March fourth.

Senator Borah, chairman of the Senate Foreign Relations Committee, is not inclined to favor the new calendar at present, although he admits he has not given the matter the study which he should like to give before finally making up his mind.

"Offhand," he declares, "it appears to me as a step towards that overstandardization which I believe is becoming one of our virtues so emphasized nowadays that it tends to become a fault."

TEMPERATURE OF THE MOON

BATHING in molten sulphur at noon and skating on frozen alcohol at night would be possible for inhabitants of the moon if there were any and if they were physically able to stand the temperature extremes.

At the meeting of the American Astronomical Society, Dr. Seth B. Nicholson, of the Mt. Wilson Observatory, told of his researches in collaboration with Dr. Edison Pettit on the temperature of the moon.

The researches were made with the use of a thermocouple that converted the faint heat rays from the moon into electricity. A very thin glass was used to separate the light reflected from the planet from the heat. With observations without the thin screen, the total of both heat and light was measured, and with the screen the heat was eliminated, so that the difference was due to the heat.

When the sun is directly over a point on the moon's surface—that is, when it is noon, the temperature reaches about 265 degrees Fahrenheit, higher than the boiling point of water, and high enough to melt both sulphur and iodine. For about a thousand miles on all sides of such a point, where the sun is directly overhead, or about an eighth of the entire area of the moon, the temperature is always above the boiling point of water.

An indication of what the dark, unilluminated side of the moon may be like was obtained when the astronomers made measurements during a recent lunar eclipse. A series of temperature measurements of a single point was made. Before the eclipse began, the temperature was 156 degrees Fahrenheit. At the end of the total phase it had dropped to 196 degrees below zero, Fahrenheit, the freezing point of alcohol. Half an hour after the eclipse was over, the temperature had returned to 135 degrees, nearly as hot as at the beginning.

The moon is thus shown to be of very low temperature conductivity. Of all the heat that falls on it, only about 6 per cent. is absorbed into the material, the rest being immediately reradiated away. During the short space of an eclipse, about a third of this is conducted to the surface, and then radiated into space.

CERTIFIED STAINS AND THE DIAGNOSIS OF DISEASE

THE diagnosis of a number of diseases depends largely on biological stains or dyes. When the doctor takes a swab from your throat for a culture to determine whether or not you have diphtheria, he must use a stain called methylene blue in order to see under the microscope the germs that grew in the culture from your throat. Naturally, the stain must be dependable, or the diagnosis may be inaccurate. For this reason a Stain Commission has been established to certify biological stains.

Thirty-eight stains have been put on this certification basis, Dr. H. J. Conn, of the New York Agricultural Experiment Station, reported to the Society of American Bacteriologists meeting in Richmond, Virginia. In 1923 almost half the samples submitted to the commission were refused certification. In 1928 only 3 per cent. of those submitted were refused, said Mr. Conn, commenting on the improvement in the stain supply. Attempts are being made to secure the cooperation of the Federal Specifications Board in drawing up specifications for stains in harmony with those of the Stain Commission.

A temperature difference of nine degrees Centigrade is significant in determining whether bacteria contaminating water are from intestinal discharges of man and other warm-blooded animals or from cold-blooded animals, such as fish, is the conclusion reached from experiments of the late Laban W. Leiter. An account of the study was reported by William W. Ford, of the Johns Hopkins University School of Hygiene and Public Health. Certain strains of a type of bacteria known as *Bacillus coli* from men and warm-blooded animals ferment dextrose broth when grown at 46° C. Certain other strains of bacteria appear to be like *B. coli* in every respect, but they will ferment dextrose broth only when grown at 37 degrees Centigrade. These strains are from cold-blooded animals and are probably of no significance when found in water. The discovery of this difference will probably have an important bearing on the question of detecting sewage pollution in water.

THE PRODUCTION OF INSULIN

A NEW and simpler way of making insulin, the great boon to diabetics, may result from studies now being made. Professor John J. Abel, who was the first to make pure crystalline insulin, reported to members of the American Association for the Advancement of Science that probably only a part of the complex insulin molecule is responsible for the action of the substance. In that case it will probably not be necessary to build up the whole complex structure in order to get an active compound.

Professor Abel and Dr. H. Jensen, of the Johns Hopkins School of Medicine, are now studying the chemical composition and structure of insulin, which is a substance secreted by the pancreas which acts to regulate the body's utilization of sugar. Lack of insulin results in the disease known as diabetes. Drs. Banting, Macleod, Collip and Best, of the University of Toronto, were able to prepare a pancreatic extract which contained insulin and was effective in treating diabetes. Insulin is of protein nature.

"The outstanding characteristic of crystalline insulin in comparison with other proteins is its high sulphur content (3.1 to 3.2 per cent.) and its instability toward alkali," said Professor Abel. Crystalline insulin has a very powerful action. The average daily dosage of insulin given to a patient suffering from diabetes would correspond to 1 mg, or about one hundredth of a grain of crystalline insulin.

ITEMS

MUCH confusion arises during an influenza epidemic because of the tendency to call every cold the "flu." Certain definite symptoms distinguish influenza from colds and other respiratory diseases. "Low blood count, headache, conjunctivitis, generalized aches and pains, fever and prostration are the symptoms of influenza," stated Dr. Peter K. Olitsky, of the Rockefeller Institute for Medical Research, in response to a *Science Service* inquiry. "The blood count is one of the most important signs of influenza. Influenza should be differentiated from the ordinary common head cold or other respiratory troubles. Researches have been conducted on the causation of influenza since 1889 when the pandemic preceding that of 1918 occurred. As yet there is no agreement as to the causal agent. There is also no uniformity of opinion as to whether one attack can induce immunity against subsequent infection."

BACTERIOPHAGE, deadly enemy of disease germs, is being substituted for typhoid vaccine as a means of protecting persons from typhoid fever, Dr. N. W. Larkum, of the Michigan Department of Health, reported to the meeting in Richmond, Virginia, of the Society of American Bacteriologists. The study has been carried on among inmates of state institutions. The power of the blood to kill disease germs is greater when the subjects are given bacteriophage than when they are given typhoid vaccine, Dr. Larkum reported. A single inoculation of bacteriophage had more lasting effect on the blood than a single inoculation of the vaccine. This has a bearing on the length of time the immunity to typhoid fever will last. Three inoculations of bacteriophage, however, gave less satisfactory results than a single inoculation.

KILAUEA, the world's greatest volcano, is quietly getting material together for another lava flow, according to word just received from Dr. T. A. Jaggar, the volcanologist who lives on the lip of the crater and keeps tab of the titanic chemical operations going on below. During the past month, Dr. Jaggar reports, there have been frequent and heavy avalanches sliding into Halemaumau Pit, the witches' kettle, where most of the lava of Kilauea is now cooked. Recent studies have indicated that most of the lava erupted by volcanoes comes from surface rocks, so that after enough of these avalanche-batches have been dumped into this hopper presumably a new lava flow will come out. During one week in October the seismographs at Volcano House registered 16 small local earthquakes.