SCIENCE NEWS

PERIODICITY OF INFLUENZA

Science Service

FURTHER evidence of periodicity in outbreaks of influenza is afforded by a recent increase in the number of cases of the disease in London and other English cities, according to Dr. George W. McCoy, director of the U. S. Hygienic Laboratory. But the recurrence of the disease in England does not necessarily mean an epidemic.

The reports from overseas stated that the first increase in the number of cases of influenza in English cities was noted during the third week in September. This was nearly 33 weeks from the date of the last outbreak there, a period which is coming to be associated with revivals of the disease. This period was first observed by Dr. Brownlee, statistician of the British Medical Research Council, and it has been recently confirmed by the health authorities of Liverpool.

Commenting on these reports, Dr. McCoy said: "There is much evidence for a recurrent periodicity in influenza epidemics for a period of some years following a general world epidemic such as was experienced in 1918–19. This period seems to be close to eight months or 33 weeks from the beginning of one epidemic to that of another, although irregularities sometimes occur. This is particularly true if a recurrence is due during the warm months. In such a case only a few cases are usually noted and no real epidemic develops. For example, the 33 weeks period since the outbreak of the last epidemic here ended late in August, but there has been no outbreak. The next date for recurrence if the period holds good is late next spring, but the lateness of the season will probably prevent much of an outbreak."

Dr. McCoy called attention to a periodicity in epidemics of other infectious diseases such as measles and scarlet fever.

"It has been found in New York," he said, "that measles is much more prevalent on alternate years, while for scarlet fever the period seems to be four or five years. Why this is so we do not know."

Some medical authorities in England have hazarded a guess that influenza recurs periodically and spontaneously in some individuals who have suffered from the disease and have cited the outbreak of the disease on ships which have been long at set as favoring such a theory, but it has as yet not found general acceptance.

LABORATORY WORKERS AND INFECTIOUS DISEASE

Science Service

TWO cases of Malta fever, a highly infectious but seldom fatal disease and one very rare in this country, have occurred among the laboratory staff of the U. S. Public Health Service Hygienic Laboratory, where the disease is under investigation. Both patients are now convalescent.

Goats are subject to the disease, and a few months ago there was an outbreak of it in Arizona in sections where unpasteurized goat's milk was extensively used as food. Doctors and workers from the Hygienic Laboratory were sent to the spot and after quelling the outbreak returned to Washington where further inquiry as to methods for the prevention and cure of the malady were undertaken. The two cases among the laboratory workers followed.

Malta fever, as its name indicates, was formerly very prevalent on the island of that name and to a less extent throughout the whole Mediterranean basin where goats' milk is a staple food. While rarely fatal, it causes disability for long periods in many cases, convalescence being interrupted and tedious.

The two cases of this disease among workers in the Hygienic Laboratory calls renewed attention to the risks run by the doctors and scientists there who handle deadly germs with the same indifference to danger that is shown by workers with high explosives. Not long ago there were six cases in the laboratory of a rare disease known as tularemia. Rabbits and other small mammals have been found to be infected with this disease which is easily transmitted to human beings, causing a long continued fever and prolonged disability, although the death rate is practically zero. So infectious is this disease that practically every laboratory worker who deals with it catches it sooner or later.

In a more serious class is the deadly Rocky Mountain spotted fever, a disease which because of its prevalence in parts of the northern Rocky Mountain region has caused the abandonment of settlements and ranches and serious loss of life and property. Cattle are subject to it and it is usually transmitted to man through the bite of a certain species of tick. The mortality in man runs from 50 to 90 per cent.

Although it has already killed several workers in the U. S. Public Health Service, the Hygienic Laboratory is on its trail, seeking a method of immunization or cure. The work is in charge of Dr. R. R. Spencer, who is regarded by his fellow workers, themselves used to dealing with such unpleasant diseases as plague, smallpox and typhus, as literally on the firing line of science, for the unseen bacteria are more deadly than enemy bullets and give no warning until their victim is stricken down.

FAMINE THREATENS BIRDS OF NORTH

Science Service

FAMINE threatens the animals and birds of the northern forests, if the signs observed by scientific naturalists are to be credited. Creatures furred and feathered, which ordinarily winter in the sub-Arctic wilderness, are working their way southward, seeking food. The long-continued drought is held responsible for extraordinarily small crops of evergreen cones, which are a chief dependence of the winter birds and the squirrels. Moreover, a scarcity of mice and rabbits is suspected.

As a consequence of these conditions the small birds are moving, and the owls are following them. The fierce goshawk, the great gray Arctic owl and the horned owl, when deprived of a supply of mammals, also turn to the little birds for food, and they, too, promise to descend into regions which ordinarily they never enter. A similar famine several winters ago brought great flocks of small birds, crossbills, nuthatches, pine grosbeaks, tree sparrows, creepers, woodpeckers, purple finches, chickadees, snowbirds, juncoes and other hardy species, which ordinarily find living easy in the icy wilderness northward. They were much in evidence in the country neighborhoods and in the suburbs and parks of New England cities. They were accompanied by the owls and the goshawk, which levied toll on the henyards and game as well as upon the birds.

Edward Howe Forbush, director of the division of ornithology of the Massachusetts Department of Agriculture, in a statement just issued points out as "a most significant event among the birds" the movement of red-breasted nuthatches, which began in Maine and the Canadian provinces in August and has spread over southern New England and probably farther south. This movement, he says, indicates a scarcity of cones in the north, no doubt the result of a dry season. If this scarcity is a fact, a southward movement of pine grosbeaks, crossbills and other boreal birds may be expected. Mr. Forbush continues:

"Large flights of birds are coming down through northern New England where wild fruits and cones are scarce. They are stripping the wild cherry trees of their fruit. Red squirrels have appeared in numbers in northern Vermont, and are stripping the pine trees of their cones. They are said to have come in from Canada and to be moving southward in search of food. All this as well as an early flight of owls indicates famine in the north. There must be a scarcity of rabbits and of mice in the north. A marked migration of owls has taken place in the woods of northern Ontario. Small owls were seen in the day time and many great horned owls were hooting at night. Since then horned owls have been reported in southern New England."

INVISIBLE METAL WIRE

Science Service

SCIENTISTS at the Bell System Laboratories of the Western Electric Company have found it possible to make gossamer-like metallic strands as fine as 200-millionths of an inch in diameter.

These copper-nickel wires are being used in the construction of the vacuum thermocouple. Practically invisible to the eye as they are, it is found necessary to weld them together under the microscope for enclosure within the minute vacuum bulbs.

The American thermocouple was one of the many "war babies." Prior to the war thermocouples came from Germany. When that crisis involved cutting off the supply from abroad, the Western Electric Company began experimental work.

Thermocouples are required to adjust circuits in the vacuum tube repeaters on long-distance telephone lines. In general these tiny glass bulbs are used to measure the small alternating currents in telephony and radio. The wires made up from a copper-nickel alloy used in fuses to protect the thermocouples are passed through an electrolytic acid bath where they are eaten down to the size desired, it being impracticable to draw wire through dies as fine as is necessary.

Both copper-nickel and tungsten wires are used in this laboratory. The tungsten threads are the smallest of all, being only 200-millionths of an inch thick—a good one hundred of them would be required to make one wire the size of the hair on your head.

Before the development of the electrolytic process, it was exceedingly difficult and expensive to draw the tungsten wire to sizes less than 500 hundred thousandths of an inch in the laboratory. Smaller! smaller! has been the cry until this wire which the eye can hardly discover even under strong light with the aid of a microscope has been evolved and can be produced easily.

MUSIC AND EMOTIONAL EXPRESSION

Science Service

CANNED music is not new; but canned thrills, extracted from canned music and preserved as an aid in the study of human emotion may follow from recent work done by Dr. C. E. Seashore, head of the department of psychology at the Iowa State University. He has been making a study of the expression of emotion in music and concludes that since everything in the way of musical expression that is conveyed to the listener comes in terms of the sound wave, and since these sound waves may be recorded, measured and analyzed by instruments of precision it is possible to get a perfectly accurate record of what the musician conveys.

These factors may then be reproduced separately and their emotional effect combined, making "an approach which is extraordinarily promising for the scientific study of the expression of musical emotion."

It has been found, for example, that the appealing vibrant quality in a singing voice, known to musicians as "the vibrato," is a combined pulsation of pitch and intensity averaging about six oscillations a second. It can, therefore, be expressed in terms of three variable quantities, pitch or frequency of the sound wave, intensity or loudness, and time. Within these three factors all possible variations of emotional expression possible to the vibrato may be found.

A similar method of study may be applied to the emotional effect of timbre which gives the characteristic quality to sounds of all character, and to tempo and rhythm.

The possibility is indicated of the detection of counterfeit emotion through a study, preferably from photographic records, of the voice or musical tone, and here a note of warning is sounded to flirts and flappers. For, says Professor Seashore:

"A tender emotion is a condition of nervous instability. With the objective facts in hand we can correlate the vibrato with principles of neural discharge, showing

the relation of artistic expression in music to nervous instability. We may investigate the relation of a feigned emotion or a genuine emotion, according as the music was or was not expressed emotionally.''

The study so far has been made chiefly through phonograph records which incidentally offer a valuable method in this connection for the study of emotional elements of primitive music.

SNOWFALLS

Science Service

''WHERE are the snows of yesteryear?'' is a question that has long agitated not only the poets but the oldest inhabitants who are fond of telling of what happened in the good old days. The question is answered in part by Clarence J. Root, meteorologist of the local office of the U. S. Weather Bureau, who states that records show in nearly all sections of the country just as heavy recent snowfalls as those which occurred a generation or more ago.

He also declares that just because snowfall in some sections may have been light during the past few years it doesn't follow that there is not going to be much this winter. There may be as much or more.

The only place whose record gives comfort to the oldest inhabitant, Mr. Root says, is Boston, where the snowiest winter in Weather Bureau records was that of 1873–74. Portland, Maine, made its record in 1886–87 but came within half an inch of equalling it last winter when roads were impassable for motor traffic from New Year to the end of March. Throughout the northeast generally there have been but six winters in which more snow fell than during that of 1922–23.

In the middle west the winters of heaviest snowfall were 1909–10 in Columbus, Ohio; 1913–14 in Springfield, Ill.; 1885–86 in Cheyenne; and 1916–17 in Salt Lake City. January, 1918, was the most severe month ever known in Illinois since records were kept and the storm of the eleventh of that month was the worst in the history of the state.

So Mr. Root concludes that there will be undoubtedly in the future storms and snowy winters like those in the past, snows which will enable the oldest inhabitant fifty years hence to say: ''We didn't have mild winters like this when I was a boy.''

THE "LOST TRIBES" OF CHINA

THE National Geographic Society announces the sending of an expedition into remotest China to search for human traces of east Asia's history before the Chinese came, to hunt for specimens of a monkey believed to be the largest non-anthropoid species in the world, and to collect botanical specimens in a spacious region virgin to scientific study.

Kweichow, where the mysterious non-Chinese tribes of China dwell, is the objective of the expedition. This province, about the size of Missouri, with a population estimated at 8,000,000, is as inaccessible as Tibet. It is the least fertile, least visited, and most backward portion of China.

Yet the strange tribes which suggest that some ethnic circus troupe was stranded there make Kweichow a possible vista of hitherto unrecorded human history. One of the few visitors among these tribes, who makes no claim to being a student of anthropology, said he saw types resembling the Gurkha, the South Sea Islander, the American Indian, the East Indian and the Negro.

It may develop that some or all of these strange tribes constitute the American Indians of China. Another writer says that the process of Chinese absorption has been going on among them since 2356 B. C.!

Between two and three million of the non-Chinese populace survive. Many of their strongholds never have been visited by white men; whole tribes did not know the world war was in progress. While China was stirred by the Shantung problem because the Chinese feared encroachments in the province of Confucius' tomb, these tribes were oblivious of any ''Shantung problem,'' though they may retain the vestiges of a culture, spread over the whole of southern China in the days when Confucius taught.

Occasional travelers who have penetrated villages of some of these tribes tell how one of them thrashes grain on the roof tops as in the Holy Land; how others have great ''prayer flags'' flying on fortified castles; and how quarrels are settled on horseback with blunderbusses, broadswords and bags of stones as the weapons in these curious jousts.

Kweichow has escaped zoological collectors, although it holds hope of many animal prizes. It lies on the watershed between the Yangtze and the West River. Its northern mountains are a continuation of the Tibetan system. Therefore the faunas of Indo-China, of the mountains, and of the Yangtze valley should meet within its borders.

The monkey the expedition particularly hopes to find is the *Rhinopithecus Brelichi,* of which the only evidence now available is the skin of a female which shows a head and body measurement of 29 inches and a tail measurement of 39 inches. There has been speculation regarding the possibility of this species being an animal described in a famous passage of Chinese literature as follows: ''Its nose is turned upward, and the tail very long and forked at the end; whenever it rains, the animal thrusts the forks into its nose. It goes in herds and lives in friendship; when one dies the rest accompany it to burial. Its activity is so great that it runs its head against the trees; its fur is soft and gray and the face black.''

Going directly to Peking, Frederick R. Wulsin, leader of the National Geographic Society expedition, will first take with him into Kweichow a Chinese botanist and a staff of Chinese assistants for a reconnaissance. Later he will be accompanied by a party comprising botanists, zoologists and anthropologists. The last named will study the origin, physique, habits, language and rich mythology of the non-Chinese tribes which vary in all these respects from their Chinese neighbors.

SUNSHINE AND CLOUDS

News Bulletin, The National Geographic Society

THE recent payment of an insurance claim for $1,500

because clouds kept a group of scientists from taking pictures of an eclipse of the sun brings up questions of sunshine and cloudiness in various parts of the United States, which may run into dollars and cents at other times than during occasional eclipses.

Just as there is a "population center," a "wealth center" and a "geographical center" of the United States, so there is a "sunshine center" and a "cloud center."

Most of the familiar "centers" lie east of the Mississippi River, but the country's "sunshine center" breaks this precedent and is situated in the extreme Southwest, near the mouth of the Colorado River. Yuma, Arizona, furnishes the dot on the map on which to place a compass and draw the circle into which the sunbeams pour almost ceaselessly during daylight hours. Only 18 days in the average year can be called cloudy in Yuma and in a roughly circular area about 100 miles from the city in every direction.

Considering the length of the days as well as their number, the region around Yuma and embracing the southwestern third of Arizona gets 85 per cent. of all the sunbeams aimed at it during the year, while 80 per cent. of all the sunshine that could be received hits the mark in the southeastern end of California, practically the whole of Arizona, southwestern New Mexico and the little sharp westernmost point of Texas around El Paso.

Sunshine runs into dollars and cents in this region because the line of "80 per cent. sunshine," or perhaps the slightly larger 75 per cent. line, may be said to enclose the section of the United States which sells its climate on a year-round basis to thousands of tourists, out-door enthusiasts and health-seekers.

Nature has given compensations for a lack of sunshine. As the percentage of fair days grows less and less outward from the "sunshine center," the rainfall grows greater and greater, so that agriculture may flourish without irrigation. But after the mouth of the Mississippi has been passed, the sunshine lines double northward, putting southern Florida practically into the 75 per cent. sunshine area. Here again sunshine means dollars and cents for Miami and Palm Beach and their fellow resorts.

The "cloud center" of the United States is in a little region in western Washington near the southernmost indentation of Puget Sound. Half the days there are cloudy and an additional 30 per cent. are partly cloudy. About the little center is a large area of only slightly less marked cloudiness.

In the region around the country's "cloud center" there is another sort of dollars and cents compensation. The cloudiness in this case is accompanied by heavy rain and snowfall and these, with the high mountains of the region, furnish the ingredients which give the State of Washington a greater potential water power than that of any other state in the Union.

There are two secondary "cloud centers" in the east. On the southeastern shore of Lake Ontario and in the Upper Peninsula of Michigan, between Lakes Superior and Michigan, three quarters of the days in a year are either cloudy or partly cloudy.

ITEMS

Science Service

DIPHTHERIA among school children could be largely eliminated through preventive immunization of children of pre-school age who have been shown by the Schick test to be susceptible to that disease, said Dr. Frederick W. Sears, N. Y. State health officer for Syracuse and near-by counties, in an address before the American Public Health Association at Boston. This might be brought about through proper cooperation between parents and physicians, the bringing before them by the proper authorities of the great value and benefit of the Schick test and the immunization of children shown to be susceptible to diphtheria infection. Testing the children and subsequent immunization was a task better performed by private physicians than by the state.

RHEUMATISM is the principal cause of chronic heart disease, Dr. C. V. Craster, of Newark, N. J., told members of the American Public Health Association in convention at Boston recently. He said organic heart disease was a serious menace to America, causing about one seventh of all deaths. It is on the increase and has already superseded tuberculosis as the principal cause of death. Dr. Craster advocated more adequate hospital treatment for rheumatic patients, and popular education as to the danger of heart disease following rheumatism, tonsilitis and chorea during childhood. The highest death rates from organic heart disease are to be found in the States of Vermont, New Hampshire and Massachusetts, while the lowest reported rates are from Montana, Mississippi and Tennessee.

ICE has been reported in the Atlantic near the Azores at a point 600 miles further east than any that has been seen this year. The report was made to the Hydrographic Office by the Dutch steamer Djambi, officers of which relate seeing a piece of ice 30 feet long and standing about a foot and a half out of water in latitude 40 degrees 10 minutes and longitude 31 degrees 36 minutes. This is within 75 miles of Corvo, one of the westernmost of the Azores. The ice was evidently the last remnant of an iceberg that had been carried far to the east by the Gulf Stream before melting.

DR. CHARLES F. MARVIN, chief of the United States Weather Bureau, calls attention to the growing error in the present or Gregorian calendar, adopted by most of the civilized world more than three centuries ago. The error, which amounts at present to 468 thousandths days, is due to the fact that the calendar assumed the length of the year to be 365.2425 days, when it is really 365.24231545 days and growing shorter by about half a second a century. The present calendar omits three leap years in 400 years. Dr. Marvin suggests that it be continued until 3200 A. D., when the error will amount to nearly one day, and that subsequently five leap years in 600 years be omitted. Such a calendar would run until the year 17600 with an error of less than one day.