SCIENCE NEWS

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THE DEATH-RATE IN THE UNITED STATES

THE death-rate for this country for the calendar year 1932 was the lowest ever recorded. This statement was contained in the annual report to Congress of Surgeon-General Hugh S. Cumming. U. S. Public Health Service, which covers the activities of the service for the fiscal year ending July, 1933.

Unusually favorable health conditions prevailed during the first half of 1933 and the indications are that the year just ended will also prove to have been an unusually healthy one. Preliminary reports from large cities of the country for 1933 indicate a still lower death-rate than before recorded, being less than 12 per 100,000 population.

Although the death-rates have remained low, the surgeon-general is conducting special surveys to determine what effect the depression may be having on sickness and mortality in persons formerly in moderate or comfortable financial circumstances but recently much reduced in income.

He reported that preliminary analysis of a study of about 1,000 families in eight large cities indicates higher sickness rates among those of reduced income, especially among those in better circumstances in 1929, but now without employment and on low income, supplemented in some instances by welfare organizations.

Comparing the great reduction in the communicable diseases in the United States since the beginning of the present century, Dr. Cumming pointed out that in 1900 the tuberculosis death-rate in this country was 201.9 per 100,000 population, while in 1932 it was only 61.3; the diphtheria death-rate dropped from 43.3 per 100,000 to 4.8, and typhoid fever from 35.9 to 4.60. The total saving of lives from these three diseases alone, as compared with 1900, was 263,000; while if the 1900 total death-rate in the United States had obtained in 1932 there would have been 800,000 more deaths than actually occurred.

There were only 10,887 cases of smallpox reported in 1932, as compared with 28,755 in 1931 and 46,560 in 1930—a 77 per cent. decrease in 1932 as compared with 1930, and the death-rate for this disease was the lowest ever recorded by the Public Health Service—only 4 per 10,000,000 population. And yet the suffering and death caused by these cases could have been prevented if the means readily available had been applied.

There was actually a decrease in the number of deaths from pellagra in 1932 as compared with the two preceding years, although an increase might have ordinarily been expected as a result of the economic depression. This usual tendency was probably more than offset by health education and preventive measures.

No cases of the dread diseases of plague, cholera or yellow fever occurred in the United States during 1932, although all were present in other countries. About 75,000 cases of cholera were reported throughout the world, plague was wide-spread and yellow fever was reported in Brazil and in several countries in Africa.

An important part of the work of the Public Health Service is the prevention of the introduction of diseases from abroad, in which during the past year, the one hundred and thirty-fifth of its existence, the service was highly successful. Commercial intercourse has long been recognized as an important means of the spread of epidemic diseases, and the increasing use of aerial transportation has added to the danger.

How the service protects the health of travelers in this country may be seen from the fact that 95 per cent. of the sources of drinking water used by railroads and bus lines, 97 per cent. of the sources used by vessels and 97 per cent. of those used by passenger airplanes were inspected and controlled by the U. S. Public Health Service. Formerly these supplies were the cause of many cases of typhoid fever.

SAND DEPOSITS

SANDSTONES were once loose sand, and the fossils that are embedded in them were parts of living animals or plants for which the sand was an environment. For this reason a study of present sand deposits can yield information of value in understanding the processes that went on when sandstones of different types were in the making. At the recent meeting of the Paleontological Society in Chicago, Professor W. H. Twenhofel, of the University of Wisconsin, reviewed the principal types of sand deposits, and their relations to the creatures that live on or in them.

Sand deposits can be grouped under five heads, according to Professor Twenhofel: Wind-blown sand, sandy parts of alluvial fans, river sand, shore sand of lake or sea and lake or sea-bottom sand. Each type of sandy environment offers harborage to a different class of living community, each presents different problems for its inhabitants to solve, and each has a different complex of factors that make either for their preservation as fossils or for their destruction before they can become fossilized.

Thus, wind-blown sand is essentially a desert habitat, even when it occurs in the midst of a relatively humid land. The plants that grow on it are succulents, like the cactus, or leathery-leaved shrubs, like the beach plum. The animal population will be predominantly small in size, with low water requirement: insects, lizards, mice and other small rodents, and the tougher kinds of snails.

Chances of permanent burial resulting finally in fossilization are relatively poor in wind-blown sand. Burial occurs, but it may not last: later winds, or the waters of a cloudburst, may rake the sand away again. Besides, the penetration of air into the sand encourages fairly complete decay. For this reason, sandstone resulting from wind deposits are usually poor in fossils.

Bottom sands of ocean and lake are at the other extreme. The animal and plant life forms found in and on them are naturally largely aquatic or at least amphibian; though strictly terrestrial forms may occasionally drift down, drowned, from shore sources. Move-

ment is much less than in other types of sand deposit, and hence chances of permanent burial and fossilization are much better.

THE PHOTOELECTRIC CELL IN THE TEXTILE INDUSTRY

ADAPTATION of photocells to the textile industry in the cutting of cloth labels at a plant in Grand Rapids, Michigan, is seen by engineers as a step toward continuous production of felts, upholsteries, toweling, blankets and other loom-width materials. Racking of textiles before cutting is eliminated by the process.

Printed cloth labels are fed from a roll to a caesium photocell, with a heavy cross strip of ink as a register mark. The labels are printed by a machine which makes 70 impressions at one stroke. The printed register mark, when it passes in front of the phototube, sets up an electrical disturbance, which is amplified to operate a thyratron tube (grid controlled rectifier). The latter tube affects operation of an electro-magnet solenoid which is on a rocker attachment. This solenoid clamps momentarily on the label tape and draws it backward. Thus, correction of register is on a backward instead of the forward movement of the label tape.

The photocells are affected by penetration of light rays through the cloth, one of the first instances where the "electric eye" has been applied to substances other than transparencies without resorting to picking up light variations by reflections. The light shines through the cloth label, which passes directly over it, cleaning the top of the bulb so that dust or lint does not blur the light intensity. While the label tape is being drawn forward by a peculiar type of steel "finger" grips, the light which affects the photocell is turned off. Thus, no shutters on the photocell aperture were necessary and at the same time no electrical disturbance is set up by the printed matter on the label proper. The light only goes on at the end of the feeder stroke, or approximately the time when the register mark is under the photocell aperture. The solenoid then pulls the label tape backward so that register is perfect. A knife comes down, cutting the labels apart, and another attachment folds the ends over and irons them before packing the labels 500 in a box. The entire process is automatic.

Should register not be perfect, due to a misprint on the label, or if the phototube fails to respond to changes in light intensity, a system of electrical relays throws a clutch and stops operation of the machine until an operator can readjust it. The machine completes 43 labels a minute. Although now only adapted to ribbon widths, it is said the phototube principle can be applied to cutting loom-width textiles also, just as packaging machinery using photocells cuts paper rolls several yards wide. Continuous production would then be assured.

NEGRO-INDIAN MIXTURES IN MEXICO

ZAMBOES, Negro-Indian mixtures on the Black Coast of Guerrero, southern Mexico, have been visited by the joint Mexican-Italian expedition which is making anthropological and sociological studies of peoples in Mexico.

African blood, which dates from Spanish slavery times, tints the whole Guerrero coast a darker shade. After several centuries many villages of comparatively pure Negroes still exist, often side by side with groups of approximately pure Indians.

In an unmixed state the Negroes look down on Indians, calling themselves "people of reason." The Indians, for their part, if asked whether Negro mixtures exist in their villages, answer proudly, "we are Indians." Yet the two have mixed, chiefly through the medium of Spanish blood. Negro blood is at once noticed. Coast people of darker-than-Indian coloring are taller, handsomer, more violent, more spontaneous and less moral.

Indian blood is a remarkable hair straightener. Five degrees of hair are commonly recognized on the Black Coast. There is cuculuxtle—an Aztec Indian word—which refers to tight-kinked African hair. Chino is hair tightly curled in ringlets, resulting from a small dilution of the Indian and his uncurlable hair, with the Negro. More Indian blood produces crespos, or looser waves. Then there is pelo quebrado, "broken hair," which is Indian hair only slightly softened from straightness.

Almost at a glance differences between the races are apparent. The Indian of the interior is almost frozen into a conventionalized pattern. The Indian walks as if he were part of a painted frieze, and his face is not the window of his soul. The Negro is fresh, and stalks with a jazzy air. The Indian loves trees, and lets them grow around his hut to shield him. The Negro cuts down every living thing of green, living boldly in the glaring sun.

In the Indian régime, the man is lord of his woman. Monogamy is the rule, and if any one varies from the path it is the man. Among the Negroes, the woman is the stable pillar of the not very stable family, and the two sexes are almost equal. About her the children bred by different fathers collect. Negro women are fishers, butchers or dressmakers, housework being incidental. Indian women are rarely thus professional.

Although the Negro has not been changed emotionally by living side by side with the Indian, he has nevertheless become quite "Indian" in material culture. Little difference is noted between Negro and Indian huts. Both races sleep on Indian straw mats, eat Indian corn, chile and calabashes, grind grain on Indian stone metates, use Indian style pottery and hollow gourds. Some persons consider the circular hut, typical of the tropical Black Coast, as African in origin, but the question is not settled.

BUFFALO AND THE GLACIER NATIONAL PARK

"A VENTURE in landscape zoology," is the way that George M. Wright, chief of the division of wild life studies of the U. S. Office of National Parks, Buildings and Reservations, describes the project to reintroduce buffalo to the eastern portion of Glacier National Park, Montana, and the adjoining Blackfeet Indian Reservation.

Both park officials and those of the Office of Indian Affairs are greatly interested in the project, and it is hoped that a nucleus herd may be introduced into the Glacier area next spring.

Buffalo once were native to the east side of Glacier Park and to the Blackfeet Reservation, but this area, like all buffalo ranges, became depleted when the great plains animal all but succumbed to extinction following the uncurbed buffalo hunting of frontier days.

It now is planned to introduce a nucleus for a buffalo herd into Glacier Park and the Blackfeet Reservation from the Yellowstone surplus.

Glacier Park still has its wilderness character—its mountains, glaciers and waterfalls, and much of its native wild animals—and the Indians of the adjoining Blackfeet Reservation add color to the scene. But the picture is not complete without the buffalo, which in the past meant so much in the economic life of the Blackfeet.

The plan now under consideration calls for the transfer of a nucleus herd of about fifty buffalo, of varying ages and fairly representative of the normal Yellowstone herd. These animals would be transported by truck to a fenced inclosure of approximately one township in area on the west side of the Blackfeet Reservation where they would be held for possibly a year. After that time they would be turned out of the paddock in summer to range within Glacier National Park, and in winter would range on the Blackfeet Indian Reservation.

Under this scheme responsibility for the management of the herd would rest with the Blackfeet, and as a surplus developed the excess animals would be available for use by the Indians.

DAMAGE FROM EARTHQUAKES

EARTHQUAKES again slew their thousands in the year just past, although at that it was not an extraordinary earthquake year. A strong, destructive shock took about 120 lives and wrecked $41,000,000 worth of property in the Los Angeles-Long Beach region on March 10. That was the only "killer" quake in the United States during the year; but there were others even more destructive in other parts of the world.

The worst, probably, was the one that wreaked terrible damage along the east coast of Japan on March 2. This was apparently a submarine earthquake, centering in the Japan Deep. The official report of the Japanese Government listed 1,560 persons killed, 956 missing, 354 injured, 2,878 houses washed away by the tidal wave that the quake caused, 1,458 houses thrown down and 211 houses burned. The sea wave was recorded as far away as Honolulu and San Francisco.

Three other "killer" quakes were recorded during the year. On April 23 a severe earth shock wracked the Greek island of Kos and the shores of Asia Minor, killing about 100, injuring 500 and rendering 5,000 persons homeless. The west coast of Sumatra was shaken on June 24, with 70 natives reported killed near Benkoelen. The interior of China, near the Tibetan border suffered a strong shock on August 25; a hundred deaths were reported in Szechwan province.

One of the most violent earthquakes of the year occurred in Baffin Bay on November 20. Its tremors, traveling for thousands of miles through the rocks at the surface and deep within the earth, reported its occurrence through hundreds of seismograph instruments all over the earth. This was the only source of news about the Baffin Bay earthquake, for the region is uninhabited, so that there could be no cabled or radioed reports of people killed and the works of their hands laid in ruins. This quake was extraordinary not only for its violence but for its location: no major earthquake had ever before been recorded in the Baffin Bay region.

All these and many other earthquakes were traced to their points of occurrence, or epicenters, by means of a cooperative reporting enterprise participated in by the U. S. Coast and Geodetic Survey, other governmental agencies in foreign countries, the Jesuit Seismological Association and numerous university observatories, with Science Service acting in a liaison capacity. The instruments at a single observatory can tell when and how far away a quake occurred, but can not locate the exact spot. But when their data are wired or cabled to Science Service and compared by the Coast and Geodetic Survey seismologists, arcs from two or more stations can be struck on a map, and their intersections give the location of the epicenter.

ITEMS

AN international institute for psychical research that will investigate claims of spirit phenomena using strictly scientific procedures and the recognized tests of physics and physiology has been organized in London. Foreign as well as British scientists are being invited to participate. Professor G. Elliot Smith, University of London, is president of the new institute and associated with him are: Sir Charles Sherrington, Oxford University; Professor E. D. Adrian, Cambridge; Professor E. W. MacBride, Imperial College of Science; Dr. David F. Fraser-Harris, author of physiological works, and Professor Julian Huxley, King's College. None of these, although recognized in the fields of scientific research, claims any special knowledge of psychical phenomena.

SOUNDS well within the audible range, if they are intense enough, will produce a chemical change in various substances, it has been found by Drs. Earl W. Flosdorf and Leslie A. Chambers, of the University of Pennsylvania School of Medicine. An egg was coagulated as though soft boiled by these audible sounds. Ethyl acetate was broken down to produce acetic acid, vegetable oils were "cracked" with the generation of acetylene gas, and starch was to a slight extent decomposed to produce glucose. The sound vibrations used ranged in frequency from 1,000, about two octaves above the middle C on the piano, to 15,000, which is a very shrill squeak.

KANSAS once had crocodiles. Solid evidence to this effect has been found by Dr. M. G. Mehl, of the University of Missouri, who described his discovery before the Chicago meeting of the Paleontological Society. Dr. Mehl's discovery consists of a fossilized crocodilian skeleton, its skull and some other parts missing. From the parts that remain, the original length is estimated at about twelve feet. The skeleton was uncovered near Salina, Kansas.