

SCIENCE NEWS

Science Service, Washington, D. C.

THE HEALTH OF THE PUBLIC DURING 1940

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IN my review of the mortality for 1939 I indicated that I anticipated no retrogression in the health of the public during 1940. It is gratifying to find that my statement has been essentially confirmed. While official statistics are not available for the total population, the experience of the Metropolitan Life Insurance Company with its millions of industrial policyholders can be used as a safe index of the general situation. For experience has shown that these insured men, women and children, living in all parts of the United States and Canada, form a very fair cross-section of the general public.

The record for the first eleven and a half months of 1940 shows that their mortality rate for the year will be slightly lower than for last year. Under such conditions the health of the general population of the United States can not be very different.

The year 1940 got off to a very good start. In the first six months the figures were, month for month, either the lowest or next to the lowest record. Beginning with the summer, however, when the excessive heat wave contributed to higher-than-average mortality, the death rates for several months ran somewhat above the figures for the past two years. But the month of November again showed the lowest mortality on record. At the time of writing indications were that December would also make an excellent showing, in spite of an extensive outbreak of influenza on the Pacific Coast and sporadic instances elsewhere. Fortunately, the type of influenza does not seem particularly virulent and, so far, has not resulted in any appreciable rise in deaths from pneumonia.

One of the most noteworthy features of the year's record is the marked decline in deaths from pneumonia. Each year since the extensive use of type-specific anti-serums and the introduction of sulfanilamide and allied improved derivatives in the treatment of pneumonia, there has been a sharp drop in its mortality. Since these declines have occurred even in the periods when influenza was prevalent, we may expect that at last a method of control has been found for pneumonia, and look forward with confidence to the time when this disease will record only the negligible rates now in evidence for many of the other acute diseases.

The communicable diseases of childhood will register new low rates again this year, with three of them, namely, measles, scarlet fever and diphtheria, causing a death rate of less than one per 100,000. Even whooping cough will show a rate but little above this figure. Another children's disease even more important numerically is diarrhea and enteritis, which will also register a new low for 1940. When we realize that according to the mortality prevailing at the beginning of this century, one third of all persons born would eventually die from some acute condition, and that under present circumstances this ratio has been reduced to one sixth, we can appreciate the beneficial effects resulting from the progress in the

control of diphtheria, pneumonia, diarrhea and enteritis and similar diseases.

It also appears that 1940 may be added to the long series of years which have witnessed continuous declines in the mortality from tuberculosis. There has been a considerable slackening in the rate of the fall, however. For many years past, the annual decreases have been sizable, but so far in 1940, the drop has been negligible, namely from 44.8 per 100,000 for the January–November period of 1939, to 44.3 for the like part of 1940.

A very favorable feature of this year's report is the further decline in the mortality of mothers during pregnancy and childbirth. The puerperal death rate for insured women is down 11.1 per cent. for the first eleven months of the year. The 1940 rate will be the lowest ever recorded.

Now, having considered the favorable side of this year's mortality situation, to make the picture complete we must also note that there are certain diseases and conditions which we have so far failed to bring under control. These are mainly the chronic conditions characteristic of middle and later life, including diseases of the heart, kidneys, and arteries, and cancer, and diabetes. To a large degree, upward trends in mortality from these diseases are inevitable, simply because of the steadily increasing proportion of older persons in our population. Our resources in preventing or postponing the onset of these diseases and in curing them are quite limited. Despite this, it would be wrong to say that little is being accomplished.

As to cancer, early diagnosis and prompt treatment by surgery and radiation are increasing the number of cured patients. Diabetics, thanks to insulin, are living longer than ever before. Most of them are leading fairly normal lives and are able to work as well as other individuals of the same age.

The record for accidents is somewhat unfavorable. The increase in industrial accidents is probably a reflection of the speeding up of industry for national defense. In the last World War such an increase occurred. The entrance of large numbers of inexperienced workers into new occupations inevitably introduces its own particular danger. The urgent need of preparing for the safety of the nation may result in some sacrifice of safety for the individual. It is to be hoped, however, that industry will guard against any such tendency at this time, for it not only results in needless waste of human life, but also impedes the carrying out of the vital program of national defense.

Fatalities from motor vehicle accidents will exceed those reported in either 1938 or 1939, and may run as high as 34,500 for the country as a whole. The campaign for prevention of automobile accidents, which seemed to function so efficiently in 1938 and 1939, has not been so successful in the past year.

Considering the trend of mortality in recent years, it seems well assured that the public health will continue to

improve along many lines during 1941. Whether the excellent record of the last few years can be repeated or even excelled will depend largely on two or three factors. In the first place, much will depend upon the extent of the spread of influenza now in evidence on the Pacific Coast and other isolated points and upon the continuance of it in a mild form. A wide-spread epidemic of a more virulent type of influenza would not only increase deaths from that cause, but would also increase mortality of the older people suffering from chronic conditions.

A second factor which must be considered in a forecast of the mortality of 1941 is the effect of the draft on public health. The bringing together of many individuals who have not established immunity against the more common communicable diseases will undoubtedly increase the incidence of such diseases. We must be prepared for a possible recrudescence of epidemic cerebrospinal meningitis such as we had in the draft of 1917 and 1918. Fortunately the introduction of chemotherapy has put us in a better position to handle this disease than formerly. Likewise the recently developed vaccines for influenza and the type-specific antisera and chemotherapy for pneumonia should result in better control of the respiratory conditions.

A third factor which may affect unfavorably the 1941 mortality is the accident situation. As was noted before, the hazards resulting from the speeding up of industry for national defense must be guarded against to prevent an increase in such deaths.

However, in spite of these difficulties, which are very real, and which will require the best efforts of all those interested in maintaining the public health at a high level, I believe we can look forward to 1941 with confidence. We can continue to make progress in the saving of human life provided we take seriously our personal obligations to keep fit, and our community obligations to support our official and voluntary health agencies with sufficient resources to carry on their work effectively.—LOUIS I. DUBLIN.

PAPERS READ BEFORE THE AMERICAN PHYSICAL SOCIETY

DRS. ALEXANDER GOETZ and S. Scott Goetz, of the California Institute of Technology, reported to the American Physical Society that cells of brewer's yeast seem to act like giant molecules in a reaction with silver, affording an extremely delicate test for this and other metals. They gave a demonstration before the session, showing how the yeast cells could be used to reveal the presence of about three billionths of an ounce of silver. The test became possible after they had found a new method of staining the yeast cells. After this treatment the cells are examined under the microscope and those that have been killed by the metals can easily be distinguished from the others. By such an examination it is possible to measure the proportion of cells that the metals have affected. Using mathematical formulae, the amount of metal can be calculated.

In the electric eel, there is an electric impulse in the animal's electric organ which travels from tail to head

at a speed of half a mile per second, or even more, was reported by W. A. Rosenblith, of the University of California at Los Angeles, and Richard T. Cox, of New York University. These speeds, faster than any recorded nerve impulse, though far below the speed of electricity itself, were previously suspected, and have been confirmed by new measurements.

THOUGH the electron microscope, which takes pictures with electrons instead of light, has already been used to make magnifications as high as 25,000 times, a new method of using it may even increase its power. This method was described at the meeting by Dr. W. V. Houston and Hugh Bradner, of the California Institute of Technology. They use the microscope in two stages. First, electrons come from a filament similar to an electric lamp. These are focused by an electrical lens on a thin film which is to be magnified. The electrons passing through are then focused again by two magnetic lenses, either on a photographic plate, or a screen made of materials which glow with electron bombardment, and thus make the image visible.

PAPERS ON FORESTRY

THAT forestry, no less than manufacturing and agriculture, is an integral part of the national defense program and has an especially vital rôle to play in any unified program of land use, was pointed out by Ellery A. Foster, economist of the U. S. Department of Agriculture at the Washington meeting of the Society of American Foresters. "The new despotisms insist that our system is impotent to achieve a full use of science, a wise husbandry of resources, and full employment of labor. Their advocates say that we must forsake democracy in order to survive; that we must give unlimited powers to a dictator if we hope to compete." To meet this double challenge, the speaker continued, it is not sufficient to be alert and active on the federal front alone. State and private forces must carry a major part of the load, especially in the field of forest conservation and restoration. State foresters are offered unique opportunities to assist in upbuilding the national strength, Mr. Foster pointed out, because after years of being more or less ignored, they are now considered integral agents in land use planning in the majority of the states. And although this may look at first glance like long-range activity, many of its aspects have bearing on the immediate problems of the emergency.

Forty years of development in state and private forestry were discussed in review by Austin F. Hawes, Connecticut State Forester, and John B. Woods, of the Oregon Forest Fire Association, respectively, who also made recommendations for future developments. Greater use of state forests for recreation was forecast by Mr. Hawes, who suggested that woodmen might be bidden to "spare that tree," even when overage or an obvious silvicultural misfit, if it is in the neighborhood of much-frequented recreation areas. He also suggested the desirability of a unit for measuring the usefulness of a given forest area for recreation—some such concept as "man-days of hunt-

ing or fishing," to enable administrators to measure more accurately such uses of the woods and thus to determine policy. Mr. Woods called the particular attention of foresters to the problems faced by private owners of woodland in seeking protection against insect pests, forest diseases and the fire menace. In general, he said, private owners "have looked upon such problems as being beyond their power to solve. Yet they must be solved, somehow." He told how, in the Far West, groups of private forest owners pioneered in organization of regular patrols, cooperated to secure legislation making support of such activities compulsory upon all forest owners. Although federal and state forestry have since picked up part of the burden more than half of the fire-fighting expenditure is still borne by the private owners of timber tracts.

FIRE, for all the dread and devastation it creates in a forest, has played a vital rôle in forest development, according to D. K. Maissuraw, of New Haven, Conn. Mr. Maissuraw made detailed studies of trees in the great forested areas in northern Wisconsin. He found abundant evidence that there were great forest fires in that area long before white men came—as early as 1465. Other fires occurred in 1640, and were followed by development terminating in the present hardwood forest, now overmature and decadent. The rôle of fire, in undisturbed nature, seems to be very much like that of the lumberman with his ax and saw: it clears away tracts that have grown up to mixed hardwoods of uneven age, and lets new growth have a chance. In particular, the speaker stated, such natural fire clearance was responsible for starting the great stands of white pine, now mostly cleared away, that made fortunes for pioneer lumbermen, and provided a congenial seedbed for the Paul Bunyan legends.

PROPOSED CONSTRUCTION OF A SUPER-HIGHWAY SYSTEM

IMMEDIATE construction of an \$860,000,000 super-highway system, extending the Pennsylvania Turnpike to Boston, Richmond, St. Louis and Chicago, "is entirely feasible and practical," was discussed at the Detroit meeting of the Society of Automotive Engineers by Charles M. Noble, special highway engineer of the Pennsylvania Turnpike Commission.

"The highway engineer," he stated, "is prepared to solve the engineering problems, the construction industry is equipped to execute the construction with economy and dispatch, but the program can not be started until the legislator and the financier solve the problem of low interest and bond discount rates; for these rates will determine the fare the motoring public must pay, and it may be stated with certainty that the fares must be moderate in order to attract a sufficient volume of traffic to assure the success of an express highway system."

The system is the proposal of the Honorable Walter A. Jones, chairman of the Pennsylvania Turnpike Commission. From the present western terminus, east of Pittsburgh, would extend two branches. One, passing north of that city, would continue to Chicago, and its route would also go near Toledo and Cleveland. The other branch, to the south, would go close to Columbus, Dayton,

Cincinnati and Indianapolis, then to St. Louis. A cross route from Indianapolis to Chicago is suggested. From the east, a line is proposed to Philadelphia, which would cross, west of the city, another stretch from Boston to Richmond.

Mr. Noble explained certain points of the proposal as follows: "The initial system as proposed by Mr. Jones can be built and will be built if the great body of motorists, truck and bus operators, business and financial interests support the movement with determination and intelligence. It is hoped that the bus and truck industry will extend its support and cooperation to the movement. As stated previously, it would be preferable if express routes could be financed out of present motor vehicle revenues and thrown open to the public free, without requiring the user to pay a service fee for the greatly improved facility, but the situation in the several states is such that this does not appear possible now for any reasonable time in the future. Thus, I repeat, a choice must be made between doing without the facilities altogether or of accepting the principle of charging the actual users a service fare for the privilege of utilizing the benefits offered by an express highway system."

ITEMS

TRANSFER of heat by liquid is familiar to any one who lives in a house with hot-water heating. The water is heated down in the cellar and piped to radiators where it gives up its heat to warm the room. Many industrial processes make use of similar processes, but liquids other than water are often used, because they can be heated to a higher degree before they turn into steam. Therefore, a considerably greater amount of heat can be transferred. A melted mixture of salts, especially the nitrates and nitrites of sodium and potassium, has been recently devised for the purpose by three du Pont chemists, W. E. Kirst, W. M. Nagle and J. B. Castner. This can be used for temperatures between 290 degrees and 1,000 degrees Fahrenheit. Below this maximum the mixture is quite stable and can be used for years, but above 1,000 degrees there is a slow decomposition. The first extensive use of the new compound, which is known as HTS, is in the Houdry catalytic cracking process, for oil refining.

FARMERS can produce milk more economically by putting cornmeal into their silos along with the grass silage that is rapidly becoming one of the agricultural standbys of the country. For consumption by cows, it doesn't need to be the kind of cornmeal that goes into muffins. Cobs and all may be ground up, state W. H. Peterson and associates of the University of Wisconsin. The cornmeal serves as a preservative for the grass and other herbage with which the silo is filled, replacing the molasses or phosphoric acid commonly used, which the farmer has to buy for cash. It doesn't do quite as well, it is explained, but is a "good-enough" material to use, if there is corn on hand for the purpose. Another material which gives promise as an ensilage preservative is whey, a by-product of the cheese industry. It can be used either in the powdered form or as soured whey concentrate. However, whey powder as at present marketed is too expensive, and the soured concentrate is not yet available.