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THE DEATH RATE IN ENGLAND

A "REMARKABLY good wartime" death rate was registered in England and Wales during 1941 and the first three months of 1942, is reported by Dr. Percy Stocks, Medical Statistical Officer of the General Register Office in an article in *British Medical Journal.*

For 1941 the death rate, including violent deaths caused by the war, was 12.9 per 1,000 population. For the first three months of 1942, a period which almost invariably registers a higher death rate than the year as a whole, the total death rate, including deaths from violence, was only 14.8 per 1,000. For this same quarterly period in 1939, the rate was 15.1; for 1940, 19.9; for 1941, 17.5.

Even better index of the health of the country is the death rate from disease, which was 11.7 per 1,000 in 1941. During the same year, the United States, with the lowest death rate in the history of its death registration states, according to figures released by the U. S. Census Bureau, registered a rate of 10.5 per 1,000.

The infant death rate in England and Wales for 1941 was 58 per 1,000 live births. For the first quarter of 1942 it was 61, the lowest ever recorded in any March quarter. The birth rate was 14.2 per 1,000, compared with 14.9 per 1,000 in 1939 and 14.4 in 1933, the latter being the lowest hitherto recorded.

The most important increases in deaths from disease during 1941 were for tuberculosis, meningitis (cerebrospinal fever in the English records), whooping cough and dysenteries and paratyphoid fever. "Tuberculosis has given rise to some anxiety," according to Dr. Stocks. Infectious diseases registering decreases, despite the war, are typhoid fever, scarlet fever, erysipelas, gonococcal infections, late syphilis and, among males only, recent syphilis, rheumatic fever, ear and mastoid disease, two kinds of heart disease (pericarditis and acute endocarditis), diseases of the mouth and pharynx, gastritis, appendicitis, and infections of childbirth.

For penumonia, bronchitis and the like, "the cold winters and the conditions imposed by aerial warfare were unfavorable both in 1940 and 1941," Dr. Stocks reports. These offset the benefits of sulfa drug treatment of lobar pneumonia, so striking in 1938 and 1939, but the set-back has not been considerable. Bronchitis and bronchopneumonia, on the other hand, showed an excess of deaths in 1941, though not nearly so pronounced as in 1940.

Other diseases from which there was a noteworthy increase in deaths include: pernicious and other anemias, hemorrhagic diseases, Addison's disease, cerebral hemorrhage, heart diseases, epilepsy, mental disorders and ulcer of the stomach and duodenum.

Decreases, despite the war, were registered for gallstones and diseases of the gall bladder, pancreas, bladder and genital organs in both sexes; gout and diseases of the veins, skin, bones, joints and muscles in men; exophthalmic goiter, cirrhosis of the liver and toxemias of pregnancy in females; prematurity and birth injury in infants.

WORK OF THE WAR METALLURGY COMMITTEE

LEAD-SILVER in place of lead-tin soldering for tin cans is one of the recommendations of the War Metallurgy Committee and its Advisory Committee reported by Dr. Frank B. Jewett, president of the National Academy of Sciences, in a survey of the work of the two committees for the past eighteen months.

The substitution of lead-silver for lead-tin solder has been made in some fields. But in certain canning processes, difficulties are encountered which must be overcome by research before the substitution in this field can be ordered. Nevertheless, since a large proportion of the total consumption of tin is still used in soldering, such substitution in the canning industry is urgently needed.

The War Metallurgy Committee has at its disposal for war work more than 10,000 metallurgists in this country, research men, technicians, engineers. Their combined experience represents well over 125,000 man years. Heads of industries, university and research organizations also contribute their knowledge and experience. The results of Canadian and English research are made available.

The committee functions as a nerve center for the coordination and correlation of all this work, preventing duplications and mistakes and thus saving time and money. It portions out the work to various sub-committees and to organizations and groups best suited to carry on the particular kind of work needed. It serves also as a clearing house for the appraisal of new thoughts, new ideas, new shortcuts that may come from anywhere—and are coming in fast.

The chairman of the War Metallurgy Committee is Dr. Clyde Williams, director of the Battelle Memorial Institute, Columbus, Ohio; with Dr. Zay Jeffries, of the General Electric Company, as vice-chairman, and Louis Jordan, as executive secretary.

NEUTRON PICTURES

NEUTRON pictures in place of or to supplement X-ray pictures, taking advantage of the far higher penetrating power of neutrons—higher than 1,000,000-volt X-rays or even than the gamma rays of radium—are proposed in U. S. patent 2,287,619, recently issued to Hartmut Israel Kallmann and Ernst Kuhn of Berlin, Germany. The proposal is not new, and the invention is specifically confined to a compact self-contained device for producing the neutrons, slowing them down, that is, regulating their penetrating power, and protecting the operator and the object, especially when the latter is a living thing.

The preferred source of neutrons is a beryllium target bombarded by positive ions of heavy hydrogen, accelerated by application of 1,000,000 volts. This gives a volume of neutrons, the inventors say, equal to that obtained from 7 grams of radium intimately mixed with beryllium —more perhaps than has ever been gathered in one place.

This source gives fast neutrons which are then slowed

down to the desired penetration by varying thicknesses of a hydrogen containing compound, such as paraffin or paraffin oil. This compound serves also to insulate operator and specimen from the high voltage. For further protection, the whole apparatus is surrounded by insulating material and this again by a conducting shell which is grounded.

While the inventors stress medical applications, it is obvious that the apparatus is also suitable for other applications, and we may be reminded that slow neutrons are the ones that have figured in the search for atomic power.

THE CAUSE AND CURE OF CANCER

THE cure of cancer will be achieved before the cause is discovered, is the opinion expressed by Dr. Cornelius P. Rhoads in his report as director of Memorial Hospital, New York City.

Search for a chemical cure for the disease, consequently, is being carried on at Memorial at the same time that investigations into the cause of cancer are made. No chemical cure has been found yet, but a method has been devised for testing in the test tube the poisoning effects on the cancer cell of various chemical compounds. So far, some seventy different compounds have been tested.

"A type of chemical has been found," Dr. Rhoads reports, "which in the test tube appears to interfere with the health of one type of cancer cell of man, that found in cancer of the breast, and in the same concentration not to interfere with the well-being of any normal organ tissue so far tested. The chemicals which have this preferential anti-cancer effect are characterized by a common structure.

"The results may have a far-reaching significance. They prove apparently that there is a real difference between cancer cells and normal cells in their sensitivity to certain types of chemicals. The cancer is more sensitive and can be killed by compounds which do not kill the normal tissue. This observation alone is sufficient justification for the intensive continuation of the experiments."

Dr. Rhoads is not yet ready to disclose the name of the type of chemical found to have this preferential anti-cancer effect because the studies have not yet gone far enough to justify considering it as a cancer cure.

Surgical cures of breast cancer in the primary operable stage have been achieved in 51 per cent. of all cases and in 75.5 per cent. of cases of the most favorable type (with no extension of cancer from the original focus). These cures represent patients alive and well five years after the operation.

Attempts to find a cure for cancer by starvation of the cancer cell are being made. Preliminary steps, now under way, consist in studies of the diet requirements of cancer and normal cells.

Delving into the cause of cancer, Memorial chemists, with the help of Harvard University, are engaged on the task of searching for cancer-causing chemicals in the kidney excretions of patients. Certain classes of chemicals, not unlike naturally occurring body chemicals such as the sex hormones, are known to be capable of causing cancer. Scientists believe that a defect in body chemistry may result in the cancer-chemicals being formed from the natural ones. If so, they should be present in the excretions of cancer patients but not of normal patients.

The difficulty of searching for them may be understood from the fact that the chemist who first described the chemical structure of the male hormones was able to isolate from thousands of gallons of kidney excretions about as much of the hormone chemical as could be placed on the tip of a pencil.

VITAMIN A IN THE DIET OF INFANTS

THE average diet of babies from three weeks to six months of age does not supply enough vitamin A for maintaining optimal concentrations of the vitamin in the blood, was stated by Dr. J. M. Lewis and Dr. Oscar Bodansky, at the Gibson Island Conference on Vitamins. The average diet given to infants over six months, however, does supply enough of the vitamin.

This vitamin is required for growth and good health generally, and also to prevent night blindness or poor dark adaptation of the eyes. Growth, resistance to infections and dark adaptation, however, are not as good criteria of the body's vitamin A stores as measurements of the concentration of the vitamin in the blood.

It was found that this last measurement is "the best single criterion available at present for the diagnosis of vitamin A deficiency."

The reason why so little night blindness has been found in children and adults in recent surveys, when many were believed to be eating poor diets, is that dark adaptation becomes impaired only when the diet is markedly reduced in vitamin A. The last finding was made on investigations with rats.

Optimal growth, these studies showed, occurred in the rats when the vitamin A content of the diet was 5 to 12 times the minimum requirement. Optimal concentration of the vitamin in the blood was observed when the vitamin intake was 12 to 25 times the minimum requirement. Good storage of the vitamin in the liver was noted at an intake of 50 times the minimum requirement.

OCCUPATIONAL DRAFT DEFERMENT

OCCUPATIONAL draft deferment is recommended for students in training for certain sciences as well as for scientific men now engaged in critical war research work in an "Occupational Bulletin" being circulated by Selective Service Director Lewis B. Hershey to local draft boards and other Selective Service officials.

A list of critical occupations is included in the bulletin. These are sciences and specialized fields certified by the National Roster of Scientific Personnel as requiring long periods of training and as being jobs for which the necessary manpower does not already exist to care for war production and activities essential to the war effort.

They are: accountants, chemists, economists, engineers (aeronautical, automotive, chemical, civil, electrical, heating, ventilating, refrigerating and air conditioning, marine, mechanical, mining and metallurgical including mineral technologists, radio, safety and transportation), geophysicists, industrial managers, mathematicians, meteor-

ologists, naval architects, personnel administrators, physicists, astronomers, psychologists and statisticians.

"Careful consideration for occupational classification should be given," the *Bulletin* says, not only for men already engaged in these activities necessary to war production or essential to the support of the war effort, but also to undergraduate college students in training for them if they are in their junior or senior years or at or near the close of the sophomore year.

A graduate or postgraduate student who is undertaking further studies for these scientific and specialized fields may be considered for occupational classification if, in addition to his studies he is also acting as graduate assistant in a recognized college or university or is doing war research which is supervised by a federal agency. After a student graduates, he should be given sixty days' additional deferment to give him time to get a job in war production or other war work.—MARJORIE VAN DE WATER.

VEGETATION ON MIDWAY

VEGETATION on Midway is certainly nothing to tempt a botanically-inclined person to seek assignment to that far-flung outpost, even in quiet times. Botanists of the U. S. National Herbarium, with headquarters in the Smithsonian Institution, say that there are only twenty plant species native to the two scraps of dry sand that compose Midway, mostly belonging to groups found on other Pacific islands.

One reason for this is the geological youth of Midway. It is one of the most recent of small land areas to emerge above the ocean surface, hence has had little time to develop a vegetation. It is so far from other lands that about the only ways plants can get there naturally is for their seeds to be carried by long-flight birds or to drift in on ocean currents. Chances are against seeds being carried that far by the wind.

Among the scanty list of plants on Midway, however, are two that are almost unique to these islands. One is a kind of mint, the other a species of nightshade, related to potatoes and tomatoes. The nightshade species is found only on Midway and on Ocean Island, a small neighboring bit of land.

The mint once formed part of the vegetation of Laysan, a tiny uninhabited island about a third of the way between Midway and Hawaii. With all the rest of the vegetation of Laysan, this species was wiped out by rabbits. The animals were accidentally introduced in 1903, multiplied by thousands and within ten years had nibbled away every scrap of plant life on Laysan, leaving the two square miles of its surface a sandy desert.

Two new plant species have recently been purposely introduced on Midway. They are San Francisco grass, brought in to bind and stabilize the shifting sand, and the ornamental shrub, oleander. A number of unintentional introductions were also made, when weed seeds arrived as stowaways in soil brought in by boat, so that the crew of the cable station could have a vegetable garden.

Whether there will be any further unintentional additions as a result of present intense military activities on the island is a question that can not be answered yet.

ITEMS

MAGNESIUM, though being used in enormous quantities for airplane production, is not going to be stinted to growing plants that need it, C. W. Whittaker and W. M. Ross of the U. S. Department of Agriculture have determined, after a critical survey of the fertilizer situation. Magnesium is an absolute "must" for all green plants—their food-manufacturing green pigment, chlorophyll, can not be formed without it. However, very little magnesium satisfies their requirement, and most soils naturally contain enough. Where soils are short of the element, a magnesium salt must be added to the fertilizer mixture. Before the war, American needs were met with a compound known as kieserite, imported from Germany. With this cut off by blockade, we can readily meet our needs by using dolomite, a magnesium-containing limestone, where long-time results are required. Where quicker action is needed, heating the dolomite makes it more soluble and hence more readily available to plant roots.

TOUGH cords of a special type of rayon, replacing cotton, permit thinner but stronger walls, add thousands of miles to the life of the tires, and save tons of rubber from which more tires may be made for army tanks and trucks. Applied to the airplane, the lighter tires permit heavier guns and bombs to be carried, and thus increase the fighting power of the plane. These are the claims made by E. I. du Pont de Nemours and Company in describing the new process by which they produce stronger rayon, rayon with a tensile strength of 70,000 pounds per square inch. The increased strength, the manufacturers say, is mainly due to stretching the filament immediately after it is formed. This is similar to the cold drawing of steel which so remarkably increases its strength. Partly responsible also is the use of cellulose derived from cotton instead of from wood pulp as for ordinary rayon.

"VICTORY lunches" that follow food-for-freedom diet rules are now being served to war workers in the cafeterias of three major plants of the Westinghouse Electric & Manufacturing Company, is announced by Dr. Frank M. Gatto, Pittsburgh director of health conservation. For 30 cents, workers can now get meals consisting of a liberal helping of meat, fish or eggs; vegetables; whole wheat or enriched bread; butter; and milk or a milk dessert. The lunches are planned to provide at cost a substantial portion of the daily requirements of vitamins, minerals, sugars and starches, proteins and fats, the foods people need to keep physically fit. Workers at the Westinghouse plants, Dr. Gatto reports, have swung to such nourishing foods as fruits and milk for mid-shift snacks. Recent surveys of the snack wagons that tour the plants show demands for oranges have tripled. From snack wagons and cafeterias come reports that Westinghouse employees are now eating 50 per cent. more green vegetables, 25 per cent. more salads, 10 per cent. more milk, and have doubled their consumption of carrots and lettuce.