

Editorial.

THE STATE OF THE PUBLIC HEALTH.

IN an editorial published in the April number of the Journal we dealt with the sections of Sir Arthur MacNalty's Report dealing with vital statistics and epidemiology.

In Section V on maternity and child welfare Sir Arthur states that these services had their origin in voluntary effort. He writes that: "In the eighteenth century Sterne, in 'Tristram Shandy,' describes how the wife of a parson had a poor widow trained to become the parish midwife and paid the fees for the ordinary's licence to enable her to practice. Lying-in hospitals were established in populous centres and similar work was done by the maternity departments of the voluntary general hospitals and by the Poor Law hospitals. The Midwives Act of 1902 reduced the ranks of unqualified handy women, and the Central Midwives Board brought the practice of the midwife into order. The duty of inspecting midwives was vested in the County and County Borough Councils. Similarly, child welfare centres began on a purely voluntary basis, and the Local Authorities are now the heirs of this work. Much of the value of these centres still depends on voluntary effort and on the helpful co-operation of County, Municipal and District Nursing Associations."

Though great advances have been made in medical science and public health services, the death-rate of women in childbirth has remained almost unaltered. The number of mothers who died in childbirth in 1935 was 2,457—a small number in comparison with the number of births, which was 598,756. Yet it is estimated that at least one-half of these deaths might have been prevented.

In 1935 the death-rate was 4·11 per 1,000 live births, compared with a rate of 4·6 in 1933; this reduction, though welcome, is not enough.

For nearly two years specialist medical officers of the Ministry, in conjunction with the Medical Officers of Health of various areas, have been investigating the causes of maternal deaths. The investigation has not been completed, but it is known from the findings of the Departmental Committee that an efficient service of salaried midwives is essential, and for this reason the Minister of Health introduced the Midwives Bill in 1936 instead of waiting for the special investigation to be completed.

Experience has shown what can be done by a well organized midwifery service. The number of deaths among mothers attended by nurse-midwives employed by a nursing association is only 2 per 1,000 births—about half the national rate. The midwives sent to the homes of mothers by two voluntary hospitals in the East End of London have during the last ten years lost less than one mother per 1,000 live births.

The main purpose of the Midwives Act is to supplement these services by setting up a comprehensive service of salaried midwives who must be whole-time servants of the body that employs them, but need not give the whole of their time to midwifery. Under the Act, midwives in practice will be required periodically to attend courses of instruction and so keep up to date in their methods. Those appointed to the new service will be assured of adequate remuneration.

In the section devoted to tuberculosis attention is drawn to the fact that sociological problems arising from tuberculosis in the household are often as urgent in the interests of the patient and of the family as the medical treatment of the individual sufferer. Home conditions may interfere with the fulfilment of the instructions and supervision given by the staff of the dispensary. The spread of infection may be minimized by the loan of beds and bedding enabling the patient to sleep alone; the family may need to be transferred to a larger house. In London and Sheffield there are excellent housing schemes for the tuberculous, and in Sheffield the rent of the home may be paid on condition that the patient occupies a separate bed and bedroom, that no lodgers are taken, and that the tuberculous person shall attend the dispensary and be advised by the Tuberculosis Officer. The Care Committee can work hand in hand with the local authority in these rehousing schemes.

In other instances it may be desirable to make arrangements for the boarding out of the children of infected parents so as to allow the mother to go away for treatment. Such a scheme is now in operation by the London County Council.

As regards after-care work, it is stated that the first two years after leaving a sanatorium are very critical. The patient must live in as healthy an environment as possible, and should only work in an occupation suitable to his condition. Usually these requirements can only be satisfied by life in a village settlement such as the Papworth Village Settlement. But a large proportion of patients cannot get such treatment; and for them small workshops have been established at Bristol, handicraft centres in London boroughs, and municipal workshops in Northamptonshire.

It is suggested that a more hopeful field would be the provision of workshops at sanatoria. Birmingham has a workshop of this nature at the Municipal Sanatorium.

There have been considerable falls in mortality from respiratory tuberculosis during three out of the last four years. In 1935 there were 11,186 fewer deaths from tuberculosis than in 1925, although the population had increased during the interval, and the figures for 1935 constitute a new low record, probably aided by the absence of undue prevalence of influenza and by favourable climatic conditions.

In the Chief Medical Officer's report for 1934 reasons were given for the

belief that the Local Government Act of 1929 had improved the efficiency of the venereal diseases schemes of Local Authorities. The experience of 1935 has shown further evidence of activity of Medical Officers of Health to improve the Venereal Disease Treatment Centres and to strengthen the links between venereal disease and other branches of the Public Health Service.

There were 185 Venereal Disease Treatment Centres in England and Wales in 1935. The annual returns of the centres afford reliable evidence of the incidence of syphilis in this country. Cases of syphilis dealt for the first time at the centres rose to a maximum of 42,805 in 1920, then fell to 22,010 in 1924 and remained stationary until 1932, when a new fall commenced and in 1934 a low record of 20,692 was reached. The fall continued and in 1935 the number was 19,335. There has been a steady fall of congenital syphilis in the numbers at each age group except that of 15 years and over.

An important question is the effect of venereal schemes on the wastage of life from late manifestations of syphilis. This wastage generally occurs between 30 and 60 years of age when people are of the greatest value to their families. In discussing the late effects of syphilis it is stated that the field is practically limited to three diseases: General paralysis of the insane and tabes dorsalis, which are always due to syphilis, and aneurysm which is caused by it in a very high proportion of cases.

Deaths from general paralysis of the insane, however, are no longer an index of the late effects of syphilis as the disease is now curable by malarial therapy. The mortality from tabes dorsalis is also not a good index as the disease is often arrested and little is known of the effects of modern treatment. Deaths from aneurysm may be the best index, but this is complicated by the fact that during the Great War a large number of men were infected with syphilis. Between August, 1914, and November, 1918, approximately 100,000 men in the British Army (excluding Dominion, Colonial and Indian forces) were treated for syphilis; and between the close of the war and demobilization the incidence of venereal disease in the Army greatly increased. One would expect this increase would be evidenced by late effects of syphilis. A graph of G.P.I. supplied by the Board of Control shows as regards admissions that there was a marked fall from 1918-20, then a rise occurred in 1922 and 1923, and after this there was a gradual fall to 1935. In the four years 1931-34 the direct admissions were 23 to 25 per cent fewer than in the four years 1911-14 and the deaths were less than half. The explanation of the marked fall in 1918-20 is not easy; the institution of the Venereal Disease Scheme in 1916 could hardly be responsible for the decline in deaths from G.P.I. shown in the Registrar-General's returns, seeing that this effect of syphilis does not usually show itself until ten years after infection. Deaths from tabes dorsalis have shown no striking changes in numbers since 1920, and deaths from aneurysm show an increase, but the rates for males in the

age-period 30 to 60, when this effect of syphilis generally manifests itself, show fairly substantial decreases.

The number of deaths from cancer was 64,507, or 1,244 in excess of the previous year. The deaths among males were 30,780, and those among females 33,727. The total mortality-rate of 1,587 per million of the population living shows an increase of 24 over the previous year. The mortality figures alone provide little evidence that the efforts to obtain control of this disease are making headway.

The increase in mortality is affected by the increasing longevity of the population and the more accurate diagnosis of the disease. When these factors are taken into consideration it is considered quite fallacious to assume that the increased frequency of the disease connotes a greater prevalence of whatever factors are concerned in the causation.

The subject of cancer has been of great interest to the Ministry for the last thirteen years or so, and it is claimed that advances have been made in investigations of causation, improvements in diagnosis and treatment, and even, to a limited extent, in prevention. *Ætiological* research has in the main been concerned with carcinogenic substances and virus diseases.

In an editorial last month we gave full details of the researches carried out on these lines for the British Empire Cancer Campaign. The most significant discoveries have been the demonstration that the carcinogenic substances in tar, etc., are closely allied in chemical constitution to the sterols, bile acids and sex hormones produced in the human body, and that some derivatives of them are active cancer producers under experimental conditions. Very important also are the discoveries that malignant tumours of fowls can be transmitted without the intervention of living cells, presumably by a virus; and that a carcinogenic substance may exhibit the feature of transmissibility by cell-free extracts so characteristic of the virus-produced tumours. It has also been found that a tumour transmissible to a mammal can be produced by a cell-free extract, and that an apparently simple tar tumour may display malignant characters following injection of cell-free filtrates of the naturally occurring tumour.

The development of instruments of greater precision, particularly in the sphere of radiology, has increased the ease and certainty with which the disease can be identified. Early diagnosis has also enabled treatment to be given when it is more likely to be effective.

Notable advances in treatment have been made by the substitution of radiation methods for operative treatment. They can be used in cases in which operation would be impracticable. But they are not to be regarded solely as substitutes to operation methods. They play an important part as adjuncts to operative treatment.

Prevention, unfortunately, is limited mainly to those cancers which have been recognized as due to occupational risks, such as needless exposure to

radiations by those engaged in the manufacture of radio-therapeutic appliances. X-ray cancer is now almost extinct. The elimination of skin cancers due to exposure to mineral oil, tar, soot, etc., may now be confidently expected as a result of the researches to avoid or counteract the carcinogenic action of these substances.

During the year under review the Ministry's Advisory Committee on Nutrition has been reconstituted and enlarged. It has presented a memorandum to the Minister of Health and the Secretary of State for Scotland on the nutritive value of milk. The memorandum calls attention to the fact that milk contains, in a form ready for utilization by the body, practically all the materials essential for growth and the maintenance of life. It points out that the present consumption of milk is only about 0·4 pint per head per day and in many families it is much less. It suggests that children should have daily between one and two pints, and expectant and nursing mothers about two pints. A minimum of half a pint of milk a day is desirable for an adult, especially as calcium frequently deficient in a diet is most conveniently given in the form of milk. Dietary studies, tests of nutritional efficiency, and milk investigations are being carried out for the Ministry.

Attention is drawn to the importance of protective foods, and a recently published report from the City of Bristol Public Hospital Services claims to show that an increase in protective foods in a dietary is of value in the presence of intestinal affections arising in the inmates of an institution.

The Milk (Special Designations) Order, 1936, the Bacteriological Grading of Milk, and the Supervision and Control of Pasteurizing Plants are discussed at length. We have drawn attention to these subjects in Editorials published in 1936, and no new points have been brought to notice since then.

In the Section on imported foods there is a note on the bacteriological quality of butter. Samples of Russian butter examined in the Ministry's laboratory were found to be entirely satisfactory and free from pathogenic organisms. Samples of butter from Australia and New Zealand were examined bacteriologically and by animal inoculation: they were of good bacterial purity and no suspicion of the presence of pathogenic organisms was indicated in any sample. Similar results were obtained with samples of Danish butter. Samples of English butter were also examined: they proved less clean than samples examined from Australia, New Zealand and Denmark and also from Russia.

In 1935, 137 outbreaks of suspected food poisoning were reported to the Ministry. Of these 116 were investigated in the Ministry's laboratory; 12 were excluded as not due to food poisoning. Of the remainder 53 were due to *Salmonella* infection, and in 46 a *Salmonella* was isolated either from the patient or some article of food or from both. In 12 outbreaks dysentery bacilli—*Sonne*, *Flexner*—were responsible for the attacks.

In forty-seven outbreaks the symptoms suggested a bacterial "toxin";

the majority of the foods concerned were canned fish, potted meats, and pickled or pressed beef. Corned beef outbreaks which used to be the commonest toxin outbreaks have practically disappeared, only one being reported to the Ministry. This disappearance is probably due to the efficiency of modern canning of beef.

From the suspected food cultures of staphylococci, usually *aureus*, were obtained in twenty-one instances, in nearly all these the staphylococci predominated so greatly over other bacteria that their connexion with the toxicity of the food was highly probable. It is thought that other bacteria, especially streptococci, may grow vigorously in food without causing change in its appearance or taste. It is probable that their toxicity is due to enormous growth and the presence of excess of bacterial protein, rather than to any toxin or product of protein decomposition.

A large outbreak in Lancashire was traced to meat infected with *B. typhi murium* (aertrycke). The meat was eaten as pressed beef. An unusual outbreak in Yorkshire was attributed to a cook who was suffering from an untreated sinus wound. Pus from the sinus contained *B. typhi murium* in pure culture. This was the type isolated from the cases who consumed the food prepared by the cook.

The first recorded outbreak of botulism in Great Britain occurred in 1922; since then there had been no authenticated cases until 1935 when three deaths due to botulism occurred in the North of London. The cause of the illness was the consumption of a vegetarian food called nut-meat brawn contained in air-tight glass jars. *Clostridium botulinum* was isolated from the remains of the nut-meat brawn which had been eaten by the patients who died of botulism. *C. botulinum* occurs in soil and it is probable that the vegetables used in the preparation of the nut-meat brawn were contaminated with this organism. *C. botulinum* is an anaerobic spore-bearing organism, and it is considered that the two hours steaming to which the brawn was subjected would not kill the spores. During its growth the microbe produces a toxin and it is this which is responsible for the production of botulism.

Exposure to a temperature of 120° C. for four minutes will kill the spores, but obviously it will take a considerable time for food packed in air-tight containers to attain a lethal temperature. In this connexion what is known as "home-canning" of vegetables is especially fraught with danger. An examination of the records of a number of outbreaks of botulism in the United States has shown that outbreaks attributable to the consumption of home-canned products are much more numerous than those attributable to factory-canned products.

Later in the month of August another fatal case occurred in London. The findings at autopsy were consistent with death from botulism and the remains of the food eaten were proved to contain a certain amount of toxin neutralizable by botulinus antitoxin in animal experiments. Dr. A. A. Miles reported the isolation of *C. botulinum*, type B, from the

food. This is the first occasion in which this type of the botulinus bacillus has been obtained in this country in connexion with a human case.

In the section devoted to Statistical Research attention is drawn to a statement of the Government Actuary that the graduated rates of mortality for males show a maximum rate at 23, followed by a decrease to the age of 26, when the minimal rate occurs: thereafter the rates steadily increase from age to age. In the case of females there is no instance of decreasing rates of mortality in this span of life, but there is a decided retardation in the progression of the rates. It is suggested that as the feature is more pronounced in males than females, there must be some special factor operating at these ages, and that is probably the increasing share of accidents in total mortality. The kind of accident is death on the roads and in the air. In 1920-22 the death-rate per 100,000 of males aged 20 to 25 from the principal categories of accident was 39.9. Road and air transport accounted for 9.5. In 1930-32 the rate was 65.4 and road and air transport accounted for 43.2. It would appear that out of every 10,000 young men attaining the age of 17 about 75 per cent will have died a violent death before reaching the age of 30, if the rates of 1930-32 hold.

Among the investigations carried out under the Auxiliary Scientific Fund was an investigation under the direction of Professor Topley on nasopharyngeal flora. Some interesting results were obtained in connexion with "colds." Examination of muco-pus collected in sterile handkerchiefs showed that while the discharge was merely watery cultures yielded at most but a few white staphylococci. Once the discharge became thick and yellowish, however, significant results were always yielded by cultures. Though the data are not extensive they support the view that the acute "cold" is initiated by a filtrable virus, while bacteria play an important part as secondary invaders.

Malaria therapy has been continued at Horton under Colonel S. P. James, F.R.S. During the year 122 patients received treatment, the particular species of malaria used were *P. vivax* (69 cases), *P. malariae* (35 cases), *P. falciparum* (16 cases), and *P. knowlesi* (2 cases). Trials were made with *P. knowlesi* to see if it could be used on a large scale in place of *P. vivax*. Similar trials are being conducted in Edinburgh and Roumania. In several recent years other species of malaria than the benign tertian type have been supplied for cases which had ceased to react to infection with that type, or for which a second course of treatment was required. Twenty hospitals were supplied with quartan malaria for that purpose, and one hospital with malignant tertian.

Following on the researches of Rogoff and Stewart, Hartman and his co-workers, and of Swingle and Piffner, preparations of suprarenal cortex have been used for the treatment of Addison's disease. Swingle and Piffner describe the principle isolated by them as the "adrenal cortical hormone."

Some physicians claim that the cortical hormone is as valuable in the treatment of Addison's disease as insulin in diabetes.

The objects of the treatment are to ward off death in a crisis and to ameliorate the general symptoms.

Cameron writes that when treatment is commenced early, patients may be maintained for many years in normal health and working capacity.

Recent research on diabetes by Himsworth and by de Wesselow and Griffiths seems to show that the severe form of the disease occurring mainly in young subjects, and the comparatively mild form in older patients, may have a different ætiology. Himsworth has suggested that the efficacy of insulin depends on the presence of an insulin-sensitizing factor, and a type of diabetes may occur not due to lack of insulin but to deficiency of the sensitizing factor. Two types can be distinguished, the "insulin sensitive" in which insulin produces immediate suppression of hyperglycæmia and the "insulin insensitive" when it has no effect. The nature of the factor is not known. The "insulin insensitive" type appears to be more common in the elderly and the "insulin sensitive" common in the young.

Professor de Wesselow and Griffiths have considered the possibility of the pituitary having a relation to diabetes. They found that the blood-plasma of elderly diabetics when injected into rabbits diminished the hypoglycæmic action of insulin in a manner resembling that found by other workers to result from the injection of extracts of the anterior pituitary gland. Plasma from young diabetics and normal controls had no such action. The relation of these findings to those of Himsworth is not clear.

These researches at any rate indicate that the clinical differentiation of diabetics into two main types rests on a sound ætiological basis and emphasizes the importance of further research on the influence of the endocrine glands, other than the pancreas, in connexion with the genesis of diabetes.

Important work on the treatment of diabetics by protamine insulate has been done during the past year by Hagedorn and his associates. By combining insulin with certain protamines Hagedorn claims that it is less rapidly absorbed and is taken up by the organism at a more even rate. It is not asserted that the new preparation can entirely replace insulin and that it is suitable for the treatment of all cases of diabetes. The rapidity of absorption of insulin is of great importance in diabetic coma and other emergencies. The protamine preparation has been found valuable in severe cases of diabetes, especially those in which "insulin reactions" are experienced in greater or less degree. It is especially in the night that these reactions are most troublesome to the patient, and the best results are stated to be obtained by giving protamine insulate in the evening, and ordinary insulin in the morning. In this way the risk of hyperglycæmia in the night is avoided, and the high level of sugar in the morning controlled.