POSSIBLE DEVELOPMENTS IN SOCIAL MEDICINE*

BY

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The war, by increasing the interdependence of each member of the community, has stimulated the development of new social concepts and experiments. The widespread interest of the medical profession in social medicine is symptomatic of this new impulse, and has already been made into a potent force by the inauguration of departments of social medicine in the universities of Oxford and Birmingham.

It has been customary in the past to accept as a working hypothesis the belief that most diseases have a single and specific cause. This belief was fostered by the discovery of bacteria and the demonstration of their specific relation to certain diseases, and was fortified by the subsequent discovery of the specific immunity which often follows infection.

Social medicine extends the conception of aetiology beyond the immediate or specific cause to non-specific and often multiple causes—a point elaborated by Prof. Ryle in the Gilchrist lecture (1942). This conception may be applied to diseases which have a well-defined specific cause—for example, tuberculosis and typhoid—as well as to those with a more indefinite aetiology. It is true that the tubercle bacillus causes tuberculosis and the typhoid bacillus causes typhoid, but it is equally true, and of more practical use in preventing these diseases, to say that overcrowding and undernutrition cause tuberculosis, and that impure water supplies and contaminated foodstuffs cause typhoid.

In addition to these external environmental causes there are individual factors depending indirectly on the external environment. Not all of those who are bacteriologically susceptible to an infective disease will develop it. Other links which must be introduced into the aetiological chain are the subject's state of nutrition, the presence of excessive fatigue, and possibly other influences as yet unknown.

Pavlov (1910) described "equilibration with surrounding Nature" as the "fundamental law of life." It is the disturbance of this equilibrium between man and his environment which produces most physical and mental illness. In congenital and inherited disease the equilibrium is disturbed by agencies within the individual, independent of environmental influences. In most other diseases environmental defects play an important and often decisive part in overthrowing this balance which is health.

Claude Bernard referred to the blood and tissue fluids which bring nutrients to the various organs and remove the waste products as the *milieu intérieur*. The patient's external environment, which consists chiefly of his dwelling, his diet, the conditions of his work, the nature of his leisure, and his relations with his family and fellow men, might be called his *milieu extérieur*. It is the relation of disease to the *milieu extérieur* with which social medicine is concerned.

It would be wrong to assume that the advent of social medicine marks a revolution in medical thought or any break in the continuity of medical progress. What is implied by the new name is, I think, a shift of emphasis. Some doctors have always believed that much disease results from bad environmental conditions. Now many more doctors, perhaps the majority, have come to that conclusion.

Sir Wilson Jameson (1942) has shown how advances in social medicine are stimulated in wartime. The development of mass radiography, the expansion of the industrial health services and rehabilitation schemes, and the introduction of a food policy based on health needs have been accelerated by the stimulus of the urgent needs of war. But the facts on which these advances are based and which compel attention to the social aspects of disease were already established before the outbreak of war. Numerous authors had demonstrated the evil effects on health of an inadequate diet, overcrowding, and unhealthy conditions of work.

One of the most important publications in this country establishing the need for a social approach to the problem of disease is the report of the Registrar-General on Occupational Mortality (1938). This is the first occasion on which mortality rates have been given for different social classes as well as for different occupations, and also the first time that the mortality rates of wives grouped according to the occupation of the husband are given.

The report divides the population into five social classes on the basis of occupation as given in the 1931 census returns. The professions are placed in Class I, skilled workers in Class III, and unskilled workers in Class V, with two intermediate groups. The following facts from the report are among the most significant from the point of view of social medicine. The mortality rates of diseases of the respiratory system, ear and mastoid disease, valvular heart disease, and gastric and duodenal ulcer, and the infant mortality rate increase steadily as the social scale is descended, so that the rates are approximately twice as high in Class V as in Class I. In pregnancy and childbirth the death rate is 50% higher in Class V than in Class I, and in the second year of life the death rate in Class V is five times that of Class I.

The social distribution of some of the commoner forms of cancer is often overlooked, although this report demonstrates a definite relation between social grade and cancer of the "exposed" sites. Death rates from cancer of the tongue, tonsil, jaw, pharynx, oesophagus, stomach, larynx, skin, and uterus are approximately twice as high in Class V as in Class I. Possibly those in the higher occupational groups seek treatment earlier, but this factor can, however, have little effect on the mortality rates of cancer of the stomach, which is almost invariably fatal however early treatment is sought, and in cancer of the stomach there is a steep social gradient in the mortality rates.

The Registrar-General's report testifies to the existence of a mass of preventable disease of social origin. It raises many problems which would appear to be accessible to research in social medicine. It shows, for instance, that there are influences in the environment of the lower occupational groups which produce high mortality rates for all the principal respiratory diseases. What are these adverse factors and how can they be prevented? We know that overcrowding is an important factor in the production of tuberculosis, but we do not yet know for certain why steel workers suffer a high incidence of pneumonia (Registrar-General, 1938), nor what part dust and exposure play in the production of chronic bronchitis and emphysema. It has been shown by Midgley Turner (1938) that cancer of the lung is significantly more common in foundry workers and metal workers than in the general population, and Argyll Campbell (1943) has proved that dusts encountered in the heavy metal industries produce a significant increase in the incidence of pulmonary tumours in mice. But the specific agent or agents responsible for the high rates of cancer of the lung or larynx in these industries have still to be established, and methods of prevention devised. The high death rate from valvular disease of the heart in the lower occupational groups is mainly due to the late results of rheumatic fever. Morris and Titmuss (1942) analysed the relation between rheumatic fever and environment, and concluded that rheumatic heart disease was due to some condition associated with poverty, not necessarily overcrowding. Miller (1942) gives evidence supporting the hypothesis that damp houses are the cause of juvenile rheumatism, while Glazebrook and Scott Thomson (1942) found that a supplement of vitamin C prevented the occurrence of cases of acute rheumatism in a group of 335 boys, whereas in a control group of 1,100 there were 16 cases. The problem of the aetiology of acute rheumatism still awaits a complete solution, although it is now certain that environmental factors are of major importance. The infant mortality rate has long been recognized as an index of social conditions. Malnutrition, overcrowding, and infected food are important causes of high infantile mortality rates, but it is not accurately known how these causes operate and to what extent other factors are involved. These are a few of the problems that confront social medicine; the list could be extended indefinitely.

* Received for publication July 12, 1943.

Social medicine appears to me to open two new doors in medical practice. The first leads to a new attitude to disease, and the second to a new technique for its conquest. I think that one of the first questions a medical student should be trained to ask himself when confronted with a sick person is, "To what extent has this patient's environment contributed to the aetiology of his disease?" and when the diagnosis has been made, "To what extent will the treatment and prognosis in this case be influenced by environmental conditions when he leaves the hospital?" Because it is a new way of looking at disease it should not become a special branch, but should be welded into the clinical curriculum at all points. Above all, it should not be excluded from the stimulating and vitalizing influence of bedside medicine.

The new technique which social medicine offers is one for an extended study of aetiology. If the maximal results are to be obtained a definite method is desirable. Such a study might consist of the following five stages:

1. An inspection of the vital statistics relating to the aetiological problem under consideration. A possible cause of a high disease rate may be suggested by statistical evidence, but this can only be proved or disproved by a close study of individual cases.

2. The "trace-back" stage, consisting of a detailed study of individual cases of the disease in question with special reference to a detailed environmental history checked by personal observation of the patient's *milieu extérieur*.

3. A survey of an adequate sample of the population exposed to the environmental conditions under suspicion, together with a control group not so exposed. A number of latent or early cases of the disease might be discovered in the exposed group at this stage.

4. An attempt to reproduce the condition in experimental animals.

5. The last stage, in which the hypothesis would be proved or disproved, would consist of modifying the environment of an exposed group of the population by removing or neutralizing the suspected adverse characteristics and noting the effect on the incidence of the disease in question.

The individual worker would find it difficult, if not impossible, to complete such an investigation alone. The collaboration of hospital and domiciliary doctors, research workers, statisticians, nutrition workers, sanitary inspectors, social workers, inspectors of factories, works managers, public health doctors, and local authorities might all be required to carry through to a successful conclusion an experiment of this sort. The human element and the diversity of types and conditions encountered might at times baulk and confuse the inquirer, who would find that there were more variables than he could at first control, but I do not believe the difficulties are insuperable. Moreover, the integration of the medical services, to which we can now look forward with confidence, will facilitate the search for the sources of disease by bringing together in one organization workers in curative and preventive medicine.

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BLIND PHYSIOTHERAPISTS

The school of massage for blind men and women, established by the National Institute for the Blind in 1915, is to be enlarged. It will remain in the same building as the Eichholz Clinic in Great Portland Street, London, where another of the extensive floors is to be added to the school premises. During its career the school has undergone sundry changes, but all have been in the cause of progress. As the only training centre in the world exclusively for sightless physiotherapists, the Institute has regarded it a point of honour to maintain a high degree of efficiency, a policy that has established the blind masseur as second to none in the profession. One reason for enlarging the school is the proved success of the "educated" blind and the increase in this category brought about by the growing number of young people passing through the National Insti-

tute's two public schools, Worcester College for blind boys, and Chorleywood College for girls with little or no sight. Worcester was much enlarged shortly before the outbreak of war, but already it is filled to capacity; Chorleywood also is nearing the point where more accommodation will be needed for myopic girls eligible for secondary education. Beyond these sources of potential students for the massage school, account must be taken of blinded war casualties in the fighting Services and civilian population, among whom are bound to be many persons desirous of, and suitable for, training. A matter to which full attention must be given is the demand of the profession itself. The blind practitioner cannot lag behind the advancing technique, and the curriculum at the school must be adjusted accordingly. The present two-year course puts severe pressure on the students, and a longer course will probably have to be introduced soon. It is to meet the challenge of modern developments and to help more young blind persons of ability that the National Institute has decided to embark on the extension scheme.

THE TREATMENT OF WAR WOUNDS WITH PENICILLIN

The following is an account written for us by Prof. L. P. Garrod of a report published by the War Office entitled, "A Preliminary Report to the War Office and the Medical Research Council on Investigations concerning the Use of Penicillin in War Wounds—Carried out under the Direction of Prof. H. W. Florey, F.R.S., and Brig. Hugh Cairns, F.R.C.S., R.A.M.C." This report is for official use only, but we are permitted to publish an abstract of its contents.

This printed report of 114 pages is in two parts: a general account of the investigation and its results by Florey and Cairns, and 12 detailed descriptions of particular classes of case by individual surgeons, including numerous fairly full case histories. The work described was carried out in North Africa during a period of only 3 months last summer, in order to ascertain as quickly as possible how penicillin can be used to the best advantage in treating battle wounds. The best use of very limited supplies involved discovering how to obtain good results by local treatment only, since this is far more economical than systemic administration. No attempt was made deliberately to compare penicillin treatment with any other—a much more formidable project.

Methods of Administration

Penicillin was applied locally either as a solution in distilled water containing 250 units of calcium penicillin per c.cm., as a powder in which calcium penicillin was diluted with sulphanilamide to give a strength of 500, 2,000, or 5,000 units per g. (in a few cases it was used undiluted), or as a cream in a lanette wax base. Systemic treatment was achieved by intramuscular or intravenous injection of sodium penicillin by continuous drip in glucose saline, the daily dose being usually 120,000 units: owing to impurities in some of the batches used injection by the former route caused pain and by the latter febrile reactions and early venous thrombosis. There were no serious toxic effects. A good plan was to give intramuscular injections for 1 day after operation, then start on intravenous drip, and revert to intramuscular injections later if necessary. Some loss of potency occurred, especially in calcium penicillin, owing to climatic conditions and transport: doses stated are therefore maxima and the probable true dose was up to 30% less.

Chronic Wound Sepsis

The first phase of the investigation was the treatment in Algiers by Lieut.-Col. Ian Fraser of a series of septic wounds from 3 weeks to 4 months old. These cases were accommodated in a special 30-bed ward, and full bacteriological control was carried out by Major Scott Thomson. Local treatment with solution, powder, and cream was disappointing: accessible surfaces could be sterilized, but deep-seated infection could not be controlled. Systemic administration was resorted to in 8 cases of septic compound fracture, 4 of which received over 1,000,000 units; this lavish treatment cleared up the infection in 6.

It was concluded from this experience that long-standing sepsis with loculated abscesses and poor general condition was a relatively unpromising field, and that cases should be treated earlier. Almost ideal arrangements for this were possible when the campaign in Sicily opened. Lieut.-Col. Fraser and