

Notes, Short Comments, and Answers to Correspondents.

THE INCIDENCE OF FATAL RHEUMATIC HEART DISEASE IN BRISTOL, 1876-1913.¹

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IN the Annals of the Gloucestershire Medical Society¹ it is stated that on July 29th, 1789, Mr. Edward Jenner "favoured the Society with Remarks on a Disease of the Heart following Acute Rheumatism, illustrated by Dissections." At the same time Dr. David Pitcairn, who was physician to St. Bartholomew's Hospital from 1780 to 1793, was teaching—to quote Sir Norman Moore²—"that valvular disease was a frequent result of rheumatic fever." Since their day the cardiac lesions have come to be regarded more and more respectfully, while at the same time it has become clear that the joint lesions, though painful for a time, lead but seldom to any lasting impairment of function. The present-day view is, indeed, that carditis is the disease and polyarthritis one of the complications. To use Sir Norman Moore's³ words again: "Remembering the unwillingness of men and women to learn that they have diseases associated with the lungs or heart, I feel that 'heart fever,' which would be an appropriate term for a disease of which the most serious feature is endocarditis, would have little chance of coming into use instead of rheumatic fever. Were it not for this difficulty on the side of public opinion the term 'heart fever' might with advantage be adopted for that morbid condition in which endocarditis, transient arthritis, and raised temperature are always present." The instructed point of view, then, is that acute infective pancarditis is a specific disease complicated by polyarthritis, chorea, and so on.

This view is borne out by more minute inquiry into the nature of the disease. When I was a senior student at St. Mary's Hospital Dr. F. J. Poynton and Dr. A. Paine⁴ were publishing their papers on the "*Micrococcus rheumaticus*." I was able later⁵ to bring support to their views by showing that the tissues react in a certain definite way to the attack of this micro-organism; while in 1912 Dr. R. H. Miller, Dr. E. H. Kettle, and I⁶ found that the reactions provoked by experimental inoculation with the micrococcus were similar in essentials to those found in man.

Now, I assume that everyone is agreed upon the vital need for getting rid of rheumatic carditis and its crippling results. This can only be done by discovering first the means by which the organism gains its access to the cardiac tissues. For reasons I gave long ago,⁷ reasons apparent to all who study the subject, it seems clear that there is no question of continued reinfection of the host from without; the history of the disease is one of attack after attack, at intervals of months or years, extending over a decade or even more. The organism, therefore, is one that persists in the body for long periods. General considerations lead me to suppose that it is not in the cardiac tissues themselves, but at some point within the body, outside the circulation but with ready access to it, that it lives on from one outbreak to the next. Most likely it is closely related to the cocci that normally live on the mucous surfaces, especially those of the alimentary tract. Thence it passes into some intermediate tissue (probably the lymphoid aggregations), where its virulence is enhanced to the level of pathogenicity. From this in turn it escapes into the blood serum, under conditions predisposing to its increase in virulence, in small but repeated doses, and attacks the heart with irremediable results.

It has therefore seemed to me worth while to try and find out something about the external conditions that predispose to pathogenic action by this micro-organism. With this end in view I set out to explore the incidence of rheumatic heart disease in Bristol, in its relation to time and place. The difficulties of notification are very great, so I did not feel called upon to attack the problem in that way until I had tried a simpler method. Hospital figures, again, are so obviously incomplete as to furnish nothing except what would mislead. It did not seem possible to approach the matter except through the death registers of the city. This was undertaken, therefore, with the aid of a grant from the Research Committee of the University of Bristol Colston Society. I have also had the benefit of much advice from Dr. D. S. Davies, the medical officer of

health for Bristol; and the skilled and energetic assistance of his clerk, Mr. W. N. Brown, of whose help I cannot say too much. Indeed, with so much support I feel I ought to have accomplished far more than I have done.

The Method of Investigation Used.

The method adopted was to go through the death registers from 1876 to 1913 inclusive. Deaths from "acute rheumatism" and "rheumatic fever" were noted, also deaths from "rheumatic heart disease," "rheumatic pericarditis," and so on; and after much casting about I decided to include also all deaths from "pericarditis" and "endocarditis" occurring before the age of 25, unless the cause of the lesion was stated to be something other than rheumatic infection. (I chose this age after investigation of the age-incidence of rheumatic infection of the heart from hospital records.) I assume that practically all these deaths are due to the cardiac lesions, even where the certificate does not mention cardiac manifestations.

What I was trying to do was to make a list of deaths from active rheumatic infection of the heart. For the purpose of relating the onset of infection to locality and season it would be useless to include cases of post-rheumatic heart disease, since the course of many of these covers several decades and removes the death far from the time and place at which the infection first began. For the purpose of estimating the number of deaths attributable in each year to rheumatic infection of the heart and its after-effects I made lists for the years 1876, 1886, 1896, and 1906, which included deaths not only from the causes I have named but also from heart disease of all kinds before the age of 40 (excluding congenital lesions and ulcerative endocarditis). Anyone who has examined numbers of cases of cardiac disease post mortem will agree that practically all such cases are of the rheumatic type. Syphilis rarely kills by its cardiac lesions before 40. In these four years I have named, the average annual number of deaths from rheumatic heart disease as I have defined it, in all its stages, was 71 (73, if deaths from chorea be included) in an average population of 251,974. This, I feel sure, is an under-estimate, because many people do not die of post-rheumatic heart disease till after 40, and also because many cases of ulcerative endocarditis (not included in my total of 73) are due in part to a previous rheumatic infection of the valves. And even if the figure were correct for the mortality bills, they render no account of the progressive crippling of activity during the productive decades which is so deplorable a feature of the disease. As it is it seems to me serious enough to think that for every million city dwellers there should be 300 deaths from this disease each year; for I take it that Bristol is no worse off than other British cities in this respect. Curves of death-rate show that the death-rate from rheumatic heart disease is not dropping as sharply as the general death-rate. It is therefore a matter serious enough to justify a searching inquiry.

I am only too aware of my amateurish methods and unsatisfactory data. Before I had gone far into the death registers I saw that these records were not accurate enough to justify any minute deductions, yet it did seem to me that they might, on searching, reveal some features so striking as to give one a lead to further inquiry. I am afraid I cannot claim any very convincing results; but such as they are I bring them forward.

Seasonal Variation of Fatal Rheumatic Carditis.

The first point to which I ask your attention is that fatal rheumatic carditis appears to own a seasonal variation. The incidence is maximal in December and January, minimal in July and September. This corresponds broadly with rheumatic fever curves from the Scandinavian countries (Newsholme⁸). Comparison with charts of average rainfall and mean temperature seems to show some relation between high rheumatic incidence and low rainfall, and also high monthly mean temperature. In order to examine these possibilities in more detail a chart was prepared, by means of which we were able to compare, month by month, the rheumatic incidence with the rainfall and the mean temperature. There were six principal "spikes" upward in the rheumatic curve; in 1877, 1881, 1886, 1893, 1901, and 1911. The first two and the last two coincided with a low rainfall, but there was no clear relation to the temperature curve. Again, on six occasions the monthly rainfall exceeded 7 inches, and each occasion coincided with a low incidence of fatal rheumatic heart disease. Further, a sustained drop in the rainfall appeared to be followed by an increase of fatal carditis. The same fact has already been observed, in regard to rheumatic fever, by Sir A. Newsholme,⁹ and on much wider evidence. He explained it by saying that scanty rainfall caused a warm and dry subsoil, usually with an exceptionally low ground water. But a similar examination of the temperature curve fails to prove that it had any definite relation to the rheumatic incidence.

Geographical and Geological Inquiries.

The possible effect of locality was explored by marking the houses in which a death from rheumatic infection had occurred with a dot for each house, on a map of Bristol

¹ Read to the Thirty-first Congress of the Royal Sanitary Institute at Birmingham.

coloured to show the various geological formations. A street index of the deaths was also prepared. It must be confessed that neither of these plans brought to light anything definite. No epidemic was discovered, unless one takes note of a group of eight cases occurring within seven weeks (November and December, 1893) in a small area in the south-west centre of Bristol. During the same period only one other death was noted in the whole of the rest of the city. A search for "rheumatic houses" was fruitless. Only 11 houses were found in which more than one death from rheumatic infection had occurred; and in none of these had there been more than two such deaths. Moreover, in these instances examination of the facts did not warrant any belief in the house as a factor in the causation of the disease.

The map shows no relation between the geology of the city and the rheumatic incidence. Neither does it support the view that this disease is particularly fond of river valleys. The banks of the Avon and the Frome, with their ramifications, are not studded with dots in the map.

There are four areas in the city where 19, 20, or 21 dots are to be found within a square, the side of which is one-quarter mile in length. There is nothing in common between these areas except that they are all of them crowded with inhabitants. One of them is low down on a river bank, another is raised a little way above the river level by a sharp slope, a third is on one of the sharp inclines that rise steeply from the centre of the city, and the fourth is on the edge of Durdham Downs, on the upper limestone. As to density of population, it does not seem to me possible to prove that the high incidence of fatal rheumatic heart disease in these areas means anything more than that where more people live there also more people die. I have tried to find some relation between the incidence of carditis and the density of population by comparing the ascertained densities of the various registration areas with the rheumatic death-rates in those areas, but no such relation can be discovered.

Suggestions for Further Investigations.

Yet there is one last point of some significance. When he was preparing the charts Mr. Brown pointed out to me that the extensions of the city in 1897 and 1904 did not add much to the total numbers of deaths from rheumatic infection. Indeed, when we examine the curve of rheumatic death-rate we find that these inclusions coincided with a drop in the rate. When outer areas were added to the relatively congested centre a fall in the rheumatic death-rate took place. Is it not probable that the explanation may lie in the relatively rural and uncrowded character of the areas brought in? I think this is a possibility well worthy of exploration. This leads me to conclude with a brief outline of plans for further research. The present inquiry shows that rheumatic infection of the heart is killing 70 or 80 people every year in Bristol, to say nothing of the decade or more of lessened efficiency that precedes a majority of those deaths. The mortality figures, imperfect though they are, do not point to any great natural fall in the incidence of this disease. They show that when the city has been "countrified" by inclusion of partially rural areas the death-rate from this disease has fallen. The winter rise in its seasonal curve is at the most only partially explained by reference to climatic conditions. Is it not possible that there is an economic factor in the causation of this infection?

To put such a question is one thing; to answer it is another. But it does appear to me that we ought to try. Data as to the incidence of rheumatic carditis must be collected from an area wide enough to include rural as well as urban districts. The first difficulty is to determine what we are to regard as rheumatic carditis. I do not at present know of any specific test, and we must rely on the judgment of the practitioners in the area selected, aided by some kind of definition of the cases to be noted, and, if possible, by referees with special knowledge of the disease for doubtful cases.

I think some little time should be spent in explaining the nature of the investigation, so as to enlist the enthusiastic help of the medical men concerned. For the reports which they would be asked to make adequate payment must, of course, be arranged. I do not know of any area more suitable from the economic point of view than that surrounding Bristol, and I hope it may be possible to organise the inquiry in that area. It will take two or three years to get ready for it, but I believe my Bristol colleagues will help, while so far as Gloucestershire is concerned it seems to me that the medical organisation which we all associate with the name of Dr. Middleton Martin will greatly facilitate these preparations. And I must confess that it seems to me peculiarly fitting that we should look for a lead in this matter to the general practitioners of the very county in which that prince of general practitioners and clinical observers, Edward Jenner, read to the Medico-Convivial Society of Gloucestershire in the parlour of the Fleece Inn at Rodborough, "Remarks on a Disease of the Heart following

Acute Rheumatism," which entitle him to claim with Pitcairn the honour of initiating the campaign that we are now taking up against this crippling and destructive infection.

References.—1. Quoted in Brit. Med. Jour., 1896, i., 1296. 2. Lumleian Lectures, THE LANCET, 1909, i., 1159, 1227, 1297. 3. Loc. cit. 4. Researches on Rheumatism. 5. Journal of Pathology and Bacteriology, 1911, xv., 489. 6. THE LANCET, 1912, ii., 1209. 7. THE LANCET, 1904, i., 565. 8. Milroy Lectures, Brit. Med. Jour., 1895, i., 527, 581. 9. Loc. cit.

PESTILENCE IN THE NEAR EAST.

UNDER the title of "Health Conditions in Eastern Europe: Typhus a Serious Menace," Major F. Norman White, I.M.S., C.I.E., delivered an important lecture under the auspices of the Chadwick Trust at the Surveyors' Institution, Gt. George-street, Westminster, on July 15th, Sir William J. Collins being in the chair. Major White, who is a medical officer under the Ministry of Health, has just returned from Eastern Europe, where, as Commissioner for the Typhus Commission of the League of Nations, he has been visiting the infected areas. The countries chiefly considered were Latvia, Esthonia, Lithuania, Poland, and the Ukraine, all situated on the border of Soviet Russia.

The Conditions in Russia.

With regard to Russia, said the lecturer, detailed information was lacking, but it was known that health conditions were appalling, and the incidence of typhus and other epidemic diseases had been exceedingly high. The deplorable situation in Russia was one of the chief contributory causes of the unhealthy conditions now prevailing in the countries under consideration. It was, however, difficult to appraise the degree of credence that could be awarded to such vital statistics as emanated from Russia in existing circumstances. He had been informed by Dr. Haden Guest, who had just returned from a mission to Russia, that during 1918-19-20 Russia and Siberia had been swept from end-to-end by typhus fever and that scarcely a town or village escaped. It was stated that some 50 per cent. of the doctors attendant on typhus fever patients had died of the disease. Recent cables stated that cholera is widespread in Southern Russia and is causing there a very high mortality.

Poland's Handicap.

Of the states involved Poland was the largest and the conditions there would apply almost equally to the neighbouring states. Through Poland passed most of the main lines of communication by road and rail connecting Russia with Western Europe, consequently the efficiency of Poland's organisation was a matter of very direct concern to Central and Western Europe. Poland, too, had suffered more from epidemic diseases than had her smaller neighbours and her task was the most difficult, though similar in kind. Poland's strenuous efforts to work out her own sanitary salvation in spite of overwhelmingly important preoccupations entitled her to special consideration. Poland was a densely populated country for its degree of industrial development, with 250 persons to the square mile. Sanitary conditions, even before the war, were in a deplorably backward condition. Only three towns of what was now Poland had anything like an up-to-date water-supply, and in Warsaw alone was there any modern system of sewage disposal. Facilities for cleanliness in the form of public baths and other conveniences were extremely deficient. Scavenging was inefficiently carried out. The standard of personal cleanliness was low, especially in the poor Jewish quarters of the towns. The death-rate was very high, though coincidentally a very high birth-rate (40.6 per 1000 in 1910) was probably a marked feature of the vital statistics. Tuberculosis was prevalent in the towns. The infantile mortality-rate was excessive. The deaths of children under one year of age in the Austrian part of Poland during the quinquennium 1906-10 averaged 205 per 1000 births. Epidemics closely followed the outbreak of hostilities. In 1915 in a small part of Galicia that was free from Russian occupation there were 19,000 cases of typhoid fever, 11,000 of dysentery, 8000 of typhus, 21,000 of small-pox, and 29,000 cases of cholera. As the war progressed affairs became progressively worse. In 1917 the deaths outnumbered the births in every town and district of Poland. In that year the tuberculosis death-rate in Warsaw was 7.3 per 1000, and in Lodz 11 per 1000. Infantile mortality rates were higher than ever, and such diseases as rickets were said to be increasingly prevalent.

Typhus, Checked and Unchecked.

A serious epidemic of typhus still raged, more especially in Eastern Galicia, the conditions for its spread being particularly favourable owing to the devastation caused by war and consequent overcrowding. In Congress Poland 325,000 houses had been destroyed, and in Galicia 438,000. Soap, fuel, and other essentials to cleanliness were unobtainable in most parts, and elsewhere difficult and costly to obtain; changes of clothing were difficult to get; lousiness among the poor population was almost universal; dirt and

squalor characterised the poor quarters of the towns; privation, want, and disease had diminished the vitality and lowered the resistance to infection of large masses of the population and produced a condition of apathy that would be difficult to overcome. Over and above all this there had been a constant and continuous stream of civil and military refugees crossing the Polish borders, many of them infected with typhus contracted in Russia; the vast majority of them were infested with lice and other vermin. Between November, 1918, and January, 1920, 653,000 prisoners of war of all nationalities passed westwards over the Polish frontier, as well as 627,000 emigrants returning to Poland. These were all registered in the various posts through which they passed. In addition, some large numbers of refugees from the neighbouring war zone crossed the border. This primary source of infection of many diseases continued to operate. It was estimated that there were still a million persons in Russia waiting to be repatriated, and refugees and prisoners of war continued to increase the dangers of infection. All these unfortunate people came from areas where disease was already out of hand. The cessation of hostilities between Poland and Russia would not mean an immediate amelioration of these conditions and resumption of cross-frontier traffic, and trade would have its attendant public health dangers. In 1919 there were no less than 231,000 cases of typhus notified in Congress Poland and Galicia, and probably at least half the total number of actual cases were unnotified. During a short tour which he (the lecturer) made last month in Eastern Galicia scarcely a town or village was free from typhus, and this at a time of year when conditions should have begun to improve. There were good grounds for regarding the outlook for Galicia next winter as serious in the extreme.

The persistence of typhus was, perhaps, a better index of insanitary conditions than is furnished by any disease. Where typhus abounded there most other epidemic diseases could flourish. In temperate climates, if conditions were such that typhus could not flourish, the incidence of most other communicable diseases was likely to be low. Dangerous foci of epidemic disease were of more than local importance; mankind could not with impunity suffer plague spots to persist, especially when situated in the midst of civilised Europe. Persistence of present conditions would entail a never-ceasing vigilance on the part of the health authorities of more happily placed countries such as our own, and even then the disease might break through our barriers. This was well illustrated by the serious epidemic in Holland, a peaceful, well-fed, and prosperous country, in 1918. The menace of typhus was a very real one.

Interaction of Disease and Social Unrest.

The persistence of typhus and other epidemic diseases in Poland and adjacent countries was in part an economic question. High prices, scarcity of food, underfeeding, overcrowding, were all factors that no epidemiologist could overlook. Undue prevalence of disease might in its turn be directly responsible for such economic conditions as prevailed in Eastern Europe, and was a factor of great moment in keeping the populations in a state of constant ferment. Improved economic conditions were almost impossible in existing health conditions. At the root of inefficient labour, deficient output, and industrial unrest there often lay a removable pathological cause whose consideration would lie within the legitimate scope of the public health of to-day. Prevalence of disease might likewise play no insignificant part in the production of such social unrest as at present characterised Russia. A return to more normal conditions—political, social, and economic—on the continent of Europe had little likelihood of being attained unless and until the health conditions underwent substantial ameliorations. Excessive prevalence of disease, too, had a markedly deleterious effect on the physique and development, both physical and mental, of the rising generation, while education was retarded. All these things were factors in unrest.

Present and Future Needs.

The League of Nations had recently created a Typhus Commission, whose function it would be to aid the Eastern countries in their great health task. It was hoped that two million sterling would be raised, the minimum amount necessary to render adequate help. In addition the League of Red Cross Societies was issuing an urgent appeal to supplement the work that was already being done by voluntary societies. It was very desirable that adequate funds should be forthcoming sufficiently soon to enable next winter's epidemic of typhus to be forestalled. In the Baltic States conditions in regard to typhus fever had somewhat improved; Finland appeared to be practically free from the disease. In Esthonia there were less than 200 cases, in Latvia 879, and in Lithuania 590. In these countries American Red Cross doctors were rendering valuable aid in controlling the disease. There was very little typhus at present in Roumania, and it was chiefly confined to the Northern districts bordering on Galicia, the Ukraine,

Bessarabia, and Maramures. In the Ukraine conditions had been very bad, and from 10 to 15 per cent. of the population had succumbed to typhus or relapsing fever. But generally the outlook was grave enough to call for immediate palliative measures. The lecturer's recent visit to Poland on behalf of the League of Nations had been made with the primary object of ascertaining how foreign countries could best supplement Poland's efforts in the anti-typhus campaign. The best possible use was already being made of the very inadequate resources, and the energy displayed by the Chief Epidemic Commissary in Galicia was worthy of admiration. The plan adopted by the Polish Ministry of Health included arrangements for the establishment of a series of quarantine and observation stations along the Eastern border of all the main roads and railways, where refugees and emigrants could be cleansed, fed, and clothed, each station having a hospital attached to it; the establishment of hospitals in each district for the reception of cases of infectious diseases, also the establishment of corps to clean up infected houses and villages; and the installation in towns and villages of bathing, cleansing, and disinfecting plants. Essential, however, as this scheme was in all its details, it was quite beyond the resources of the Polish Government at the present time. Additional hospital material for at least 20,000 beds with full equipment was needed at once, disinfecting apparatus in large amount was required, clothing for refugees was an indispensable necessity, and would entail a very large expense. The rags of the refugees fell to pieces if attempts were made to rid them of vermin, and during the next twelve months something like two million shirts and a proportionate amount of other clothing would be called for. Soap in almost unlimited amounts was required, and certain foodstuffs for the quarantine stations and hospitals were needed, together with transport vehicles. Doctors and nurses were required to supplement the work of the insufficient and overworked Polish medical personnel. Only adequate help from more fortunately placed countries would rid Europe from what was a very real peril.

In concluding, the lecturer paid a warm tribute to the work of the American Red Cross, the "Hoover" Organisation, the European Children's Relief Fund, which during the past few months had provided 1,300,000 persons with one meal a day, the Jewish American Joint Distribution Committee, the National Alliance of American Poles, the Society of Friends, the American Typhus Relief Expedition, the Polish Red Cross, the British Red Cross, and the League of Red Cross Societies.

PUBLIC HEALTH IN TASMANIA, 1918-19.

SOME important advances in public health legislation in Tasmania were made by the passing of the Hospitals Act (1918), the Midwives Act (1918), and an Amendment to the Public Health (Venereal Diseases) Act of 1917. By this last measure a medical practitioner who has reason to believe that a patient suffering from venereal disease intends to contract marriage is directed to notify his belief to the chief health officer, who shall thereupon inform the other party to the proposed marriage or the parent or guardian of such party. No liability for defamation shall be incurred by a practitioner making such notification in good faith. Dr. A. H. Clarke, the acting chief health officer, considers that the same privilege should be extended to practitioners making similar communications in good faith in the case, e.g., of men with syphilitic sores on their hands who have the handling of food for human consumption. It is satisfactory to learn that the venereal disease notifications, numbering 366, during the 12 months from July, 1918, to June, 1919 (of which 307 were for gonorrhœa), were 77 less than in the 12 months preceding. Dr. Clarke points out, however, that "until facilities are provided in every important centre of the State for the treatment of persons suffering from venereal disease it will not be possible to grapple with this important health problem." Diphtheria was prevalent (737 cases and 17 deaths), but evidently in a very mild form; about a quarter of the cases occurred in Launceston. There were 189 cases of phthisis and 144 of typhoid fever throughout the State and no other disease prevalence of any importance. Dr. Clarke describes the scheme of operations that was decided on in the event of influenza appearing in epidemic form in Tasmania, but happily no cases had occurred up to the date of this report (August, 1919).

THE GOLDEN RULE AS APPLIED TO TUBERCLE.

GIVING evidence on Feb. 3rd, 4th, and 5th, at Washington, before the Committee on Public Buildings and Grounds of the House of Representatives, Dr. E. R. Baldwin emphasised the need for providing attractive, as well as hygienic, accommodation for consumptives. "..... Whatever buildings the United States Government constructs, my advice would be, as a tuberculosis specialist, and as a patient myself, not to put the tuberculosis soldier in a place you would not be willing to go to yourself. That is the crux of the thing."