

ARCHAEOLOGY

Studies of the social causes of tuberculosis in Germany before the First World War: extracts from Mosse and Tugendreich's landmark book

Shaun Murphy^a and Matthias Egger^b

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The purpose of this article is to highlight the significance of a book and a social medicine movement, both of which appear to be almost unrecognized outside of German-speaking countries. The book is *Krankheit und Soziale Lage* (Illness and Social Position). It was edited by Max Mosse and Gustav Tugendreich and was first published in 1913. (A new edition was published in 1977 by Jürgen Cromm and page numbers here refer to the third reprint of 1994.)¹ In order to put in context the book and the movement from which it emerged, the historical background is discussed, but there is no intention to provide a thorough historical analysis of developments in this period. After consideration of the purpose of the book, the chapter on tuberculosis is discussed in detail, and finally reference is made to the contribution of eugenic ideas to social medicine at this time.

The growth of social medicine in Imperial Germany

Although previously expressed by many individuals at different times in different countries, the notion that the aetiology of many diseases has a social component was systematically pursued for the first time in the German-speaking countries in the period immediately before the First World War. Many doctors became convinced that major improvements to the health of the public could only be made if housing, sanitary, and working conditions were improved for the majority of the population. Most of these doctors held positions in the state and city authorities of Imperial Germany or worked for the new health insurance funds. George Rosen,² and more recently Andreas Mielck,³ have discussed how these doctors promoted a large number of investigations into how social factors influenced the origin and course of illnesses.

The origins of social medicine in Germany are associated with the work of Rudolf Virchow and Salomon Neumann. Their early ideas, and the influence of the typhus outbreak in Silesia in 1847 on Rudolf Virchow, following which the term 'social

medicine' was used for the first time, have been discussed by a number of authors.^{2,4}

In 1871 Germany was unified for the first time by the creation of the German Empire. Prussia dominated this confederation of states and the King of Prussia became the German Emperor. The economy of Imperial Germany grew substantially in the period from 1890 to 1913, at an average annual rate of about 4.5%.^{ref.5 p. 21} There was enormous growth in the electrical engineering and chemical industries. Between 1888 and 1913 employment in the electricity, gas and water sector increased by over 350% and in the chemical industry by over 150%.^{ref.5 p. 23} By 1913 the German share of world trade almost equalled that of Britain and was twice that of France.^{ref.6 p. 167} There were huge differences between the rapidly expanding industrial centres and the agricultural areas, as well as marked social and economic differences between the constituent states of the Empire. Large numbers of people continued to move to the cities from the countryside, particularly from the Eastern provinces. Germany was a dynamic, heterogeneous and, at times, almost chaotic society.

'The expanding cities lacked an adequate infrastructure of housing, education, sanitation and medical care. In addition to the purely economic costs of wages and machines, industrialisation involved human and political costs, with sickness and poverty on an unprecedented scale.'^{ref.7 p. 11}

The government of Bismarck formulated legislation to alleviate some of the worst consequences of unregulated capitalism. The government hoped that the welfare schemes, which were paid for by compulsory contributions from employers and employees, would dent the growing popularity of radical socialist ideas. Sickness insurance was introduced in 1883 and this was followed later in the same decade by invalidity benefits, accident insurance and pensions. Initially sickness insurance was not available for all workers, and partners and children were not included, but the numbers covered gradually increased from 9% of the population in 1885 to 21% in 1911. In Berlin the coverage rose from 19% to 43% over the same period.^{ref.8 p. 184} Insurance funds were the principal reason for the growth of registered doctors whose numbers increased from 13 728 in 1876 to 34 136 in

^a Department of Social Medicine, University of Bristol, Canynge Hall, Whiteladies Road, Bristol BS8 2PR, UK. E-mail: shaun.murphy@bris.ac.uk

^b Department of Social and Preventive Medicine, University of Berne, Switzerland.

1913.^{ref.8 p. 99} Although rigorously regulated by the state, the sickness insurance funds were autonomous bodies governed jointly by employers and insured workers. Many trade unionists and members of the Social Democratic Party (after it was legalized in 1890) took part in the administration of the sickness insurance funds.^{ref.7 p. 17} Overall employment in health insurance and health services more than tripled in the period 1888–1913.^{ref.5 p. 23} The related increase in discussion of health, hygiene, and welfare issues was an important element in social integration in this fractured time.

‘Welfare (*Fürsorge*) became one of the most influential concepts of the pre-1914 period. Maternity welfare, infant welfare, youth welfare, family welfare, workers’ welfare—the subspecialisms sprouted as the ranks of welfare professionals multiplied, with women playing a crucial role. An enlarged housing inspectorate, mother-and-child clinics, public health campaigns against alcoholism, tuberculosis and venereal disease: all were manifestations of the drive to “improve” the population.’^{ref.9 p. 349}

After the discovery of antiseptics, and then bacteria specific to infectious diseases such as anthrax and tuberculosis in the late 1870s and early 1880s, the germ theory of disease was proposed. Some doctors argued that bacteria were the main answer to questions of aetiology but, in the late 1880s, others began to reassert that social factors were more important.

In 1897 Adolf Gottstein published a book on infectious diseases called *Allgemeine Epidemiologie* (General Epidemiology),¹⁰ a term which he used to encompass all the biological and social elements relevant to infectious diseases. He saw the argument between the bacteriologists and those for whom social factors were critical as a continuation of the 100-year-old dispute between the contagionists and the localists. The terms of the argument changed as new ideas emerged and new evidence came to light, but the contagionists stressed the importance of the organism which, they believed, caused disease when transmitted to humans, while the localists believed disease was generated by the environmental qualities of the place where people lived. Gottstein’s own beliefs had changed with time.

‘Originally a convinced contagionist, I increasingly learnt later, at the sick bed itself, to appreciate that chance transmission of an infectious agent is the final factor in the origin of epidemics, and that much more fundamental causes are to be sought in the fields of genetic inheritance or social conditions.’

The literature of social medicine flourished as the welfare movement became stronger; bacteriology was increasingly seen as only one contribution to the problems of public health. A large number of books were published^{10–15} and new journals were established such as the *Archiv für Soziale Medizin und Hygiene* and the *Zeitschrift für Soziale Medizin*.

The term social medicine and the related term social hygiene embodied three main themes: firstly the idea that social factors were a major contributor to the aetiology of many diseases; secondly eugenic notions that the genetic make-up of a population was an important factor in determining the health of

that population and that, if the gene pool was allowed to degenerate over generations, public health would suffer; and thirdly the belief that health services should be provided by the state. Definitions of the terms social medicine and social hygiene varied according to the emphasis put on each theme and the terms racial hygiene and hereditary hygiene were also used by some when focussing primarily on eugenics. The disagreement and conflict between individuals about the relative importance of these issues has been well described by Paul Weindling.^{ref.7 pp. 215–25} Ignaz Zadek in Berlin and Ludwig Teleky in Vienna were socialists and they shaped their views of social medicine accordingly. Zadek argued that the state should provide free medical care for all¹⁶ and this policy was adopted by the German Social Democratic Party in 1893. Teleky was appointed to a post in social medicine in Vienna in 1907. He worked on occupational diseases and linked these studies with his political activity.¹⁴ Zadek was one of the founders of the Association of Socialist Doctors which refused to join the Association for Social Medicine, Social Hygiene and Medical Statistics. The latter was founded by less radical practitioners of social medicine—Alfred Grotjahn was a leading figure and Adolf Gottstein was a vice-president—and stressed the importance of social conditions and welfare improvements in contrast to the predominantly bacteriological outlook of the Berlin Society for Public Health. Grotjahn, Gottstein and others in the mainstream of social medicine thought that eugenics was an important component of social medicine but there were those who considered eugenics as paramount. Amongst the latter group were racists such as Alfred Ploetz, a founder of the Racial Hygiene Society, who was dismissive of Grotjahn and Gottstein’s Association because of its emphasis on social conditions and because many of its members were Jews.^{ref.7 p. 225}

Mosse and Tugendreich’s *Krankheit und Soziale Lage*

Krankheit und Soziale Lage (Illness and Social Position) was edited by Max Mosse and Gustav Tugendreich and first published in 1913.¹ Both authors worked in Berlin. Max Mosse was Professor of Medicine at Berlin University and Gustav Tugendreich was a senior doctor at one of Berlin’s infant welfare centres. Max Mosse was a member of the rich and successful Mosse family; his uncle, Rudolf was one of Berlin’s leading newspaper proprietors. His areas of expertise included physiological and pathological chemistry, histology, and haematology.^{ref.17 p. 548} Gustav Tugendreich was a paediatrician and has been described as the father of public infant welfare in Germany. He completed his medical studies in Leipzig in 1901 and quickly specialized in paediatrics and infant welfare. His work was so highly regarded that in 1911 he was offered the directorship of an institution for combating infant mortality that was sponsored by the Empress. He declined the offer as a condition of the post was that he give up his Jewish faith.¹⁸

Over 800 pages long, *Krankheit und Soziale Lage* reviewed research on the relationship between social position and illness by considering major social factors (e.g housing, nutrition, and work), the most important diseases of the period (e.g. tuberculosis and sexually transmitted diseases), and the health and fitness of women, schoolchildren and the military. The final chapters of the book describe the social changes needed to

improve public health in general and the health of the working classes in particular. The full list of chapter headings is shown in Table 1.

In the introduction to the book the authors set out their purpose.^{ref.1 pp. 1–4}

‘In this book the influences of social circumstance on the prevention, origin and cause of diseases will be shown, as well as the means by which these influences can be mitigated or avoided. A difficult task, difficult because the cause of the origin and course of diseases is just as little a singular entity as the concept “social circumstance”. Both are much more complex things.

All conditions which initiate or favour diseases, and which human society and culture have created, in contrast to those which occur naturally, must be described as the influences of social circumstance on health status and as the social causes of diseases.

Certainly both groups, the social and the natural (biological), are usually working together. It is precisely this circumstance which complicates clear aetiological understanding and was, and is, the main reason why practitioners of social hygiene and laboratory scientists so often talk at cross purposes, are unable to understand each other, or come into conflict. The fiercest dispute was kindled when the new science of bacteriology discovered the specific pathogenic initiator of disease. Here bacteriology stood against hygienists like Gottstein, Hüppe, Martius, and Rosenbach amongst others. The bacteriologists put down the origin of infectious diseases

exclusively to known or unknown specific entities while rejecting all other causes, including the social. In contrast Gottstein especially, and then also Hüppe, Martius and others, emphasized the complexity of the aetiology. In their *Handbuch der Allgemeinen Pathologie* (Handbook of General Pathology),¹⁹ Uhle and Wagner have already said: “what we know of the conditions which cause internal diseases does not, for the most part, relate to causes as defined within the discipline of logic, in other words *causae sufficientes*, causes which always and alone produce the effect, but to complex conditions, under whose influence, sometimes frequently, sometimes rarely, diseases become manifest”.

The introduction then goes on to discuss an example developed by Friedrich Martius.

‘As an example, Martius used the detonation of an explosive powder set off by a spark. Here the cause of the blast is the latent energy of the powder which is converted into kinetic energy by the action of the explosion. The lay person, who understands nothing of latent energy, describes the spark as the cause of the explosion. Martius continues, “To avoid the same misunderstanding in scientific discussions once and for all, it is necessary to introduce linguistically different expressions for each different happening. While the cause of the extent of the effect is to be sought in the latent energy of the powder, one best describes the spark, which initiates the explosion, as the triggering factor.”²⁰ Bacteria are for certain infectious diseases a necessary factor, but certainly not a sufficient cause of disease!’

Table 1 Titles and authors of the 20 chapters included in *Krankheit und Soziale Lage*, edited by M Mosse and G Tugendreich

| Title of chapter | Author(s) |
|---|-------------------------|
| General | |
| Introduction | M Mosse & G Tugendreich |
| The basis of morbidity and mortality statistics | H Silbergleit |
| The social aetiology of diseases | |
| Housing and its influence on morbidity and mortality | E Wernicke |
| Nutrition and its influence on morbidity and mortality | F Hirschfeld |
| Employment and occupation and its influence on morbidity and mortality | F Koelsch |
| Social position and its influence on women’s morbidity and mortality | W Weinberg |
| Social position and its influence on children’s morbidity and mortality | G Tugendreich |
| Social position and its influence on fitness for school | M Fürst |
| Social position and its influence on military fitness | H Meisner |
| Social position and its influence on neurological and mental disease, suicide and criminality | G Voss |
| Social position and its influence on alcoholism | B Laquer |
| Social position and its influence on venereal disease | A Blaschko & W Fischer |
| Social position and its influence on infectious diseases | F Reiche |
| Social position and its influence on tuberculosis | M Mosse |
| Social position and its influence on the development of tumours | A Theilhaber |
| Social position and its influence on dental disease | F Williger |
| The social therapy of diseases | |
| The state’s struggle against social causes of disease | F Zahn & J Kleindinst |
| Tasks of municipal and private welfare | A Gottstein |
| Influence of social legislation on prevention, diagnosis and prognosis of disease | A Fischer |
| Social measures to improve selection in reproduction | W Schallmayer |

Tuberculosis

We have chosen the chapter on tuberculosis, which was written by Mosse himself, for more detailed consideration because tuberculosis was at this time a major source of morbidity and mortality, and because the studies and the discussion have relevance today in the light of the resurgence of the disease in industrialized nations.

The tuberculosis chapter follows the general pattern of other chapters by reviewing and discussing published studies. A total of 85 authors are referenced. Most had published in German-language journals but French, English and American authors are also included. The chapter begins,

'On the following pages we will attempt to critically portray the extent of the relations between social position and tuberculosis. First we will give an overview of the frequency of tuberculosis and then examine the influence of social circumstance. Furthermore the interrelationships between tuberculosis and those factors that constitute the concept of "social position" will be discussed, with special emphasis on the influence of occupation, housing and nutrition.' ref.1 p. 551

The chapter does not cover in detail the treatment of tuberculosis. A major study of tuberculosis sanatoria in Germany and England in this period has recently been published by Flurin Condrau.²¹

After a discussion of different types of tuberculosis and its prevalence in a variety of places, the chapter addresses the reasons for the decline in tuberculosis mortality.

'It may appear fair to assume that particularly for Germany the decline in the mortality from tuberculosis is attributable to the influence of those measures that have been implemented in Germany specifically to fight tuberculosis, including national insurance for workers, and the setting up of sanatoria whose numbers have increased annually. This connection has indeed been assumed by a large number of authors.

The example of England shows precisely that this assumption cannot be true because there is no state insurance for workers and the number of sanatoria is very small. In 1905

Philip M Blumenthal²² drew attention to the fact that neither the older hospital-based, nor the more recent sanatoria-based therapy for tuberculosis in England, could be the reason for the sharp decline in mortality from tuberculosis in England. Evidently another factor exists whose influence was much more powerful and decisive. This factor is represented by the massive and radical reform of public health, welfare and housing, as well as the continuous improvement in the economic position of workers.' ref.1 pp. 564-65

There is then extensive discussion of the relationship between tuberculosis and social factors. First the relationship between tuberculosis and income is discussed. Data for Hamburg are presented (reproduced in Table 2 and Figure 1) which show a decline in mortality with an increase in income. These data were first published in the Catalogue of the Statistics Group produced for the International Hygiene Exhibition at Dresden in 1911.

Data on mortality and income (or wealth) are also given for the cities of Breslau, Paris, Bremen and Vienna.

'S Rosenfeld²³ found that mortality from tuberculosis of the lung steadily declined in all districts of Vienna from observation period to observation period from the year 1881, but proportionally to a much greater degree in the affluent districts which had a lower mortality from the start than in the poor districts. The largest proportional declines were observed in the poorer districts early on but later on in the prosperous districts. The decline in mortality affected the working class the least.' ref.1 p. 576

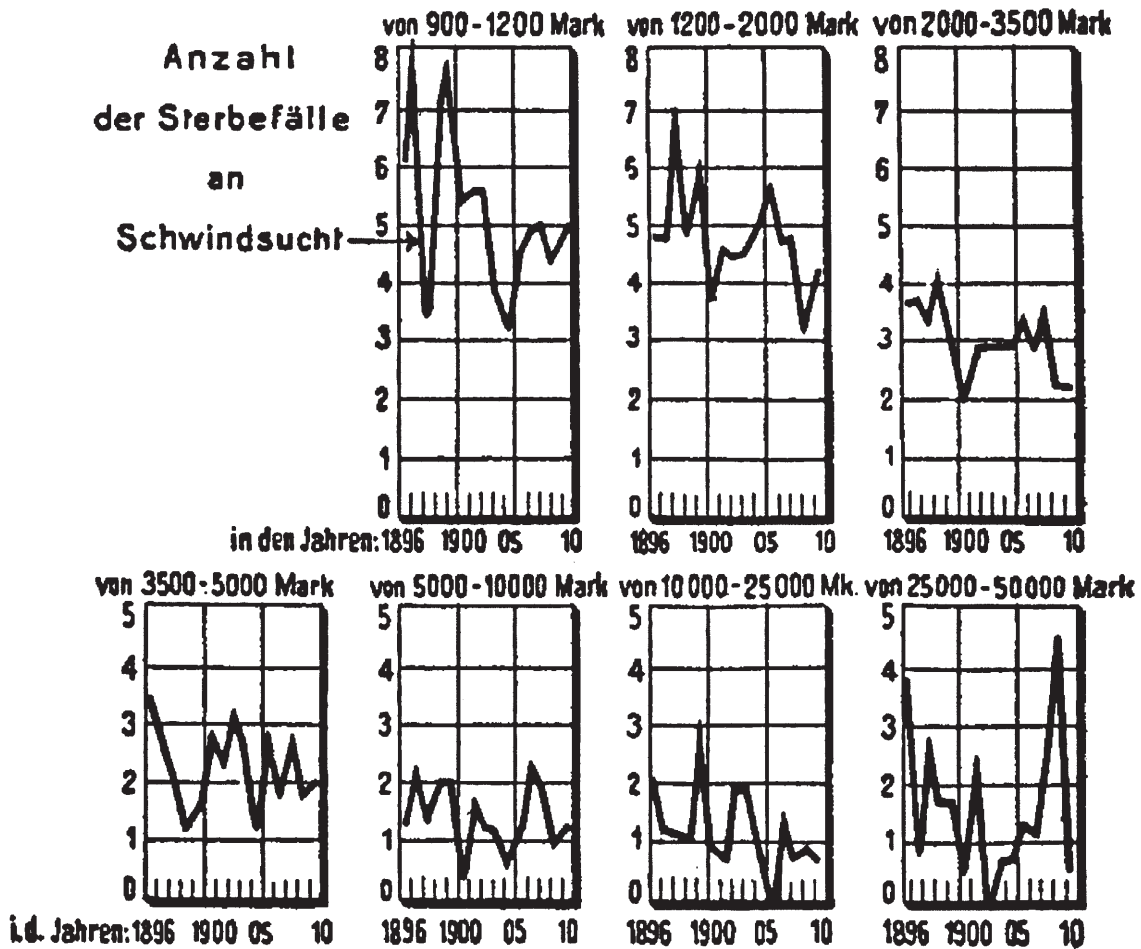
The authors were well aware of the problem of confounding between domestic and occupational exposures, a problem that plagues epidemiology to this day.

'If we then turn to observing the influence, in isolation, of housing, nutrition and occupation on the standing of tuberculosis, first of all it must be again remembered that the effect of these individual factors is often difficult to separate from each other, and that an accumulation of effects takes place in most cases.' ref.1 p. 578

Table 2 Income (Einkommen) and mortality from tuberculosis (per 1000 inhabitants), city of Hamburg 1905-1910. Income is given in Marks (M)

| Einkommen | 1905 | 1906 | 1907 | 1908 | 1909 | 1910 |
|-------------------|------|------|------|------|------|------|
| von 900— 1200 M. | 3,36 | 4,54 | 4,98 | 5,08 | 4,45 | 5,09 |
| über 1200— 2000 " | 5,06 | 5,72 | 4,78 | 4,80 | 8,27 | 4,25 |
| " 2000— 3500 " | 2,94 | 3,45 | 2,91 | 8,64 | 2,24 | 2,27 |
| " 3500— 5000 " | 1,82 | 2,88 | 1,99 | 2,81 | 1,77 | 2,08 |
| " 5000—10000 " | 0,77 | 1,24 | 2,40 | 1,96 | 1,00 | 1,26 |
| " 10000—25000 " | 0,95 | — | 1,63 | 0,82 | 0,97 | 0,74 |
| " 25000—50000 " | 0,71 | 1,84 | 1,25 | 2,41 | 4,57 | 0,55 |
| " 50000 M. | 2,10 | — | — | 1,60 | 2,29 | — |

Einfluss der Wohlhabenheit auf die Häufigkeit der Tuberkulose auf Grund der Erhebung über die Einkommensverhältnisse der Gestorbenen in der Stadt Hamburg seit 1896.



[Aus dem Katalog der Gruppe Statistik der Internat. Hygiene-Ausstellung Dresden 1911.]

Figure 1 Mortality (number of deaths per 1000) from tuberculosis by income strata, city of Hamburg 1896–1910. Income is given in Marks

Amongst a number of examples of the link between housing conditions and tuberculosis mortality, there are the striking data from a study by Marié-Davy which compared, by Paris arrondissement, tuberculosis mortality and the average number of windows per person.²⁴ The data are reproduced in Table 3 and presented graphically in Figure 2.

The relationship with nutrition is then considered.

‘We must remind ourselves of the so-called Engel’s law [Ernst Engel, a statistician] which was established in 1857 and says that “the smaller the household budget the larger the proportion spent on food”. Franz Eulenburg expressed the same law as follows “the smaller the income the

more important the price of food becomes for nutrition.”²⁵ This author quotes the results of the economic analyses of 852 poor families, as surveyed by the Imperial Statistical Office (WR), of 320 households of metal workers, assessed by the German Union of Metal Workers (MA), of 285 households from Hamburg, calculated by the local statistical bureau (HR) and of foreign studies in the following table.’ ref.1 p. 581

The data are reproduced in Table 4. There is then an extensive discussion of the influence of occupation on tuberculosis. This is followed by consideration of links between tuberculosis mortality and alcoholism, altitude above sea level at which people

Table 3 Average deaths per 1000 inhabitants by arrondissement (A) and number of windows per inhabitant by arrondissement (B), Paris 1858–1902

| A. Décès pour 1000 hab. moy. 1858–1902 | | | | | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1,3 | 2,2 | 2,3 | 2,9 | 3,1 | 3,3 | 3,3 | 3,9 | 3,9 | 4,0 | 4,9 | 5,1 | 5,5 | 5,5 | 5,6 | 5,7 | 6,1 | 6,6 | 6,6 | 8,2 |
| B. Fenêtres par arrondissement. | | | | | | | | | | | | | | | | | | | |
| 4,2 | 3,7 | 3,5 | 2,6 | 3,0 | 2,6 | 2,5 | 3,5 | 2,5 | 2,4 | 2,1 | 1,5 | 1,7 | 2,0 | 1,7 | 2,0 | 1,6 | 1,5 | 1,7 | 1,8 |

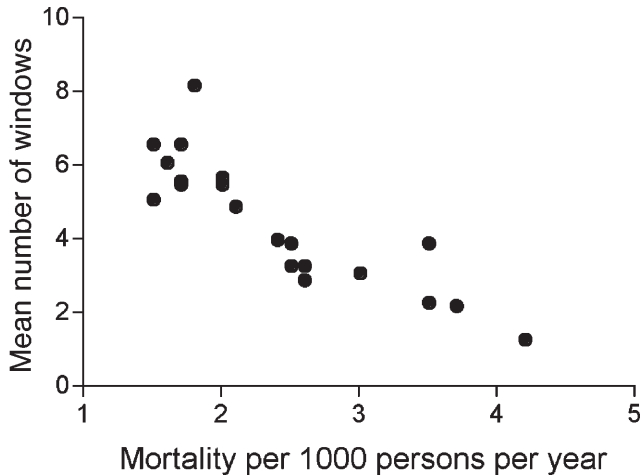


Figure 2 Association between the mean number of windows per person and mortality from tuberculosis in 20 arrondissements of Paris, 1858–1902. The Pearson correlation coefficient is -0.86 , $P < 0.0001$ (our calculation)

live, and variations in mortality between religious and ethnic groups. The chapter ends with,

‘I end this chapter by pointing to the English experience, which (as I have already stressed earlier) demonstrates and teaches that tuberculosis is a question of nourishment and housing, and that all suitable measures which lead to a reduction in the price of food and an improvement in housing conditions must be pursued by us most extensively.’ ref.1 p. 603

Eugenics

The majority of practitioners of social medicine at this time believed that eugenics had a part to play in improving public

health. The final chapter, on ‘Social measures to improve selection in reproduction’, was written by Wilhelm Schallmayer, an early eugenic theorist.^{ref.7 pp. 85–86} He asserts that the influence of genetic factors on public health must be considered as well as the impact of social conditions. The chapter discusses the many state laws in the US prohibiting marriage for those with conditions such as mental illness, epilepsy, ‘feeble-mindedness’ and alcoholism, as well as the smaller number of examples of sterilization laws in the US and other countries. This review of policies of negative eugenics is followed by proposals for positive eugenics where the intention is to improve the fertility of those people considered to be the most talented. One example is the suggestion that the ban on marriage for female teachers should be lifted in the hope that they would be able to start having children earlier, and would eventually have more children. It is also suggested that a eugenic record be created for everyone in the population.

However the balance of material within the book, with only one chapter and part of the introduction dedicated to eugenics, indicates the relative degree of importance given to eugenics in comparison to social factors by Mosse and Tugendreich. In the introduction they argue against those who believed that welfare would lead to degeneration of the population by interfering with the operation of natural selection.

‘But it cannot be a surprise that warnings and admonitions are made by those who do not tire of pointing out the disadvantages of welfare. The Darwinian teaching of the selective effect of natural competition is an especially important argument. These critics say that social welfare, whose task it is to preserve the lives of the weak and sick, in a way falsifies the natural process of selection. In these circles a decline, a decay of the population and the race is predicted. Against this it must be said with all clarity, that selection created by social circumstance is, on no view, comparable to the selective

Table 4 Relationship between income and expenditure on food. Percentages of total income spent on food from five sources are shown: Survey of Imperial Statistical Office (WR), German Union of Metal Workers (MA), Hamburg Statistical Bureau (HR), American workers, French teachers

Anteil der Nahrungsmittel an den Gesamtkosten in Prozent

| Bei einem Einkommen von Mark | WR 1 | MA 2 | HR 3 | Amerik. Arbeiter 4 | Französ. Lehrer 5 |
|------------------------------|---------|---------|---------|-----------------------|----------------------|
| bis 1200 | 54,2 | 55,9 | — | 52,3 | 54 |
| 1200—1600 | 54,6 | 55,9 | 51,1 | 48,1 | 53 |
| 1600—2000 | 51,0 | 53,2 | 51,0 | 46,9 | 51 |
| 2000—2500 | 48,1 | 52,0 | 48,0 | 46,2 | 46 |
| 2500—3000 | 42,7 | 53,4 | 45,6 | 43,5 | 42 |
| 3000—4000 | 38,1 | | 43,0 | 40,1 | |
| 4000—5000 | 32,8 | 33,5 | 33,5 | 37,7 | |
| über 5000 | 30,3 | | | 36,4 | |
| Durchschnitt | 45,5 | 53,4 | 45,2 | 43,1 | |

effect of natural influences. The actual health status of a person is the result of the influence on the environment and the response of the body. This response is defined through a variety of factors which one usually characterises as constitution. This constitution is not fixed at birth; much more it develops at least until the end of puberty. It is again the result of inherited and acquired characteristics. In no way is social need a selective effect in the same sense that those who have inferior hereditary factors are the victim of them and those with favourable factors continue successfully. The unnaturalness of the social struggle for survival shows itself precisely in the fact that even people with healthy constitutions fall victim in droves ... The great majority of all people are born healthy; the newborn of the working class are not differentiated from those of the rich and just as little is the working class baby different as long as it enjoys natural food from the mother's breast. The differentiation begins with the moment when culture begins its influence, in our case, at the moment when the baby takes processed food. ^{ref.1 pp. 19–20}

Eugenic ideas were common, and were part of a progressive or left-wing outlook, in many countries in northern Europe and North America in the period before and after the First World War. The ideological affinity between eugenics and the left has been discussed by Michael Freedman²⁶ and Diane Paul²⁷ in studies of ideas current in Britain between the wars. They have shown that many socialists believed that the state should influence reproduction in order to improve the physical and mental characteristics of the population as part of a general programme to improve society. There was a wide variety of eugenic ideas, and left-wing eugenicists were usually, but not always, opposed to the more extreme proposals such as compulsory sterilization, but there were few socialists who rejected eugenics completely. Those who did reject eugenics were a mixture of individualists, liberals and conservatives.²⁷ It is therefore not surprising that many practitioners of social medicine in Germany before the First World War included eugenic ideas in their overall vision for improving public health.

It was the actions of the Nazis which, understandably, led to eugenics being seen as a ghastly aspect of extreme right-wing ideology and this view has predominated since the Second World War. One consequence is that there has been a focus on the eugenic component of social medicine in the German-speaking countries before the First World War and a tendency to overlook the studies of the relationship between social conditions and ill health. For example Alfred Grotjahn, the first professor of social medicine in Germany, has sometimes been unfairly dismissed as a social hygiene propagandist for racist and eugenicist proposals.²⁸

It is difficult to argue convincingly that the mainstream eugenic views current in Germany before the First World War would lead inevitably to the gas chambers of the Third Reich because these views were common in northern Europe and North America. In his immense work on health, race and German politics Paul Weindling says,

'My interpretation stresses that eugenics was authoritarian in that it offered the state and professions unlimited powers to eradicate disease and improve the health of future generations. But it was neither a product of the theory of a superior

Aryan race, and nor was it inherently Nazi. The synthesis between Nazism and eugenics was a process of adaptation and appropriation on both sides.' ^{ref.7 p. 7}

Conclusion

As a product of the pioneering social medicine movement in the period before the First World War, whose centre was in Germany, Mosse and Tugendreich's *Krankheit und Soziale Lage* is a remarkable book because its enormous scope and depth of detail clearly demonstrate the huge amount of research being done into the social causes of ill health in this period in Germany. The books by Walther Ewald, Alfons Fischer and Alfred Grotjahn^{11–13} also show the breadth of work being done but, arguably, none match that of Mosse and Tugendreich.

It is striking that in recent years some of the themes in Mosse and Tugendreich have been resurrected and enthusiastically debated once again. For example, the argument is made in Mosse and Tugendreich that medical interventions are often less effective than is generally assumed, and that environmental and social factors can be more important determinants of mortality. The example is given of the establishment of special hospital wards and sanatoria to treat tuberculosis which were less effective in reducing mortality than the establishment of a welfare system, improvements in housing and higher wages. This proposition was not forcefully made again, in a way which generated extensive discussion, until 1979 when Thomas McKeown published *The Role of Medicine*.²⁹ In the intervening years the notion that the decline in mortality was mainly due to advances in medicine became the predominant view particularly amongst the medical profession and the general public.

Similarly, throughout the book, much emphasis is given to exposures early in life. Mosse and Tugendreich argued that constitution is not fixed at birth but develops 'at least until the end of puberty', thus adopting what we would now describe as a life course approach.³⁰ Others in Germany and elsewhere argued that constitution was entirely determined by genetic factors, and the eugenicist and statistician Pearson was one who argued on this basis that interfering with natural selection would lead to a British race of 'degenerate and feeble stock'.³¹ The life course model has gained acceptance in recent years as it became clear that the prevailing aetiological model, which emphasizes adult lifestyle factors, is unable to explain adequately social and geographical variations in chronic disease risk.

Mosse and Tugendreich's discussion of the influence of social circumstances on health is as relevant today as it was in 1913. *Krankheit und Soziale Lage* deserves a secure place in the history of social medicine and epidemiology.

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at the University of Bristol is the leading centre for the Medical Research Council's Health Services Research Collaboration.

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