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FRESH ALARMS ON THE
INCREASE OF CANCER

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FRESH ALARMS ON THE INCREASE OF CANCER.

STATEMENTS emanating from the United States have recently been made public alleging an alarming increase of cancer.¹ Mr. F. L. Hoffmann, who is responsible for these statements,² takes the stand that it is absolutely incredible that the figures he gives—namely, a cancer death-rate of 63 per 100,000 of population in 1900 and of 74·3 in 1911 *for the United States* and for the large cities of 37·2 per 100,000 of population for the five years ending with 1876, and of 80·5 for the five years ending with 1911—do not represent an actual enormous increase, and he deplors the waste of time spent in questioning an undoubted increase.

In endeavouring to appreciate what importance should be attached to these statements it is necessary to call to mind the history of vital statistics in that country, and also their very backward condition at the present day. From 1850 to 1900 the endeavour was made to collect figures of deaths through the enumerators as part of each decennial general census of population of the United States. This attempt at centralisation was doomed to failure because only immediate registration can be effective, and the method was abandoned in 1910. Centralisation of the recording of births, deaths, and marriages has not yet been effected in the United States, and recourse must be had to the reports of the several States. These are of very unequal value, and, indeed, are often nearly valueless.

¹ THE LANCET, Jan. 3rd, 1914, p. 47; The Times, Jan. 20th, 1914.

² Frederick L. Hoffmann: The Menace of Cancer, Transactions of the American Gynaecological Society, 1913. Clinical Congress of Surgeons of North America, Chicago, 1913.

In 1880 the compulsory registration of deaths, as enforced by municipal or State authority, was first introduced at Massachusetts, New Jersey, the district of Columbia, and for some cities where State control did not obtain. Even to-day there is no registration law at all, or, if so, it has only recently been placed on the Statute Book in many States like Alabama, Georgia, Illinois, and South Carolina. The statistics available for Pennsylvania were utterly valueless up to 1906, as were those for Ohio up to 1909, and those for Missouri and Kentucky up to 1911. Several of those named are Eastern States. The Southern States are still entirely without any sort of reliable registration.

At the present time only 22 of the Eastern, Northern, and Western States make any claim whatsoever to enforce the registration of deaths, and in many of these the law is most imperfectly carried out. For New York City itself Oertel³ has shown that the greatest laxity and inaccuracy obtains, owing to the negligence of the medical profession and the unwillingness of the authorities to enforce the prescribed penalties. In addition, the attempt is made by 38 municipalities, and by those towns of North Carolina with populations of 1000 and upwards, and by the District of Columbia. Thus from 8,538,266 in 1880 the numbers under registration law have been raised to 59,275,977 in 1911. In other words, while imperfect registration of deaths covered only 17 per cent. of the population of the United States in the year 1880, 31.4 in 1890, and 37.9 in 1900, 63 per cent. are so affected to-day. This is a great improvement in the registration of deaths, but 37 per cent. of the population still remains without even imperfect registration of the causes of death.

By 1900 only 11 States were Registration States. Moreover, prior to 1902 no two States and scarcely any towns used precisely the same methods of certifying deaths. In that year the "standard" certificate was introduced. As revised by Act of Congress in April, 1913, it is now being approved or used in most States of the Union,

³ Oertel: American Underwriter, May, 1913.

including Alaska, except Alabama, Georgia, Illinois, New Hampshire, New Mexico, Rhode Island, South Carolina, and West Virginia. It is evident that no comparison is possible between one year and another *for the United States*, or even between different States.

It must be added emphatically that even the States longest under the "compulsory" registration law—e.g., Connecticut and Massachusetts—have not yet succeeded in enforcing registration of all births. The total population of the United States at the Census of 1910 was 90,753,277. For 1911 the aggregate estimated population of the registration area of the United States was 59,275,977, among whom there were 839,284 deaths recorded. In England and Wales for the same year a population of 36,163,833 yielded 527,810 deaths. For the same year the births and the infantile mortality in *the registration area of the United States* cannot be estimated with any approach to accuracy, but in England and Wales the births numbered 881,138—i.e., more than seven and a half times the deaths of infants under 1 year (114,600). Thus the United States present a marked contrast. No State has complete registration of births. In 1911 in 11 States only did the births exceed the number of children returned as aged 1 year or under. In 1911 in only two States did the births registered equal the number of infants, and only in three States did the births exceed the figures for infants by the small margin of 10 per cent.⁴ The discrepancies in the above figures of births and deaths in relation to population for the United States, as compared with England and Wales, are to be explained largely by the considerations set forth with reference to the imperfect registration of births and deaths; they signify hundreds of thousands of unpunished offences against the registration laws of the United States in one year. The offences against the Registration Acts in England and Wales amounted in the same year to the small total of 19, all of the offenders being prosecuted and convicted.

These facts are of themselves a sufficient com-

⁴ Exclusive of cities of a population of 500,000.

mentary on the very imperfect extent to which births and deaths are registered in the United States. It is a matter of common knowledge how high infantile mortality is, and how it must be taken account of in accurate statements of the total mortality of a population. It is also common knowledge that the age constitution of a population is determined by the birth-rate, if immigration and migration be left out of account, and that the age constitution of a population has an important relation to the death-rate. The birth-rate itself affects the death-rate only according as it alters the age constitution. While such inaccuracies obtain for the two chief events in life—birth and death—the age constitution of the United States is simply unknown, and the question arises, Is it to be entertained as possible that subsidiary events, such as the occurrence of cancer, are likely to be stated with greater accuracy? Even when the physician certifies the cause of death he is asked to supervise *voluntarily* the statements made by the layman as to such important matters as *age, sex, colour, marriage, occupation, birthplace of father and mother, and duration of residence*. Voluntary certification has invariably broken down; the physician devotes all his attention to his compulsory duty when filling in a death certificate, and he will not bother about requests that he should volunteer to give information as to other details relating to the deceased. Sex and age are most important in regard to all causes of death, but they have a unique importance in the case of cancer.

The inference to be drawn from a study of the confused state of affairs in the United States is that improvements are being effected in the collection of vital statistics of that country, as the result of the praiseworthy efforts of the Census Bureau in Washington, under the initiative of Cressy L. Wilbur. Nevertheless, statements of the causes of death are still only possible per 100,000 of population, no account being taken of age and sex. The imperfect registration of births and deaths makes this method, recognised as crude under the best circumstances, even of less value. For example, absence of accurate enumeration of the

number of births makes it impossible to estimate the proportion of males and females, or even of all children dying under the age of one year. This of itself invalidates any comparison per 100,000 of population, and greatly influences the still more erroneous figures published for some States for which the deaths from cancer are stated as percentages of total deaths, or as "rates" per 1000 deaths from all sources.

Mr. Hoffmann states: "The cancer death-rates in the registration States, for which the data are as trustworthy as for any European country, was 72.1 per 100,000 of population for the year ending 1909."⁵ Since the age and sex constitution of the population is unknown this claim cannot be upheld. A table setting forth the "mortality from cancer for the United States (Registration States) per 100,000 of population and sex" has an appearance of accuracy which cannot be attained owing to the inadequacy of the primary data. As is well known, under 5 and over 55 the general death-rate is higher than the combined death-rate for all ages or for any intermediate age periods. The proportion of the population living at different age-groups differs greatly in different areas, and therefore the relative numbers at the two extremes of age which are subject to the highest death-rates will vary correspondingly and the relative total death-rates for all ages will vary. Hence when particular States are selected and special death-rates for cancer are stated for each sex, for age-groups above 30 or 40 and for particular sites, the figures are equally valueless because the age and sex constitution of the population is unknown owing to the imperfections of registration. As a matter of fact, "after most carefully re-examining the entire statistical material for the civilised world," Mr. Hoffmann should have become aware that European countries show as wide variations in their figures of population and of deaths from cancer as do the States of the Union. This is a point frequently emphasised as indicating only the stage to which their several vital statistics have developed.

⁵ The Menace of Cancer, p. 8.

Consideration of the preceding remarks on the position of vital statistics in the United States shows that an accurate method simply cannot be adopted for the United States as a whole or even for one or two States, if indeed for any single State. It is not attempted for one out of the oldest registration States—viz., Connecticut,⁶ for which State in the Report for 1910 the deaths from cancer are lumped together with the whole group of "general diseases" of the International Nomenclature—i.e., not only with the infective fevers, but also tuberculosis, syphilis, gonorrhœa, &c., and then all these deaths are stated as a percentage of the total deaths from all causes. For Rhode Island the deaths from cancer are stated for the months and quarters of the year as a percentage of all causes of death and per 1000 of population in the Report for 1909.

The only advance attempted from this most fallacious of methods is to statements per 100,000 of population. The annual report of the Department of Health for New York City (1909) baldly states: "The mortality from cancer and sarcoma has increased at an enormous pace; in the decennium 1868-1877 the number of deaths reported was 5556 and the rate 39 per 100,000, and in that of 1898-1907 the deaths numbered 23,648 and the rate reached the high figure of 67 per 100,000, an increase of 72 per cent. in the rate." In England and Wales the corresponding crude figures are 98 per 100,000 of population; and the discrepancy simply means that the most cancer-ridden areas of the United States have all the leeway implied to make up in the collection of data. Similarly the thirty-fourth annual report (1910) of the Board of Health of the State of New Jersey, which with Massachusetts was the first to introduce "compulsory" registration in 1880, gives two tables, one stating the deaths per 10,000 of population as rising from 3.70 in 1879 to 7.07 in 1909. The other table gives merely the total number of deaths at several age periods from 1901 to 1909. The height of absurdity of this way of stating death-rates is reached in the case of the District of Columbia, which, it will be remembered,

⁶ The report of Massachusetts is not accessible to me.

is that small neutral area within which Washington, the capital of the United States, is situated. In the report of the health officer for 1910 one column gives the deaths from malignant growths per 100,000 of population, and the adjacent column the death-rates from measles per 100,000 of population. Here the extremes of life meet on an equal footing with a vengeance!

It is needless to multiply instances, since sufficient has been said to make it remarkable that Mr. Hoffmann has nowhere made any reference to the unsatisfactory state of the collection of the data upon which the vital statistics of the United States are based, as described above, and nowhere refers to the statistical fallacies laid bare in this paper. It is even more remarkable that there is no reference to the straightforward confession made by the distinguished Director of the Census Bureau in Washington of the inaccuracies inherent in the primary data as collected by the several States. Nevertheless, Mr. Hoffmann says categorically: "After most carefully re-examining into practically the entire statistical material for the civilised world, I am absolutely convinced that the cancer death-rate is increasing, and that the recorded mortality is not primarily due to improved medical diagnosis and more accurate methods of death certification."

The facts related regarding the improvements effected in the registration of deaths and births for the United States and their present imperfections, as well as the fact that 37 per cent. of the entire population is still under no registration law at all, sufficiently demonstrate the influence "more accurate methods of death certification" must have exerted since 1876, since 1880, since 1902, or even since April, 1913, these years marking important developments. Mr. Hoffmann himself claims that the greatest increase has been during the last ten years. Although this is too short a period to admit of his far-reaching conclusions, it may be pointed out that the proportion of the population of the United States under registration law rose from 37.4 to 63.1 during this decade.

As regards "improved medical diagnosis," one can hardly conceive that even under the difficult

circumstances⁷ obtaining in the United States more accurate certification has not been promoted by the development of more accurate methods of registering deaths in the United States, as well as by the many other factors recognised and allowed for in the statistics of European States.

In view of the circumstances pertaining to the collection of the elementary data of vital statistics emphasis must again be laid on the probability that, when speaking of so obscure a disease as cancer and of such difficult problems as are involved in its statistical study, Mr. Hoffmann is quite unjustified in claiming that the cancer death-rates in the registration area of the United States are based upon data as trustworthy as for any European country. The primary data of population will not stand comparison with the corresponding data on which the English vital statistics are based. Still less will the cancer statistics of the United States, or of any single State, stand a comparison with the corresponding special English statistics, and the same applies to other European countries.

There are many other matters to which exception may be taken in the papers under consideration—notably the complaint that the collection of figures of deaths at the decennial census of the United States has been abandoned, reliance on the valueless cancer census in Germany and Hungary, and on the alleged low cancer death-rate for Ceylon, “since the vital statistics for this island are generally accepted as entitled to confidence.” No allowance is made for immigration or migration, both of which may radically affect the age constitution of the United States as a whole, and that of the several States.

It is to be regretted that one who, in virtue of his office as statistician of the Prudential Insurance Company of America, wields so much authority on statistical matters in the United States, should have been so incautious in his statements alike of facts and in the deductions drawn from unreliable data,

⁷ For example, Oertel has pointed out with great emphasis the rarity with which necropsies are performed—necropsies may add as much as 40 per cent. to the cancers diagnosed in internal organs; the difficulties associated with immigration and floating population also may be mentioned.

while at the same time neglecting all the limitations to which his figures are subject.

It is not the present purpose to discuss again the question of the real or apparent increase of cancer, but only to show the inadequate basis upon which alarm has been again raised in America and communicated to the public of this country. Nevertheless, the analysis of deaths from cancer for England and Wales, in which due regard is paid to age, sex, and site distribution of the disease, has completely demonstrated that it is wrong to speak of an increase of cancer as a whole. While admitting discussion of the real or apparent increase for certain parts of the body—since the unintentional experiments of native races alter entirely the relative anatomical distribution of cancer as known for Europeans—these statistics clearly demonstrate that for other parts no increase has taken place. The position taken up by King and Newsholme in 1893 has been amply justified, that the increase is mainly in parts of the body inaccessible to complete examination, as has also the development of the views of these authors as set forth in the reports of the Imperial Cancer Research Fund.

While other countries have been discussing the "increase" of cancer during the past 12 years on the old imperfect primary data, by means of antiquated statistical methods in which all cases of cancer are lumped together, and no allowance is made for sex and age constitution, or have been endeavouring to circumvent the handicaps thus imposed by means of fallacious voluntary or compulsory cancer censuses, the General Register Office in this country has been carefully tabulating year by year more elaborate and more accurate primary data. The new and very important deductions thus made possible are set forth in the recent reports of the Registrar-General for Births, Deaths, and Marriages. The biological (etiological) significance of some of these improvements was foreshadowed in 1905 in the Second Scientific Report of the Imperial Cancer Research Fund. The results attained have also been commented on in the more recent reports of this Fund.

To sum up, the statements of an alarming

increase of cancer in America have only the value of vague rumours; they are based on figures and not on statistics. The harm these rumours of high mortality may do it is not possible to define. It is hoped, however, they will at least serve to awaken the American people to the necessity for enforcing the registration laws if the alarm awakened is to be allayed, future alarms avoided, and if they are to obtain the many practical benefits which accrue from accurate vital statistics as opposed to the sanitary and financial losses which their absence inevitably entails. This will be the work of years, and meantime discussion of the real or apparent increase of cancer in America lags at least 20 years behind the times, and ought not to disturb the equanimity of anyone.

To take up this attitude is not to detract in any way from the grave importance of cancer as a cause of death. Nor is it to assert that were all the facts known cancer would be found to be uniformly prevalent in all countries and in all decades. Differences in prevalence of certain forms of cancer do occur in widely separated parts of the globe; whether such occur in more restricted areas can only be determined by accurately registering the several sites attacked.