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Gershom H. Hill

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THE IMPORTANCE OF VITAL STATISTICS IN THE STUDY OF SOCIAL SCIENCE.

BY GERSHOM H. HILL, M. D.

Social science is now studied in all colleges and universities. Professors who have qualified themselves by years of post graduate work both at home and abroad show pupils how to study history in a topical manner. Statistics, ancient and modern, are compared. Large and well stocked libraries are in demand. Public documents, reports of State institutions, both charitable and penal, are examined. The data desired are compiled and used. Inter-society and inter-collegiate debates, upon popular questions, are frequently held. The most learned men available are asked to be present and serve as judges. In the study of science, theories are admissible only when facts can not possibly be obtained. In the study of social science, statistics are indispensable. In order that they may be of greatest value they must be gathered and reported by discriminating and unbiased minds, at the same time they should be complete and accurate. Guess work and prejudice vitiate statistics. In addition to more than a dozen State institutions in Iowa, we have a State association of charities and correction. The work of looking after the poor and the otherwise unfortunate part of the population in the larger cities is now thoroughly organized; existing conditions are investigated, and discretion is exercised in giving relief. Suitable homes are provided for orphans, for the aged, and for the "boys in blue." The largest cities in this country, as well as many

others, have excellent hospitals, almost innumerable, and general hospitals are now being established by the Catholic and other churches in Iowa. Even in towns of but a few thousand inhabitants there are private hospitals owned by the surgeon in charge. Now, not only students, professors in colleges, clergymen, and various philanthropists, are studying sociology, but in Iowa the members of the Board of Control of State Institutions, the superintendents, and wardens in these institutions, the secretary of city charities, and the general secretary of the Y. M. C. A., learn by experience that "prevention is better than cure." Co-operation is practiced, and all persons engaged in this kind of work are anxious to learn the causes of poverty, intemperance, prostitution, crime, suicide, insanity, other diseases, and degeneration. In this manner the generous public, which has the burden of supporting these various institutions, will learn how to prevent misfortune, and how to reduce the number of its dependent class to a minimum. For an example, the question is often asked, "Is insanity increasing in our state?" In order to secure intelligent and trustworthy information on this subject, we must turn to the hospitals for the insane. In these hospitals careful attention is given to statistics. Here this disease is being studied in a thorough and scientific manner. Here we can learn to what extent the insane are foreign born, or the children of foreigners. Also to what extent heredity is the cause of this disease, and whether either parent of a patient was intemperate, or vicious, or degenerate. Again we look to the hospital to inform us to what extent education and religion are factors of producing, or in preventing insanity. What occupations were the insane engaged in? Are the single or married more likely to become insane? Is city life or country life more conducive to insanity? Should harmless and incurable insane persons be permitted to live at home, or all of them, always be cared for in state, in county, or in private institutions? In order to make the statistics concerning unfortunates most valuable, the enumeration of the population outside of the institu-

tions should be thoroughly taken, so that reliable comparisons can be made and correct conclusions drawn. Statistics have been used ever since there were states; first by the government to number the fighting men, next to ascertain what amount of taxes should be levied on the remainder of the population. Statistics, or rather the material for statistics, existed at a very early period, but it was not until within the last three centuries that statistic use of the information available began to be made for purposes of investigation, and not for administration only. What we now call vital statistics was first known as "political arithmetic," and began to be used in England about the middle of the seventeenth century. Statistics is defined as a collection of facts, tabulated and classified, respecting the condition of society in city, in state, or in the country. *Vital* statistics pertain to health, disease and mortality.

MARRIAGES.

I have in my possession the Sixty-fourth Annual Report of the Registrar-General of births, deaths, and marriages in England and Wales for the year 1901. I learn from this volume, of more than 300 closely printed pages, that the number of marriages during that year was 259,400, corresponding to a rate of 16 married persons per 1,000 of the estimated population. This rate was slightly below the average for the past 40 years. What seems most remarkable is the uniformity of rate during all these years. The slight decrease of the rates for 1900 and 1901 was probably due in some measure to the war in South Africa.

In accordance with the marriage act of 1898, which provides that under specified conditions, marriages may be solemnized in registered buildings by certain duly authorized persons without the attendance of a Register of Marriages, there are 25,000 certified places of worship. There are more than 15,000 churches or chapels of the Established Church in which marriages may legally be solemnized. There are also more than 13,000 buildings registered for the solemnization of marriages by rites other than

those of the Established Church. The denominations to which these buildings belong are Methodists, Congregationalists, Baptists, Catholics, and Jews. The registered buildings which had been supplied with marriage register books were distributed among 426 registration districts. There remained 210 registration districts within which *no* register building had been brought under the operation of the new law. The *forms* of marriage in England and Wales during that year, were 666 per 1,000 solemnization according to the rites of the Established Church, and 334 per 1,000 were contracted otherwise. Of the *men* who married during the year, 903 per 1,000 were bachelors, and 97 were widowers. Of the *women* 928 were spinsters and 72 were widows.

Ages at Marriage. The proportion of re-marriages has decreased year by year since 1876. Among the persons who married in 1901, 50 per 1,000 of the husbands and 160 per 1,000 of the wives were minors. During recent years there has been a decline in the proportion of marriages of persons under age. Of the over 500,000 persons who married in 1901 only 1 per cent of each sex failed to make definite statement as to age. As recently as the year 1881 precise statements of age were made in only about 5-6 of the marriages. The mean ages at marriage deduced from such imperfect data could only be regarded as rough approximations to the true mean ages of all who married. As the proportion of stated ages has increased the approximation has been brought closer. In the case of marriages between bachelors and spinsters the difference between the means of the recorded ages and the means of all the ages both of husbands and wives can not possibly exceed a small fraction of a year. In cases, however, in which one or both of the parties have been previously married the greater proportion of unstated ages leaves room for a much greater possible error. The *mean age* of those who get married now in England is greatly increasing. At present it is $26\frac{1}{2}$ years for bachelors, and 25 for spinsters.

Signatures in Marriage Register. The marriage registers show a further reduction in the signatures by mark, both

of bridegrooms and of brides. The proportion of illiterate men formerly was 194 per 1,000 marriages. It has fallen until it is now only 25 per 1,000. The proportion of illiterate women was formerly 268, it is now only 29. In 1901, in only 8 per 1,000 of the marriages did both bride and bridegroom sign by marks. In 17 other cases only the bridegroom signed by mark, and in 21, only the bride signed by mark. Quite a proportion of the marriages among illiterate persons were traced to foreign born Jews. Among the whole number of persons who married in the year 1901, 416 are described in the Marriage Register as having been previously divorced. I also have for reference the sixty-first Report of births, marriages and deaths in Massachusetts, for the year 1902. It is a paper bound volume of 250 pages and prepared by the Secretary of the Commonwealth. In Massachusetts in 1902 the number of marriages registered was 25,685 which was 794 more than the number registered in 1901 and 1343 more than the number of 1900 and was greater than in any of the previous years since the beginning of registration. The number of persons married for each 1,000 of estimated population was 18. In England it is 16. The highest proportion of marriages in the last 50 years occurred in the year 1854 when 25 persons in every 1,000 of the population were married, and the lowest in 1878 when 15 persons in every 1,000 were married. The average for 50 years is 19. In Massachusetts 30 per cent of the marriages occurred in the last quarter of the calendar year, which contains the holidays. 29 per cent in the second quarter consisting of April, May and June. In the third quarter which contains the hottest weather only 23 per cent of the marriages took place, and in the first quarter of the year, characterized by the coldest weather, only 18 per cent of the marriages are consummated.

In the study of marriages, like insanity, statistics ought to tell whether marriages are increasing or decreasing; whether city or country people are more likely to marry; whether persons who marry now are not older than those

who married 50 years ago. In the study of certain phases of social science it would be desirable to learn how the tendency to marry in Iowa compares with other states and with other countries; to what extent men and women marry three, four or five times. Again in the study of social science in this country it is desirable to know whether natives or foreign born persons are more likely to get married, and to what extent the blood of Yankees and foreign born people is getting mixed. Whether marriage between whites and blacks is increasing, and whether by this method progress is likely to be made in solving the race problem. By referring again to the Massachusetts vital statistics we find the marriage rate of Massachusetts as compared with various foreign countries per 1,000 population as follows: Russia 91, Hungary 89, Massachusetts 87, Germany 85, Belgium 83, Austria 82, Spain 81, United Kingdom 80, Switzerland 77, France 76, Holland 76, Italy 74, Norway 72, Sweden 62. In my opinion if it were not for the large standing armies in foreign countries, which we do not have in the United States, the marriage rates would be greater abroad than they are in Massachusetts, or in most of the states in this country. It is to be remembered furthermore in this connection that the population in Boston, and in the manufacturing cities of Massachusetts is now made up to a very great extent of foreign born population and of the children of foreigners. The Massachusetts vital statistics report also contains a chapter and several tables concerning divorces applied for and granted. It appears that in the year 1902 the whole number of divorces granted was 1,480, which number is greater by 537 than the average during the last 20 years. Twenty per cent, about the usual number, were granted on the ground of adultery, 46 per cent, which is 1 per cent less than the average, was granted on the ground of desertion, 70 per cent of the divorces granted were on the complaint of the wife.

BIRTHS.

The number of births registered in Massachusetts in the year 1902 was 72,219. The rate was less than in any year since 1882. Fifty years ago the rate was 29 births to 1,000 of population, now it is 27. Doubtless economic conditions of the population has an influential effect on the number of births by increasing or decreasing the number of marriages, but to what extent it is difficult to determine. The birth rates for Massachusetts are compared with several foreign countries. Russia has the highest birth rate, and France has the lowest. The rate per 1,000 inhabitants is as follows: Russia 49, Hungary 29, Austria 37, Germany 35, Great Britain 29, Massachusetts 26, France 22. The percentage of native born children has decreased with considerable uniformity during the last 20 years, and it is also true if a longer period of years is taken into account. It is observable that the male births always predominate. This is a general rule and obtains in European countries as in the United States. The greater mortality among males more than offsets the numerical preponderance of births of the males and results in a tendency to an increase in number of females.

DEATHS.

The report contains a statement of the mortality of Massachusetts compared with that of the countries of Europe. It is to be noted that the death rate in Massachusetts is less than in any of the countries except Norway. The rate per 1,000 inhabitants was, Russia 32, Spain 29, Germany 22, France 20, Great Britain 18, Switzerland 17, Norway 16, Massachusetts 16. It is observable that while the death rates have decreased largely in cities they have not decreased in the same ratio in the rural districts of Massachusetts. The effect of the advances made in medical science and in sanitation, and in the preventive and restrictive measures enforced by the health authorities is much better illustrated by examining the comparative rate for registration cities in this country than by compar-

ing the rates of the whole state. The decrease in the general death rate due to disease most frequent in the early years of life, on the one hand, and in the increase in the rates due to this disease occurring generally in advanced ages, on the other, mean also increased longevity. Physicians in studying vital statistics are more interested in the causes of death than anything else. Now the causes of death are so skillfully and thoroughly classified that much valuable information can be obtained from the study of vital statistics especially those of large cities. I have at my disposal a chronological summary of Chicago mortality covering a period of 60 years, issued annually by the department of health for Chicago. Besides Dr. Arthur R. Reynolds, the commissioner of health for Chicago, issues a bulletin once a week which is mailed to all physicians in Chicago, and to many others who are interested in this line of work. In it comparisons are made with the previous week, and with the corresponding week one year ago. At the end of each month, and of each year comparisons are again made and averages determined. We learn from Chicago statistics that there has been no Asiatic cholera in the city for 30 years, and that mortality from cancer is rapidly increasing. While mortality from cholera infantum and from diphtheria has greatly decreased during the last few years. The mortality from tuberculosis continues to gain ground; influenza, generally known as La Grippe, did not appear in Chicago until 1890, when a general epidemic in this country prevailed. The greatest mortality from this disease occurred in 1895, and the mortality was twice as great in 1901 as in the year 1902. The percentage of deaths from pneumonia is steadily increasing from year to year. The table illustrating the statistics for smallpox shows that the worst epidemic occurred in 1874 when the percentage of mortality was $6\frac{1}{3}$ per cent. In 1894 the mortality was $4\frac{1}{3}$ per cent, in 1895 there were no deaths reported from this disease in Chicago, and since that year there have not been more than a dozen deaths from this loathsome disease. Contagious diseases and

other epidemic diseases are the ones in which philanthropists in company with physicians will always take a deep interest, but probably the vital statistics concerning death, which the students of social science will be most likely to investigate and philosophize about are those which result from *violence*. The percent of death from violence to deaths from all causes in Chicago was 2 in the year 1851, 7 in the year 1901. The average percent of deaths from violence to deaths from all causes during the last 52 years was 4. Such deaths are grouped under the following heads: By accident, by suicide, by manslaughter, by railroad accident, by street car accident. As a matter of course deaths from accidents will increase with the amount of labor saving machinery used, and with the amount of traveling done on railroads, and with the increase of electric street cars, which run at rapid rate, and are well patronized. The vital statistics in which I am personally interested, and am the most inclined to investigate are the deaths by suicide, and the deaths by manslaughter, together with the physical, mental, social, commercial, and religious influences attending them. I trust that in the foregoing paper I have sufficiently illustrated the nature of vital statistics to show that they can be studied to great advantage in certain lines of social science. In closing I wish to urge upon the members of the Academy the need of adequate laws and methods of gathering and of recording vital statistics in Iowa, so that they may be fully and accurately secured and made accessible to philanthropists and to scientific students who may wish to use them. It is to be hoped that such a law, as there is on the statute books in the commonwealth of Massachusetts, and in some of the other states, will be enacted by the Thirty-first General Assembly of the state of Iowa, so that in time, the vital statistics of this state may be satisfactorily compared with the vital statistics of other states and countries.