

SCIENCE.—SUPPLEMENT.

FRIDAY, AUGUST 13, 1886.

MEDICINE IN THE UNITED STATES, AND ITS RELATIONS TO CO-OPERATIVE INVESTIGATION.¹

I PROPOSE to call your attention briefly to some points relating to the present condition and future prospects of medicine in the United States, and to the direction in which you may reasonably hope and expect from that country in the future the most useful co-operation in the improvement of medical science and art. I believe that these must be matters of interest to you, and that I can perhaps make clear certain peculiarities which do not seem to be as generally understood on this side of the Atlantic as it is desirable that they should be to insure sound judgment upon some of the results observed.

In the first place, permit me to call your attention to the fact that it is hardly possible to make any statements with regard to medicine in, or the medical profession of, the United States as a whole, which shall be definite and at the same time distinctive; that is, which will not apply almost equally well to medicine and the medical profession in other countries. This is due to the fact that there are great differences in the organization of the profession in different parts of America, so that what is true of one state would not be true of another; what is required as to fitness or qualification to practise in one place is not required in another; and the country covers so many parallels of latitude and meridians of longitude, making the conditions of life so diverse, and producing such differences in the prevailing diseases, that a man who is fairly qualified to practise in one section may be poorly fitted to treat the endemic diseases of another.

Let us begin by considering some of the things that American physicians complain about; in other words, some of their supposed grievances. One of these is that the profession is overcrowded; that there are too many doctors, both *in esse* and *in posse*, and that this is due to too low a standard of education, and to the want of legal restrictions as to the qualifications which shall give a man the right to practise. Statistics gathered in

1883,² showed that in the United States and Canada there were 90,410 persons calling themselves physicians, being in the proportion of 1 to every 600 of population. In Canada alone, there were 3487 physicians, or 1 to 1112 of population. If we take the figures of our last census, of 1880, the proportion of physicians reported, is 1 to 589 of population, or 17 per 10,000. In England and Wales, by the census of 1881, the proportion of physicians is only 5.8 per 10,000, but these figures are not properly comparable with those of the United States, because they do not include unregistered persons. If the same classes were included that are counted in the United States report, I presume that the proportion would be about 9 per 10,000, or a little more than half that in the United States.

In the United State the proportion to the population of those who call themselves physicians varies greatly in different localities; thus, in Colorado there are 29.3, in Indiana 25.2, in Oregon 24.3, and in Arkansas 23.5 per 10,000; while in New Mexico there are only 6.6, in South Carolina 9.2 and in North Carolina 9.7 per 10,000.

It is not easy to give satisfactory reasons for these differences; we can only say that they do not depend to any great extent upon local legislation. The proportion of physicians is generally lowest in the southern states lying east of the Mississippi, and highest in those regions where immigration has recently been active. If we compare, by localities, the proportion of physicians to the population with that of clergymen and lawyers, we find some curious differences. It seems that the lawyers in the United States number 12.7, while in England and Wales they are 6.6 per 10,000, but that on the other hand the clergymen are 14.6 in England and 12.8 in the United States per 10,000 of population. In many instances it seems that where the lawyers are most numerous the supply of clergymen is smallest. I believe that a fair proportion of physicians to population is about 1 per 1000, which is not far from the actual proportion in England, while the true proportion of practising physicians in the United States is about 1 in 750. We must admit, then, that there is at all events no scarcity of physicians in the United States, and, as we have over 80 medical schools at work, besides a fair proportion of medical immigrants, there is no immediate danger of any interruption to the supply.

¹ Condensed from the annual address in medicine delivered before the British medical association, Wednesday, August 11, 1886, by JOHN S. BILLINGS, surgeon U. S. A.

² Illinois state board of health report, 1884.

Let us now consider the second head of the complaint, viz., that the standard of education is too low. There is ground for this, considered with reference to some localities, but not for others. I said a moment ago that a man might be fairly qualified for practice in one part of the country and yet find himself at a loss in another. This needs a little explanation, which I can, perhaps, give most easily in connection with a map of the United States (chart i.). This map, which was prepared for a very different purpose, indicates by different shades of color, the relative pro-

struction in the office of his preceptor in Vermont or New Hampshire, supplemented by distant glimpses of a few cases in hospital in Boston or New York, will find himself at a loss at first in dealing with the emergencies of daily practice in Arkansas and Mississippi. He will be subjected to influences which at times are dangerous to one who is not acclimated, and which tend to produce depression of spirits, want of energy, and bad health. He will not have free and constant access to scientific companionship, nor be stimulated by the influence of learned societies, and he can-

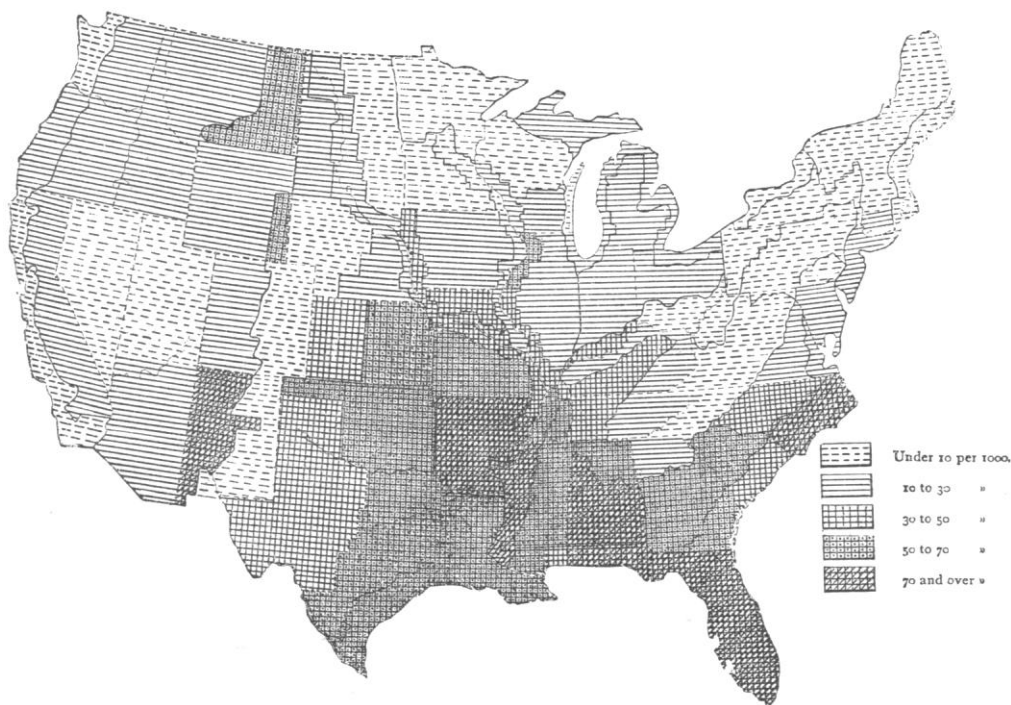


CHART I.—SHOWING THE DISTRIBUTION OF DEATHS FROM MALARIAL FEVER AS COMPARED WITH DEATHS FROM KNOWN CAUSES.

portion of deaths reported as due to malarial disease to the total number of deaths in different parts of the country, for the census-year 1879-80. You will note how comparatively light the tint is in the north and north-east, and how dark the shades become in the south and in the valley of the Mississippi, thus indicating the great differences which exist as to the prevalence and deadly effects of the malarial poison in different sections of the country.

As compared with the north and east, much of this malarious region is a thinly settled country, an almost purely agricultural country, and not a rich country. I need hardly tell you that the physician who has received his chief clinical in-

struction in the office of his preceptor in Vermont or New Hampshire, supplemented by distant glimpses of a few cases in hospital in Boston or New York, will find himself at a loss at first in dealing with the emergencies of daily practice in Arkansas and Mississippi. He will be subjected to influences which at times are dangerous to one who is not acclimated, and which tend to produce depression of spirits, want of energy, and bad health. He will not have free and constant access to scientific companionship, nor be stimulated by the influence of learned societies, and he can-

not avail himself of the ordinary sources of amusement, education, and rest, such as art galleries, the drama, libraries, and museums, etc., which are found in the large cities. Moreover, the pecuniary reward which the practitioner in many of these places can reasonably hope for is comparatively small. Nor can the inducements for highly educated physicians to settle in thinly settled localities be made stronger by any form of penal or restrictive legislation. Any attempt to fix a standard of requirements or qualifications for practice which shall be the same for such rural districts and for the large cities and manufacturing towns, must result in the adoption of what competent

judges would consider so low a standard as to be ridiculous and useless. The demands are widely different, and corresponding differences exist in the sources of supply, that is, in the medical schools.

There is a class of medical schools in the United States whose object is to give the minimum amount of instruction which will enable a man to commence the practice of medicine without much danger of making such serious and glaring blunders as will be readily detected by the public. There are other schools whose aim and object is to make fairly well trained practitioners; the general character of the instruction given in these being substantially the same as that given in your English hospital schools. The results of such a three-years' graded course of instruction in medicine as these schools furnish, depend upon the character of the material upon which they work; that is to say, upon the general preliminary education possessed by the student at the time of his matriculation. This is evidently too often defective, and only a few schools have thus far ventured to establish any standard of preliminary examination which at all approaches in its demands that which is required in England.

As a rule, the efforts which have been made to secure legislation upon medical matters in America have come from the profession itself and have been chiefly urged and recommended by physicians. The general public, and even the educated public, has shown very little interest in the matter. It does not demand protection against ignorance, but entrusts the care of its health and the lives of those who are nearest and dearest to it to almost any one who announces himself as prepared to take charge of them. The number of those who profess to practise medicine in the United States and are not qualified to do so is undoubtedly large, though by no means so large as one might suppose after listening to the impassioned eloquence which is duly aired every year upon the subject. There are some advertising charlatans, and travelling quacks are occasionally to be met with, but they are rare.

But what evidence have we as to the results upon the health and life of the people? What shall we take as the measure of the difference of skill in physicians? The death-rate? If we compare the death-rate of the United States with those of other civilized countries, we find that it is as low as any with the exception of Sweden. Does a low death-rate mean better sanitary condition, or more skill among the doctors? For the last twenty years the death-rate has been diminishing in England; the average amount of life for each person here has been increased, but I observe that the sanitarians claim this as proof of the

value and importance of their efforts, and that nothing is said about its being in any way due to increase in medical skill or to improvements in medical science. Evidently this test is not a convincing one. Almost the only matter in which figures seem to demonstrate the importance of superior medical education and skill is in the statistics of deaths due to childbirth and of the results of surgical operations.

The proportion of deaths from childbirth to the number of births is decidedly greater in the rural districts than in large cities, and among the colored than among the white population. Similar differences are found in England, and are undoubtedly due to the better treatment afforded in the cities by the surgeons and hospitals.

Now, seeing that really efficacious legislation with regard to medical education or to the practice of medicine must, like all efficacious legislation, be substantially in accord with public opinion, since it is impossible to continue to punish for any length of time that which public opinion does not condemn; and as the great mass of the people of the United States have not as yet had such evidence as they can understand, and which would thoroughly convince them that it is to their interest to suppress quackery, it follows that it is necessary to go slowly and to allow such evidence to accumulate.

To me it seems that the most important of the first steps to be taken in this direction is one which has already been taken in Great Britain — namely, the requirement that every death in the community shall be registered, and that in such registration satisfactory evidence shall be given as to the cause of death, sufficient at least to prove that such cause is what is known as a natural cause, that is, that it is not due to crime. When it is admitted that one of the duties of government is to provide for such registration, it follows, necessarily, that those persons whose certificates as to the cause of death are to be accepted must present evidence that they are properly qualified to make such certificates.

So far as the art of medicine is concerned, the demand has much, though by no means all, to do with regulating the quantity and quality of the supply; and there are few localities in the United States where the qualifications of the medical man are not fully up to the standard which the community is able to appreciate and is willing to pay for. The laws regulating the practice of medicine in the United States are all state laws. Of the various methods which have been tried in different states to insure by law that physicians shall be properly qualified, I will call your attention to two which are of special interest.

The first is that of Alabama, the principle of which is to organize the whole medical profession of the state, and use it as the means of regulating the qualifications of practitioners and of caring for the public health. The Medical society of the state of Alabama, with its branches, the county medical societies, thus forms a part of the machinery of the government; it appoints boards of medical examiners, selects state and county sanitary officials, supervises the registration of vital statistics, the administration of quarantine, etc., — in short, it is the state board of health, and the county branches are the county boards of health. This system has now been in operation nine years, and has gradually been consolidated and improved by educating local boards, and getting all physicians interested in it, until it is now working fairly well.

The second system to which I will call your attention, is that of the state of Illinois, which was commenced in 1877, or about the same time as that of Alabama.

In Illinois any one who presents a diploma, or license to practise, from a legally chartered medical institution in good standing, is entitled to practise, and the state board of health is to decide as to what shall constitute 'good standing.' The board of health also examines all persons who do not possess satisfactory diplomas, and who nevertheless wish to practise in this state.

One of the greatest practical difficulties in the way of providing any system of state examinations in medicine in the United States, is that public opinion will not support any law which can be supposed to condemn or in any way to injure homoeopathic and eclectic practitioners or their schools, and hence any proposed law relating to medicine, or to the organization of state boards of health, which does not recognize the existence of these sects, will in many states, at all events, meet with enough opposition to defeat it. In Illinois this difficulty was surmounted by the arrangement, that of the five physicians on the board, one should be homoeopathic and one eclectic. The Kansas law, passed last year, goes further in this direction, and provides that appointments must be so made that no school of medicine shall ever furnish a majority of the members of the board. Much to the surprise of many, the Illinois plan has worked very well — there has been no quarreling in the board — and the homoeopathic and eclectic members seem to have upheld quite as high a standard of qualification as their fellow members. The results of the work in Illinois have been very good. A large number of ignorant charlatans were forced to leave the state. The requirements of the board as to what shall

constitute a medical college in good standing, have been raised, and it has thus caused improvement in the medical schools, not only of Illinois, but of other states. Moreover, the neighboring states have been stimulated to action, not only by the force of example, but because they received the men who had been driven out of Illinois, and found the accession an unpleasant one.

The relations of the general government to medical education are indirect, but they have of late years become of very considerable practical importance, and are now exerting much influence upon medical investigations and literature. This is effected by the museums and libraries which are now being formed under the auspices of the government at Washington, and also, to some extent, by certain special investigations undertaken by the government in the interests of preventive medicine. Of these various agencies one of the most important is the library which has been formed at Washington, under the auspices of the medical department of the army in connection with the Army medical museum.

As regards investigations into the causes of disease, undertaken at the expense of the general government, only a beginning has as yet been made; but it is sufficient to indicate future possibilities and probabilities. The main importance of the work of the National board of health, which was organized in 1879 under the stimulus of the great yellow-fever epidemic of the previous year, was due to investigations upon the causes of yellow-fever and diphtheria, the relations of soils and of water-supply to certain diseases, etc. Similar investigations have been undertaken by state boards of health, and especially by the state board of health of Massachusetts, and the fact that governmental health departments are tending to work in this direction is significant as to future co-operation from such sources.

In this connection should be mentioned the National museum of hygiene, which has been formed under the direction of the medical department of the United States navy, which is now one of the most instructive collections of the kind in the world, and has also connected with it an excellent library and a well-equipped laboratory.

Comparative and experimental pathology is also receiving attention from the government under the direction of the department of agriculture, which is doing some good work in the investigation of the diseases of our domestic animals.

As to the condition of medical science and art in America, it partakes of the general progress, for the press now makes all discoveries the common property of the civilized world. The marked feature of the present epoch is the recent advance in

knowledge as to the relations between micro-organisms and certain diseases, and the strong stimulus which this has given to preventive medicine. Sanitation is becoming fashionable, and if we may believe some of its votaries, it is a very simple matter to prolong the average life-time to the scriptural, 'three score years and ten.' All that is necessary is that everything shall be clean, and every person virtuous. Having learned to distinguish those diseases which can be prevented much more easily and certainly than they can be cured, we may turn them over to the sanitarian, who has his own battles to fight with ignorance and prejudice. If he succeeds, and so far as he succeeds, he will change, in certain respects, the work of the practitioner.

I come now to the consideration of the second part of my subject, namely, the direction or manner in which we have reason to hope that medicine will be developed in the United States, and the kind of co-operation which you may reasonably expect to receive from the medical profession of that country.

In one sense medicine, as we have it to-day, is the result of co-operation; not of deliberate, centrally planned, and direct co-operation, but of natural selection from results produced by many men, often working at cross-purposes, and, therefore, wasting much energy, but nevertheless working, though blindly, to a common end. And it is safe to predict that in the future much of the best work will be done in the same way, by individual effort inspired by the love of science, by personal ambition, etc. But the results obtained in this way come slowly, and some things that we want can hardly be obtained by individual effort, even if we were willing to wait, hence we must look to organization for help.

In this broader view of co-operation it is interesting to consider those fields of labor to which comparatively few physicians can devote themselves, because of want of time and opportunity, but whose proper working is, nevertheless, of the greatest importance to the practitioner.

One of these is experimental laboratory work, and in this direction the prospect of valuable contributions from America is now exceedingly good. Some of the wisest of our most wealthy men have shown their appreciation of the responsibilities which riches entail on their possessors by seeking new channels through which to benefit their fellow-men. While the old and well-known methods of endowing hospitals and charitable institutions are not neglected, there is apparent an increasing tendency to endeavor to promote the advancement of knowledge, and especially of such knowledge as tends to the mitigation of suffering and the im-

provement of the race, to furnish means for the investigation of disease, to provide laboratories, and to endow medical schools, and thus place them beyond the reach of the temptations and difficulties which must always exist when such schools are dependent upon the fees of students, and are, therefore, practically commercial manufacturing establishments.

As illustrations of this tendency, I may mention the bequest of £1,400,000 by Johns Hopkins to endow, in the city of Baltimore, a university and a hospital of which the medical department is to be a special feature, to be provided with the best laboratory and other facilities for original investigation as well as for teaching; the gift of Mr. Carnegie to the Bellevue hospital medical school of New York in the shape of a well-equipped pathological laboratory; the presentation by Mr. Vanderbilt and members of his family, to the College of physicians of New York, of £200,000, to provide for that school new buildings and clinics having the best means of teaching and research, and the endowment by an unknown donor, of a laboratory for the University medical college of New York, with the sum of £20,000.

As the class of men who have wealth, leisure, and knowledge becomes greater, there comes an ever increasing demand, not only for the best medical skill, for the most expert practitioner, but also for exhaustive research in every direction which promises to furnish new means for the prevention or relief of suffering, and for warding off, as long as possible, the inevitable end; and hence there is little reason to doubt that the examples I have named will be followed by others in the near future. With such opportunities, and under such conditions and influences, the stimulus to the young and ambitious worker is strong; we have abundance of material of this kind upon which the process of natural selection can operate, and there is little reason to doubt that the result will be substantial and valuable contributions to physiology, pathology, and therapeutics.

There is another most important means of advancing medical and sanitary science which only a government can furnish, and in which field of work England now stands pre-eminent—I refer to vital statistics. In this field, the United States government has thus far done but little, yet enough to show the great interest and value of what we have a right to hope will be done in the future by combining the work of the several states. This is one of the fields in which international co-operation is most desirable; it alone can furnish data sufficiently complete and reliable for a scientific consideration of the relations of disease to geographical and race distinctions.

To illustrate the possibilities in this direction, I will call your attention to some peculiarities in the distribution of deaths from certain causes in different parts of the United States, and for this purpose I shall make use of the data from our last census, taken in 1880. We have no general and uniform system of registration of births and deaths. The larger cities, and about half-a-dozen states, have such a system, but for much the larger portion of the country the only means which we have for determining differences in amount or causes of mortality in different locali-

ties, although they do not furnish definite and scientific answers.

Take, for instance, the map of the United States upon which, by varying shades of color, is shown the proportion of deaths reported as due to cancer, as compared with the reported deaths from all causes. (Chart ii.)

The mortality from cancer in the United States is proportionately greatest in the New England states, somewhat less so in New York and Pennsylvania, and it causes the least proportion of deaths in the Mississippi valley and the south

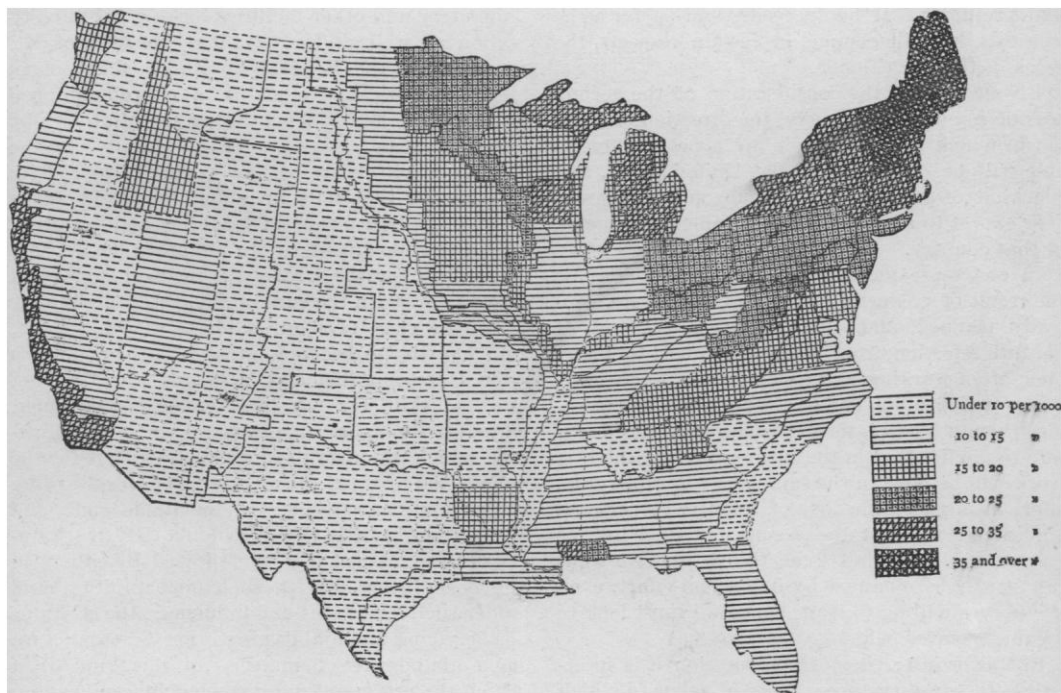


CHART II.—SHOWING THE DISTRIBUTION OF DEATHS FROM CANCER AS COMPARED WITH TOTAL DEATHS FROM KNOWN CAUSES.

ties is through the census, which is taken once in ten years. The data thus obtained with regard to deaths are imperfect, because when these are collected only at the end of the year, about 30 per cent of the deaths are unrecorded; and they are inaccurate, because the reports of the causes of death are not furnished by persons competent to give reliable information with regard to them. Nevertheless, these data are the best that we have; and although for a large part of the country they do not give us the actual number of deaths from any cause or set of causes, they do furnish some interesting information with regard to the relative prevalence and importance of certain causes, and suggest questions and lines for future investiga-

tion. The proportion of deaths from cancer in the United States is somewhat greater than it is in England; but it is not possible to make any accurate comparisons in this respect. Now why are the shades on this map so dark in the north-east and so light in the south? In the first place, cancer is a disease the mortality from which steadily increases with advanced age, as you may see from this diagram. Hence, cancer causes a higher proportion of mortality in those localities which have the greatest proportion of population living at advanced ages, and in the United States these localities are the New England states, as you will see by this map. Another explanation of the peculiar shading of the cancer

map is found in the relations of race to the tendency to death from this disease. The proportion of annual deaths from cancer per hundred thousand living population was, in round numbers, twenty-eight for the whites, and thirteen for the colored. That is to say, cancer is more than twice as prevalent among whites as it is among colored in the same localities, for these figures apply only to the south. On the other hand, cancer appears to cause a greater proportion of deaths in persons of Irish and German parentage, than it does among the rest of the white population, the indi-

and the contrast was much stronger in former years than it is at present; but this cannot be explained solely, or even to any great extent, by difference of temperature, because scarlet fever has often been epidemic in the tropics, and, on the other hand, in many localities in temperate climates it is among the rarest of diseases.

Diphtheria has been unusually prevalent in the northern portion of the United States for several years. During the census year it caused 2374 deaths out of every 100,000 deaths from all causes, while in England, for the year 1880, the deaths

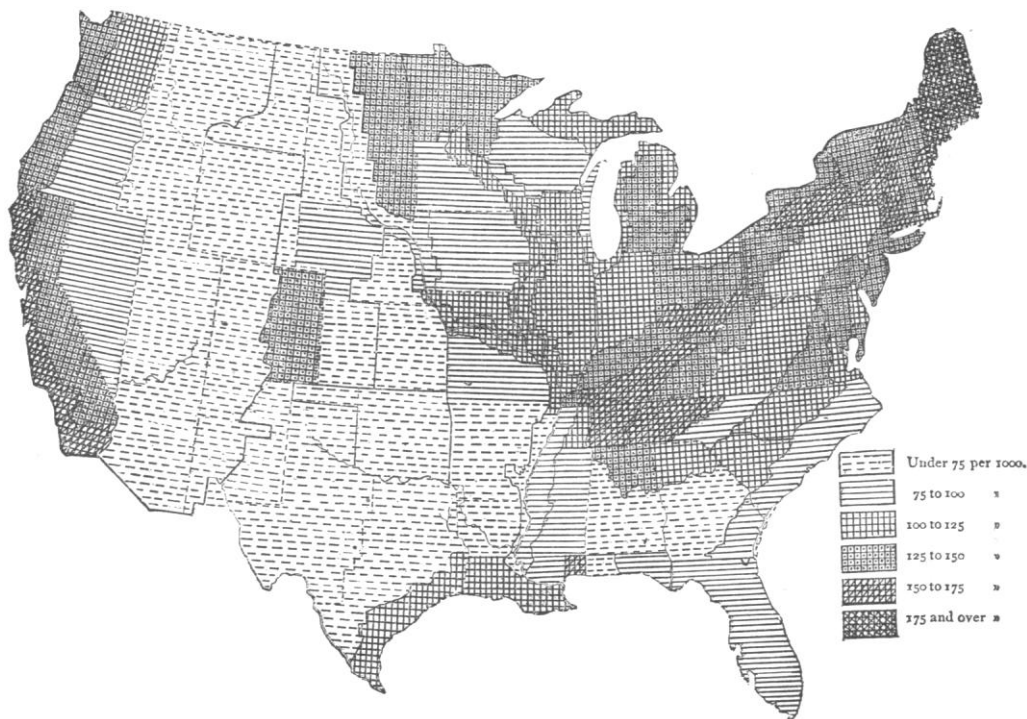


CHART III.—SHOWING THE DISTRIBUTION OF DEATHS FROM CONSUMPTION AS COMPARED WITH DEATHS FROM KNOWN CAUSES.

cations being that between the ages of fifteen and sixty-five, the Germans are especially liable to cancer; more so than the Irish, and decidedly more so than the average white population. Now when we remember that the greater part of the colored population is in the south, and the greater part of the Irish and German population is in the north, we have another reason for the differences in mortality caused by this disease in the two sections.

Scarlet fever is most fatal in the north, and, here again, the influence of race comes in, because in the negro race the mortality from this disease appears to be very low. This disease has always been much rarer in the south than in the north,

from diphtheria were 532 per 100,000 deaths from all causes; that is to say, the comparative mortality from this disease in England was less than one-fourth that of the United States for the same period. Diphtheria, again, is essentially a disease of the north, but especially of the north-west. It causes an excessive mortality in children of German parentage, sufficiently so to show that here again the influence of race comes into the problem, although, probably, only indirectly, that is to say, it is probable that it is the habits of a peculiar class of people which favors the propagation of the disease rather than any physical peculiarities in the structure of their bodies.

Consumption is a vague term, and, as used in

the census, no doubt includes many cases which were not true tubercular phthisis. It is reported as causing 12 per cent of all the deaths, or more than any other single cause. In England and Wales, in 1880, it caused a little over 9 per cent of all the deaths. Such wholesale ratios are, however, of little interest or value. There are very great differences in the liability to this disease in different parts of the United States, as the map (chart iii.) makes evident; and it is from a study of the causes of these differences in the data derived from large masses of people, combined with

sumption and that of pneumonia (chart iv.) is very striking. Here, again, we find that race peculiarity is an important factor in the problem, the proportion of deaths from pneumonia among the colored being much greater than it is among the white.

While we must consider the difficulties in the way of the improvement of the science and art of medicine, difficulties due to ignorance, to indolence, to conflict of interests, and to the eternal fitness of things, the existence of such difficulties is not a matter to be bemoaned and lamented over.

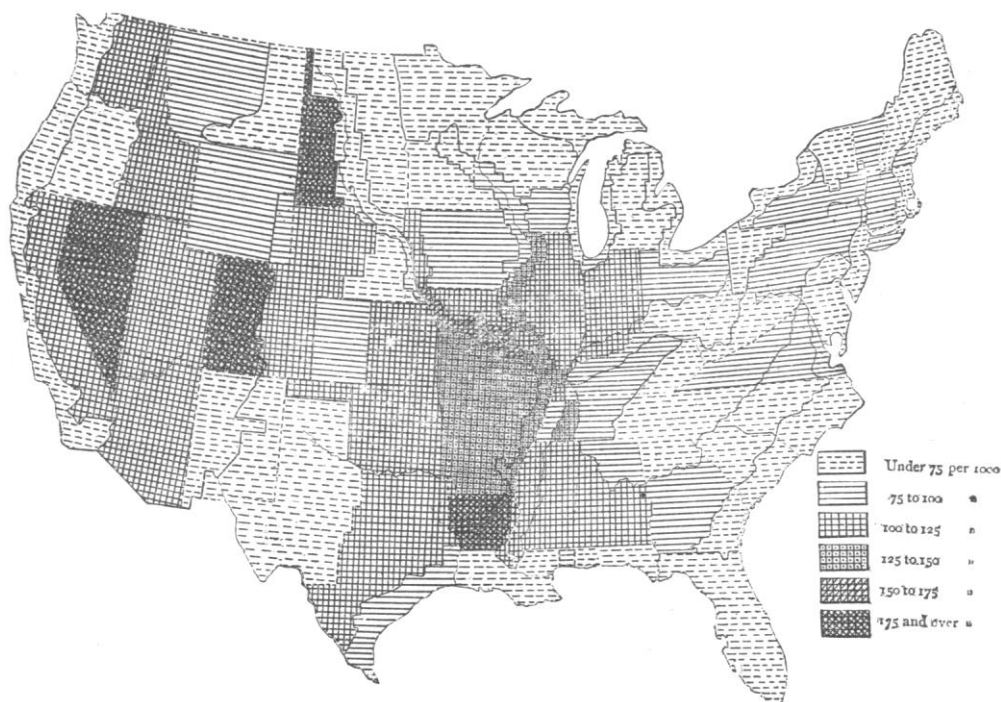


CHART IV.—SHOWING THE DISTRIBUTION OF DEATHS FROM PNEUMONIA AS COMPARED WITH DEATHS FROM KNOWN CAUSES.

clinical histories and experimental laboratory work, that we have good reason to hope to obtain knowledge, not only of the causes of this disease, but of better methods of prevention and treatment than are now at our command. It causes a greater mortality among the Irish than in other white races, and, perhaps, a greater mortality among the colored than among the white.

Next to consumption, pneumonia is reported as causing the greatest number of deaths in the United States during the census-year, giving a ratio of 8.3 per cent of all deaths, as against 4.8 per cent in England and Wales in 1880. Here, again, the local distribution of deaths is interesting, and the contrast between the map of con-

sumption and that of pneumonia (chart iv.) is very striking. Here, again, we find that race peculiarity is an important factor in the problem, the proportion of deaths from pneumonia among the colored being much greater than it is among the white.

These obstacles are the spice of life, the incentives to action, the source of some of the greatest pleasures which it is given to man to experience. As each man has special opportunities and duties, if he can only recognize them, so it is with guilds, with professions, and with nations. I have tried to indicate to you some of these opportunities which are presenting themselves to my colleagues, your brothers, in the lands beyond the sea, and I hope that I shall not be considered rash, or vain-glorious in saying that I believe they will so use those opportunities as to return compound interest for what they have received from the storehouse of our common inheritance.

JOHN S. BILLINGS.