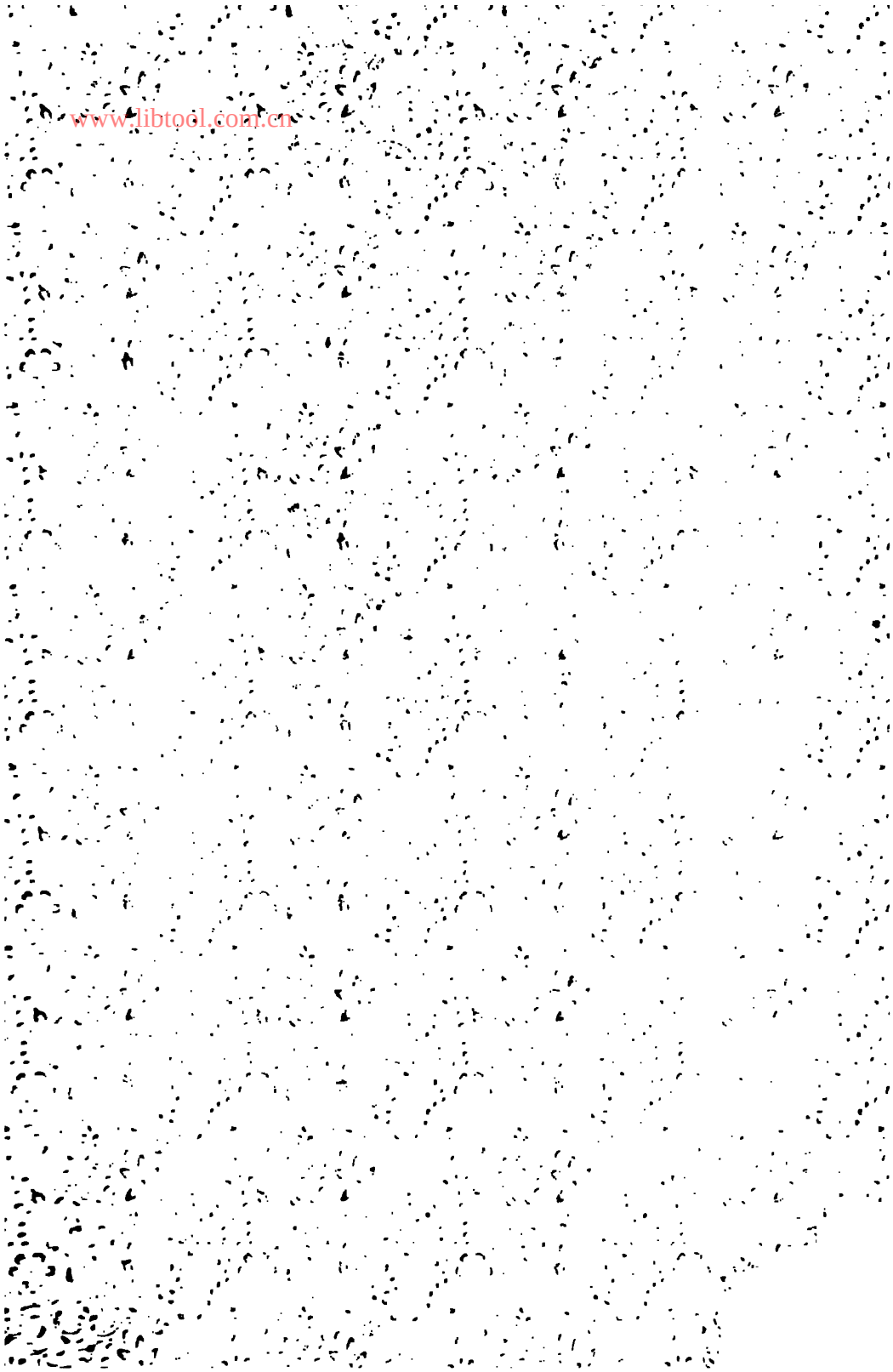

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PRESIDENT'S ADDRESS.

DR. DOMINGO ORVANANOS, MEXICO CITY, MEXICO.

It is my duty on this momentous occasion to address you, and neither the fear of wounding your ears with my poor English, nor the knowledge I have of my want of oratorical powers, are sufficient to make me waive this unmerited honor and the obligation imposed on me under our rules, as I fulfill this duty with special satisfaction, convinced as I am that I can count on your benevolence which I respectfully ask.

In the meeting of the American Public Health Association which was held in Brooklyn in October, 1889, a resolution was adopted which was moved by Doctor McCormack after being slightly amended by Doctor Wyman, which read as follows:

"*Resolved:* That in view of the rapid increase of traffic and commercial relations between this country, Mexico, Cuba and the United States of Colombia, and of the increasing importance of the establishment and cultivation of the most friendly relations between the sanitary authorities of our own country and of the above mentioned countries, let a cordial invitation be extended to the sanitary authorities of Mexico, Cuba and the United States of Colombia to send representatives to the future meetings of this Association, and let the secretary be instructed to address those authorities on the subject."

In compliance with this resolution, Secretary Watson sent a formal invitation to the Supreme Board of Health of Mexico, asking that body to send delegates to the meeting which was to be held in Charleston, S. C., in December, 1890. The board with pleasure accepted the invitation, and commissioned Professor José L. Gomez, now present in the meeting, and myself, to attend as representatives of Mexico.

The impression we received on presenting ourselves in the secretary's office of the Association in Charleston, was highly grateful to us, and has left the most pleasant impression. Dr. Baker, then president of this Association, as well as Doctors Watson and Gihon, showed us the greatest courtesy and attention, gave us all the information we asked for, and from the moment of arrival, served us as cicerones. We were presented to almost all the members of the Association, all of whom received us with marked favor. We understood that a new era was being opened for the Association, and that the benefits which our countries would obtain in everything connected with the progress of sanitary science and the practical application of the best methods for

the improvement of public health would be incalculable. When we came to this country, the Association had hardly got beyond the adolescent stage, it had only existed for eighteen years, but had passed beyond the experimental period, and had entered on an entirely practical life. This evolution was of the greatest use to ourselves as Mexican delegates, because our government had just enacted the sanitary code, and although we could count on a good body of laws relative to sanitary matters and public health, we did not have the necessary experience for the formation of good regulations, nor the practical methods which would enforce the observance of those regulations. We knew that the American Public Health Association was the only institution of any importance in the world which for some years past had earnestly endeavored to safeguard the interests of public health; that it had acquired an experience of unquestionable value as well as the competence that undoubtedly accompanies able and energetic work, in such a manner that no country in the world surpassed the United States of America in the practical and efficient application of scientific means directed to the protection of public health. It was to be regretted that Cuba and the United States of Colombia were at that time unable to attend the call of our brethren of the North, and from that time form a part of this Association; but as soon as Cuba saw the star of liberty rise above the horizon, she hastened to take an active part in our labors.

What are the practical results which we have obtained as regards the improvement of public health in the northern part of this continent by the union of those countries which now form this Association? What measures ought we to adopt to secure our still further progress in the future? This is the subject with which I propose to deal, by drawing attention to the most important events connected with it.

In the meeting of this Association which was held in Montreal, Canada, in the year 1894, the committee on nomenclature and forms of statistics, which was composed of Doctors Abbott, Lindsley, Hewitt, Pelletier and Monjaras submitted a report which, after being accepted by the executive committee, was approved in 1895. This report proposed the adoption of the nomenclature invented by Dr. J. Bertillon, for the diseases and causes of death.

The mortality statistics which form the basis of our knowledge of sanitary conditions in any locality had been kept up for many years in the United States, Canada and Mexico; but as these countries employ different nomenclatures, the results could not be compared except in very special cases, and it was therefore very justly considered that the first reform ought to consist in the establishment of uniformity in the

statistics, and this measure was found so satisfactory that several other countries adopted the same nomenclature, and others after them, so that it is now universally accepted.

In the Second International American Conference which was held in the city of Mexico from October 1901 to the end of January 1902, the representatives of the United States and of the Mexican Republic inspired by prominent members of this Association, presented a motion amongst others, which was formally adopted on the 29th of January 1902, and reads as follows:

"V. The Second International American Conference likewise recommends for the benefit of all the American Republics and in order that they may promptly and efficiently co-operate in everything connected with the subjects mentioned in the preceding resolutions, that the board of directors of the union of those republics should call a general convention to be held in Washington, of the representatives of the health offices of those republics, within one year from date on which the conference aodpts those resolutions; that each one of the governments represented in this conference should designate one or more delegates to attend that convention, with the necessary powers, in order that together with the delegates of the other republics, they may arrange the sanitary agreements and formulate the regulations, that in the opinion of the convention may be most beneficial to the interests of all the countries there represented; that the votes in said convention should be computed by republics giving each one of them one vote; that the convention should adopt the measures best adapted for the holding of future sanitary conventions on the dates and in the places that may be considered most suitable, and, lastly, that an executive council composed of at least five members should be appointed, which should hold office until the following convention is held, and the members thereof then renewed, with a president to be elected by ballot in the convention itself. This council to be denominated "International Sanitary Office, with residence in Washington, D. C."

The First Sanitary Convention was held in Washington, D. C. in December, 1902. Its object was to secure as far as possible, and by means of the mutual asistance and co-operation of the sanitary boards and corporations of the different republics in the New World, uniform action in the matter of quarantine, and the improvement of the health conditions in the sea ports.

As regards the quarantines, the convention studied the methods which ought to be employed to make them really efficient and prevent the introduction in one country of the disease existing in another, but at the same time restricting them as far as possible, so that the trade of the country should not suffer more than absolutely necessary.

As regards the sea ports, the convention decided on the methods

to be adopted in order to prevent, as far as possible, the importation or development therein of epidemic diseases, as well as to facilitate their suppression once they had appeared.

This convention was rather of a scientific and preliminary character, but nevertheless, it gave the practical results of fixing in a more exact manner, the conditions on which the sanitary rules relative to quarantines should be based in the future.

As regards our own country, Mexico, this first convention served as a powerful stimulus with the result that sanitary improvements were pushed forward in many parts. The Sanitary Code of the Federal District was amended; the campaign against yellow fever was pushed with extraordinary activity, the states of Vera Cruz and Yucatan doubled their efforts to stamp out the yellow fever in their respective territories, by enforcing regulations that only affected their own jurisdiction, but which were of great assistance in carrying out the rules laid down by the federal government

Boards of health were organized in different states which formerly had none, and occupied themselves exclusively with sanitary matters in their own territory, leaving to the federation everything relating to the ports and frontiers that could assume an international character.

The sanitary stations already existing were perfected and others established, equipped with the buildings, utensils and staff of employés, which were required for their service

In the port of Vera Cruz, the most important which the republic has on the Gulf of Mexico, after the completion of the colossal works which have converted into a closed and perfectly safe port, the sanitary works of the city were undertaken, as well as works for the supply of good drinking water in large quantity, and cement paving Arrangements have also been made for the carrying out of sanitation works in the ports of Manzanillo and Salina Cruz on the Pacific Coast, and in Coatzacoalcos on the Gulf Coast

The Second International Sanitary Convention was opened in Washington, D C, on the ninth of October, 1905, and delegates were appointed to that convention by the presidents of the republics of Chile, Costa Rica, Cuba, Santo Domingo, Ecuador, the United States of America, Guatemala, Mexico, Nicaragua, Peru and Venezuela, with power to sign the resolutions adopted, ad referendum

Time will not allow me to enter into a consideration of the utility of the measures approved by that convention, and I only desire to enumerate the titles of the chapters which were submitted to the discussion and approval of the commis- above referred to

CHAPTER I.

Rules which are to be observed by the countries which take part in the convention, whenever cholera, plague or yellow fever appear in their respective territories.

SECTION 1. Notification to and subsequent communications with the other countries.

SECTION 2. Conditions under which a particular territory may be considered contaminated or liberated from the disease.

CHAPTER II.

Measures to be adopted by the other countries against the territories which are declared contaminated.

SECTION 1. Publication of the measures adopted.

SECTION 2. Merchandise. — Disinfection. — Importation and transit. — Baggage.

SECTION 3. Measures in the ports and sea coast.

SECTION 4. Measures on the land frontiers. — Travelers. — Railroads. — Frontiers. — Rivers.

SECTION 5. Articles relating to yellow fever.

The Second Sanitary Convention was exceedingly fruitful in good results. Besides including the greater part of the American nations, its proceedings were of so formal a character that we might almost say that a treaty was celebrated on sanitary questions between the signatory countries.

In the Mexican Republic, this conference produced a most hopeful echo, such as the new vigor imparted to our sanitary services, the appointment of a representative in Hong Kong to watch over the class of Chinese and Japanese emigrants who started for Mexico, as well as to furnish the necessary reports with respect to the sanitary records of the ships and forward all information that appeared of any value, even using the cable whenever necessary. The appropriation granted to the board which amounted to $36,000, in the year 1892, and had been increased in the subsequent years, reached the sum of $670,000, which is exclusively dedicated to pay the sanitary staff and other expenses in the ports and frontiers, as the sanitation of the towns and cities is almost exclusively carried out at the expense of the local authorities.

The campaign against yellow fever was pushed forward with the greatest energy, to such a degree, that from 721 cases and 274 deaths from that disease, which were registered in the port of Vera Cruz

alone during the twelve months from October, 1901, to September, 1902, the figures dwindled in 1905 to 201 cases and 98 deaths in the entire republic, and to 171 cases in 1906. In the last year and the previous one, the campaign was carried on with such vigor against yellow fever, that in the course of the present year of 1907, we have only had four cases in the entire country, of which two were registered in Merida, Yucatan, in the month of February, and two in Vera Cruz, in that of March.

This is the first time in the history of Vera Cruz, founded more than 300 years ago, that the city has been free from this disease during the summer season. As a general rule, the yellow fever began to make its appearance in March, and reached its maximum in August, after which it would gradually decline till December, when very few cases were observed In this year not a single case has been observed throughout the republic since the month of April, and we can fairly assume that the disease has been finally exterminated.

It is naturally not impossible that for some reason or other the disease should again present itself, as has happened in New Orleans in the year 1905, and in Cuba during the present year, in spite of the efficient quarantine established in that city, and of the modern and well carried out precautions in the island, but following the same precautionary measures which we have at present in vogue, it is difficult to believe that yellow fever could assume an epidemic character in Mexico.

We owe these results to the energy, intelligence and labors of the President of the Supreme Board of Health of Mexico, Dr. Eduardo Liceaga, and to the President of the Republic, General Diaz

I have mentioned the above facts, not to satisfy any foolish vanity such as would be improper at my age and with my experience, but because I believe that such a statement will be found highly satisfactory to all members of this Association

It was this Association which gave the first impulse to our first practical sanitary works in the Mexican Republic. From the year 1892, we have not ceased to send a numerous delegation which has come to these meetings with the desire to slake its thirst for knowledge and to perfect its practice Step by step, we have kept ourselves informed of the great improvements relating to public health, which have been carried out in Canada, the United States and Cuba. What a difference from what was said by Dr Liceaga in the year 1892, when he expressed himself as follows in the opening session of this Association

"Very little has been done by us in the sanitation of our towns, and we are not ashamed to confess it, because we are forming a new

people which is desirous of obtaining an exact knowledge of the evils from which it suffers, so as to find the remedy. Our governments have given us good sanitary law, and it is now our duty to dedicate all our intelligence, our zeal and our energies to the service of our fellow citizens, by our own obedience and enforcement of those laws, and thus contribute to the great work which has been undertaken by this Public Health Association, whose noble purposes have given such good results in Canada and in the United States, and which we sincerely trust will give equally good results amongst ourselves."

In the same session, Dr. Formento expressed himself as follows:

"Yellow fever is a curse that keeps us from the southern climates of America."

"If this meeting could only find the means of permanently stamping it out in all points of the continent, it would well deserve the blessings of future generations."

Well, gentlemen, all the countries which take part in this Association, have contributed with faith and enthusiasm to the improvement of the public health throughout the continent, and have been enabled to almost entirely extirpate yellow fever from our coasts. Our vice-president, the late Doctor Reed, associated with Doctors Carroll anl Agramonte, demonstrated by means of memorable experiments, which will always form an epoch in the history of this hemisphere, that yellow fever is transmitted by the intervention of the mosquito called *Stegomyia fasciata*. This discovery has served as a solid basis on which to found our present system of campaign against yellow fever, and it is now our duty to continue with the greatest constancy and perseverance, the struggle which may be said to be approaching its close.

We have done something, gentlemen, for the benefit of public health; but nevertheless, there is yet much to be done. In proportion as science advances, the practice becomes more complex, more full of details, and the number of laborers becomes greater from day to day. The labors of our Association have, to a certain extent, changed their direction; following the impulse of the requirements of modern hygiene, we now desire to know at once the best methods of quarantine, of disinfection, for the isolation of the sick, and so on. We desire to know the methods which will facilitate the resolution of many problems in practice; to investigate the difficulties which from time to time arise, and decide on the methods of overcoming them. In one word, each one desires to be able immediately to take advantage of the experience of the others. We may perhaps find it indispensable to form, as some years ago we formed a bacteriological section, for the purpose of communicating the methods relating to the technical part of this science, provided the

Association considers it desirable, another section composed of health officers. The object of this section would be to furnish mutual information between the gentlemen who fill those offices; to encourage the perfect confidence and harmony that should always reign between them; to give the support and protection that may be necessary, and to acquire that faith which each should have in the veracity of the other, with a conviction that all are fully penetrated with the immense responsibility under which they lie before God and men, to look after the most precious interests of humanity, such as the health and life of their fellow citizens.

In consequence also of the progress of science and sanitary practice, the opinion has been formed and becomes every day more general, that just as the sanitary organizations of the cities are under the control of the different state boards of health, so the states ought to recognize a common centre, which would be the one called on to organize a uniform, energetic and efficient action. One of the presidents of our Association, Dr. Hosmer A. Johnson, already pointed out the urgency of this organization in the year 1889, and in 1892, in the meeting held in the city of Mexico, Dr. Manuel Septien of Querétaro expressed himself as follows:

"The Medical Press of the United States has several times spoken of the urgent necessity of creating a department of health. In the present year, Senator Sherman of Ohio presented a bill for the organization of a medical department of public health. This bill was the work of a commission made up of thirty members of the American Medical Association.

"A department of health would represent the medical conscience of the nation, would educate the people in all matters relating to health, would unify, preside over and utilize the labors of the state boards of health, thus establishing a focus or centre from which would radiate the powerful action of government in all directions, penetrating even the remotest corners of our territory.

"The organization of such a department," continued Senator Sherman, "would be a declaration by Congress that the improvement in the public health is a supreme law, and that in the future progress of civilization, medicine would take its proper place amongst the other departments of State.

"The same idea has also presented itself in England and Germany, and there can be no doubt that we will see it realized before long."

"The people and government of the United States have received it with enthusiasm. This great nation which was only born yesterday, and now astonishes the world with its prodigious development, without precedent in history, owes its marvellous prosperity to the practical character of its sons, and to the wise legislation which governs it. In spite of its deep rooted republican instincts and its firm adhesion

to the independence of the states, the nation recognizes the necessity of submitting to a central authority which will represent the sanitary interests of the entire country so as to unify them and give them the best direction.

"Mexico, which is no less great than her elder sister to the north, animated by the spirit of progress and culture, and by her noble ambition to occupy the place which pertains to her in the concert of nations, will also welcome this thought, and put in execution, whenever her legislatures have acquired the conviction that there are no questions so pressing or of greater importance than those which relate to the health and life of her citizens, because on these principally depend the prosperity and advancement of the motherland."

In the meeting of this Association which was held in Mexico in December of last year, Doctors Mayer and Mesa submitted a resolution which, with a recommendation and the endorsement of the executive committee, was approved by this Association. It proposed the appointment of a committee for each one of the countries which participate in our Association, and which would study whether the time had arrived to organize in each of the nations, a department of health, and which would at the same time indicate the steps which in its judgment ought to be adopted to obtain the realization of this desire.

It is probable that the respective committees will present their reports in this meeting, and I would beg all the members of this Association to make a careful study of the subject so that we can take some action, as the time has now arrived to recommend a resolution to the Third International Sanitary Convention, which is to meet in the city of Mexico from the second to the fifth of December of this year.

Perhaps public opinion is now ripe to give a favorable reception to proposals for the creation of a department of public health, as both in this country and in Canada, the people have, for more than thirty years received abundant instruction in sanitary matters. Wherever this Association has presented itself, whether in large or small cities, it has diffused in clear and easily understood terms the scientific principles and the utility of sanitary methods; it has shown how those methods prevent disease, prolong life, notably diminish the mortality rates, and render our transit through this world more pleasant and agreeable. The education in matters of hygiene is much less advanced amongst the Mexican people, but on the other hand, as we have seen, the sanitary authorities have been able to control several epidemics, and this has been due to the faith and energy which arise from a conviction of the efficacy of the measures employed, so that the people could do no less than acknowledge that those methods were beneficial, and there is almost no resistance to their execution. It is now a common thing for

individuals and political authorities of the cities to consult competent persons when they see the danger approaching, and strictly follow out the advice so received.

I believe that the people of the entire North American continent desire with more and more sincerity and earnestness to receive a more decided and efficient protection on the part of our governments, in matters connected with the preservation of health and life; they desire more liberal appropriations to cover the expenses which tend to the improvement of public health, and I believe that nobody nowadays entertains any doubt that "Salus populi, suprema lex."

The entire community now recognizes that it has to fulfill two obligations: The first, to destroy all causes of transmissible diseases which may be found within itself, and to diminish its ravages when that cannot be done, and the second, to prevent the introduction of disease from outside, by taking the most efficient steps known for that purpose, but at the same time, with due regard to the interests of the public and commerce.

The entire world feels every day a greater interest in sanitary matters, and all of us who have attended the annual meetings of this Association for some time back, have been able to prove, both by the increased attendance, as well as by the evidences of sympathy, and the courtesies of which we have been the object on the part of the authorities and the public, the special interest which has been awakened in these matters.

At this very moment we have a further proof of my assertion, when we see amongst us the most Honorable F. P. Stoy, mayor, and Rev. Melville E. Snyder.

In closing this address, I believe I express the sentiments of the American Public Health Association, in tendering our sincere thanks to the Hon. F. P. Stoy and Rev. Melville E. Snyder, to the local committee and to all the people of this beautiful city for the kind reception they have given us, which we will never forget, and for my part also, for the attention with which you have been pleased to listen to me

THE OUTLOOK FOR A GENERAL SYSTEM OF REGISTRATION OF VITAL STATISTICS IN THE UNITED STATES.

CRESSY L. WILBUR, M. D.,

CHIEF STATISTICIAN, BUREAU OF THE CENSUS, WASHINGTON.

With special design I have selected the same title as that of my paper before the twenty-third annual meeting of the American Public Health Association at Denver in 1895. It is well for us to take account of stock and sum up what actual progress has been made in the registration of vital statistics during the past twelve years. The Denver paper, moreover, was suggested by the "Report on Plans for Complete and Authentic Records of Deaths and the Causes of Deaths in the United States," which was presented by Dr. Elisha Harris at the fifth annual meeting of the Association at Chicago in 1877, so that we have in effect a thirty years' retrospect of American vital statistics in the three papers. How many of our anticipations have come true, and what reasonable hopes may we entertain for the future of registration in this country?

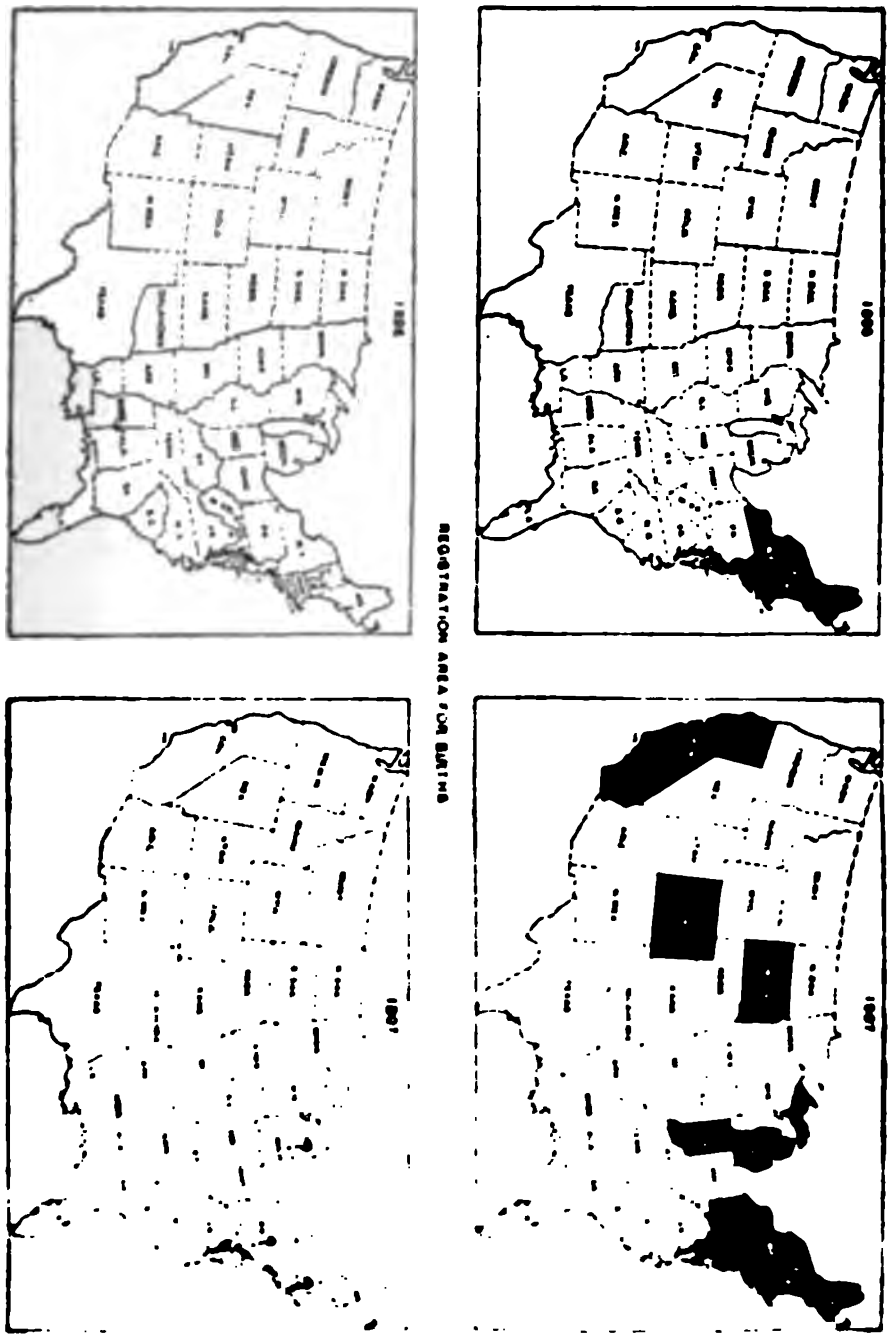
Dr. Harris said in 1877:

> Before the national census of 1880 is commenced, all of the states ought to have a good system of vital statistics organized and in harmonious operation, contributing comparable and numerically complete results. . . . Another decade of neglect to adopt an effectual system of registration in the United States would be greatly to the discredit of the intelligence and public spirit of American citizens.

It is thirty years since he spoke, and I invite your attention to the chart showing the condition of state registration in the United States in 1907, together with the progress made since 1895. The registration area for deaths has shown some advancement, although a large part of the country, including practically the entire South, and also such populous states as Ohio and Illinois, is still unrepresented. The registration area for births consists of a few interrogation points only, distributed where the "prospects" for future results seem most promising.

I shall take up in the same order the points made in my paper of 1895, and endeavor to show how later experience has sustained or discredited my assertions.

EXTENSION OF THE REGISTRATION AREA (STATES) FOR DEATHS AND BIRTHS: 1900 TO 1927



FAVORABLE INDICATIONS.

1. Not one of the states having accurate systems of registration at the beginning of the period has discontinued it.

We have lost one state (Delaware) from the registration area of 1890, and two states after passing effective laws requiring burial permits (Illinois in 1901 and Iowa in 1904), have repealed them and gone back to the primitive gold-brick methods of expecting complete returns to be made by undertakers (Iowa) or physicians (Illinois) without the absolutely necessary requirement of a burial permit issued by a local registrar who is responsible for the complete and prompt registration of all deaths in his district. The people of these states are in the same condition as a man who buys a device for "perpetual motion" expecting to run his factory thereby; the means are not adequate to the end proposed, namely, the regular and complete registration of births and deaths for important legal and sanitary purposes.

As to Delaware, probably this state does not furnish an actual exception to the statement. It is my impression that the registration in 1890 was just as poor as in 1900 — there has been no change in the law — and that the state was admitted in 1890 on account of exceptionally defective enumerators' returns for Delaware in that year. At present there seems to be absolutely no encouragement for better things in this state; I know of no state in which registration could so readily be made effective in which the prospect is so utterly hopeless.

2. Three states, Maine, New Hampshire, and New York, have been added to the registration column.

They have stuck, and, as you know, we have added Michigan, Indiana, and, during the past year, California, Colorado, Maryland, Pennsylvania, and South Dakota. And more are coming, I trust, in the immediate future. Nebraska and Utah have laws whose effective enforcement should bring them into line. Comprehensive laws have been passed during the present year in Minnesota, Montana, North Dakota (no appropriation as yet), Oregon, Washington, and Wisconsin, whose results will soon be known. Bills will be introduced in Ohio, Kentucky, and Virginia in 1908, and in Illinois, Kansas, and perhaps other states in 1909, so that we may have a number of accessions to the registration area before 1910, the year of the approaching decennial census.

3. The first indication of cooperation among the registrars of American states was signalized by the agreement of the registrars of New England, made at the last meeting [1894] of this Association to publish a summary of the statistics of the six states.

This valuable summary was published, but I believe that the co-operation has lapsed since the death of Dr. Abbott. Its place is taken by the wider union of all of the registration officials of the United States in the Section of Vital Statistics which is being organized at this meeting of the American Public Health Association, and by the annual reports of mortality statistics now published by the Bureau of the Census.

4. Municipal vital statistics have advanced more rapidly than state registration in general, and for many parts of the United States the data collected by cities under purely local regulations afford the only exact information obtainable.

This is still true for the entire South, and for many other parts of the country. I do not think it is true, however, that municipal registration has continued to advance as rapidly as state registration during the past twelve years. No new registration cities have been added since 1900, and we have even lost the few registration cities in Iowa on account of the interference of the pernicious state law of 1906 with the requirement of compulsory burial permits. The returns from some Illinois cities are very unsatisfactory for a similar reason. While cities should secure more efficient registration of births and deaths than rural districts, their registration reports are of very unequal value. Some cities have not even yet adopted the International Classification of Causes of Death, whose general use was recommended by the American Public Health Association in 1857, preferring the use of unique systems of home manufacture of alleged superior value. The importance of uniformity, even with concession of personal preferences in matters of minor importance, does not appear to be realized by them. This can best be corrected by the opportunity of meeting in a national organization with other state and city registration officials, and with the feeling that as we are working together for the advancement of the vital statistics of our common country, individual and personal differences should be forgotten in the adoption of methods that will afford uniform and fully comparable results. The Section of Vital Statistics in this Association can accomplish much in this direction, and affords the first opportunity for the meeting together on equal terms of state and city officials.

5. The United States government has undertaken work that, if continued, will have a salutary effect upon the isolated systems of registration now in operation. This work consists (1) of the collection of data relating to sanitary climatology by the Weather Bureau of the U. S. Department of Agriculture; and (2) the employment of better methods for the collection and study of vital statistics by the Vital

Statistics Division of the Census Bureau under the direction of Dr. Billings.

The work of the Weather Bureau was soon discontinued. That of the Bureau of the Census has been actively conducted since 1900, and especially since its establishment upon a permanent basis.

UNFAVORABLE INDICATIONS.

1. The difficulties under which American vital statistics will long labor from the sparse distribution of the population as a whole, will be dwelt upon in the present article as the most obvious and the most irremediable reasons for our failure as a nation to possess a system at all comparable with those of European countries. We cannot expect accurate registration in any except our most densely settled states for many years.

I still believe that lack of sufficient density of population is one of the most obvious reasons for failure of the extension of adequate registration methods in the United States, and shall further discuss the matter in the course of this paper.

2. None of the states having imperfect systems of registration has made any material improvement in accuracy during the past fifteen years [ending in 1895], although in several, e. g., Ohio, Illinois, Indiana, Michigan, the population is dense enough to maintain an efficient system. One state, Tennessee, adopted a registration law in 1881, and repealed it in 1883, after an experience of twenty months.

The situation is much more encouraging, as shown by the list of new registration states under the head of "Favorable Indications." Indiana and Michigan were admitted in 1900 (Michigan for the Census year 1899-1900). Illinois has tried and failed, and, as in all such cases, the outlook is less favorable than if no effort had been made. For this reason, the prospect for securing adequate legislation in Ohio in 1908 ought to be excellent. No change has been made in the present worthless system since 1869, and the opportunity is afforded of putting in a thoroughly modern and effective system without interference by recent abortive legislation. There is no reason why Ohio should not possess as excellent registration methods as Pennsylvania, and the alleged "vital statistics" of Ohio cease to be a laughing-stock, as at present, collected, as they are, by the antiquated and thoroughly discredited method of enumeration and compiled (causes of death, mind you!) by county judges of probate.

3. The most serious blow that the advancement of vital statistics has received, was the failure of the great state of Pennsylvania to

adopt a modern registration system, instead of a miserable makeshift, when the question came before her legislature in 1893. Half a loaf is not always better than no bread, when it is a question of vital statistics. Imperfect statistics may be far worse and more misleading than none at all, and it has been the experience of states with imperfect systems of registration, like Michigan [at that time, 1895], that the very existence of any system at all acts as an obstacle to the introduction of a better one, and thus retards the coming of efficient registration.

Full amends have been made by Pennsylvania for this "most serious blow" by the adoption in 1905 of a most complete and efficient registration law, whose enforcement warranted her admission to the registration area in 1906, and which may well be taken as a model for all states possessing resources adequate for as thorough registration. Instead of being the "most serious blow," as in 1893, her action in 1905 is the greatest encouragement and the most substantial assurance for the ultimate success of proper registration methods in the United States that has yet been afforded in the entire history of American registration. If a great state, with the utmost diversity of population and conditions of life, can, by the adoption of proper methods, change from a non registration to a registration state in a single year, and that too, after fifty years and more of absolute failure under imperfect laws, it is the best evidence that we are upon the right track; that the essential principles of registration recommended by the American Public Health Association and by the Bureau of the Census are *right*, and will bring *results*.

4. There are indifference and lack of enthusiasm on the part of many public health officers on the subject of vital statistics.

This feeling still exists, but I believe that it will be one of the functions of our new organization of registration officials to diminish it. Some health officers are tired of chasing the "rainbow gold" of elusive data which they attempt to collect under necessarily defective laws. The importance of vital statistics as the fundamental basis of public health work should not be lost sight of, and while it is well to have a special section, such as we propose to organize at this meeting, for the technical discussions, there should be at least one general paper on vital statistics read in the general session at each annual meeting of the American Public Health Association, and the members of the Association who may not be members of the section should feel that we are merely their agents in our special work and that we can accomplish little without the constant backing of their interest and support.

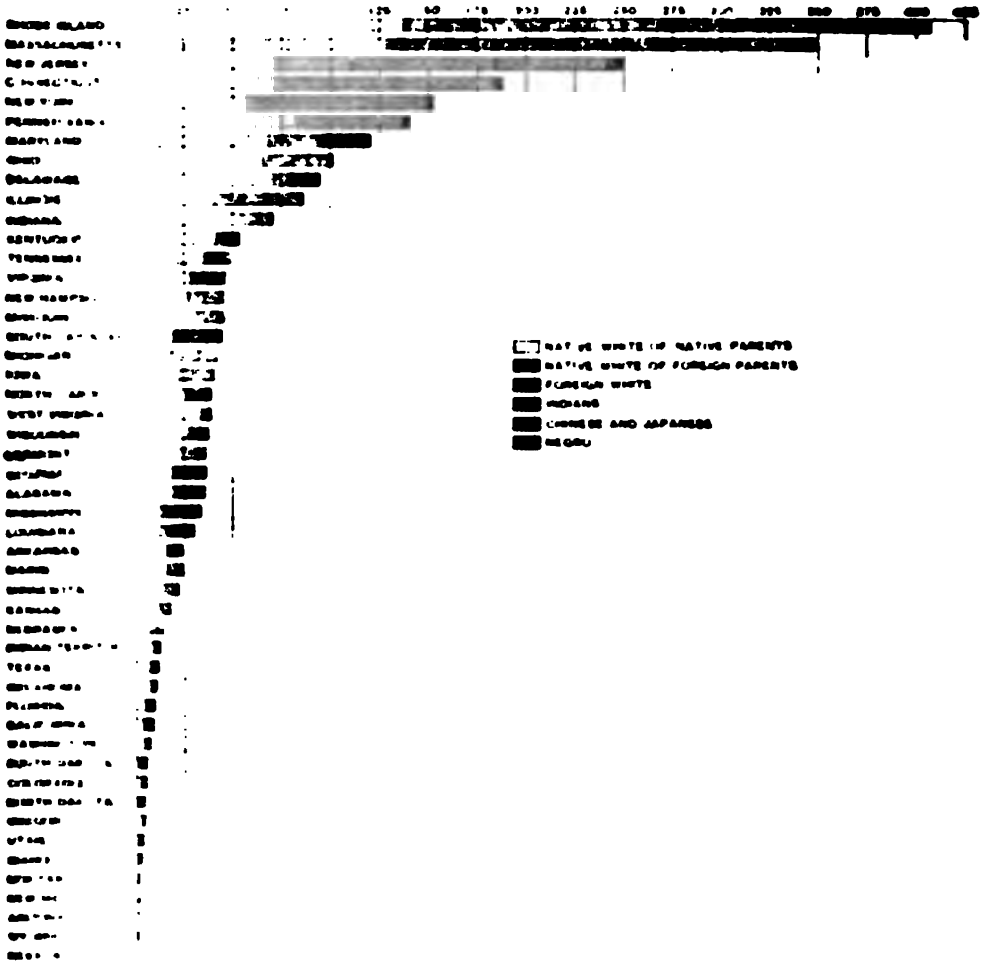
INFLUENCE OF DENSITY OF POPULATION ON ACCURATE REGISTRATION.

Density of population is admittedly a very important factor in the practical collection of vital statistics, so much so that one might almost say that the page of the Compendium of the Eleventh Census exhibiting the changes in the density of population of the states of the Union according to successive censuses, holds within itself the history of the past, as well as the prophesy of the future, of vital statistics in this country.

This remark is, in general, true. It is especially true of all that portion of the country in which the registration of vital statistics has made any progress whatever. But density of population is not the only important factor, and many elements are interwoven into the problem so that it is difficult to demonstrate the relation of cause and effect in all cases. The density of population of each state, with respect to its constitution by nativity, parent nativity, and color, is shown in the following diagram based upon the enumeration of the Twelfth Census:

The relation of density of population and certain other conditions to the development of effective registration of deaths may be seen in the following series of exhibits (1 to 17). The data are usually for the year 1900, although some later figures are given for manufactures (1905) and property per capita (1904) in order to show the tendency of progress. Registration states in 1907 are indicated by bold-faced type. Years in parentheses following state abbreviations show dates of enactment of past laws, or time when the state authorities expect to introduce legislation, which it is *hoped* may bring the states in question into the registration area. Several excellent laws enacted in 1907 have not yet been practically tested. Years in brackets (Illinois, Iowa) show dates of enactment of laws requiring burial permits, and which would probably have brought those states into the registration area by the present time if they had not been repealed; in the case of Delaware, the bracketed year is the last for which it was accepted as a registration state. I shall not attempt to discuss the several exhibits in detail, but some features may be noted:

(1) With the addition of Pennsylvania and Maryland to the list of registration states in 1906, we have an unbroken series of the eight states with greatest density of population in the registration column. There should be twelve if the promising movement in Ohio bears fruit next year; if the determination of the State Board of Health of Illinois to redeem the unfortunate action of 1903 succeeds; and if Delaware can be awakened from apathy to again become a registration state. Some of the new registration states are of very sparse popu-



lation (California, South Dakota, Colorado), which implies great difficulty in securing complete registration; in two of these (California, Colorado), this is to some degree offset by high concentration of city population as shown by the next exhibit.

(2) A closer relation is shown in the proportion of urban population (places over 8,000 in 1900). Eleven of the sixteen state registration areas (counting the District of Columbia among them) were above the average in percentage of urban population. Many Southern states of considerable density of population are low in this list. Illinois, Delaware, and Ohio are the only non-registration states above the mean in this respect.

(3) Manufactures, like urban concentration, are related to density of population. Eleven registration states of the sixteen are above the average. Montana and Wisconsin passed comprehensive laws in 1907. Illinois, Delaware, and Ohio are again the delinquent members of the group. For very sparsely populated areas like Arizona no indications can be drawn.

(4), (5) The figures in these exhibits are somewhat more pertinent than those of (3), as they exclude neighborhood and mechanical industries, and hence would seem to be more closely related to urban aggregation. The movement from 1900 to 1905 may be noted. Washington is above the average in the latter year; a registration law was passed in 1907 and is now under test. Delaware shows a decline in rank.

(6) A generally inverse relation is shown in this table, the states least dependent upon agriculture having the best registration. Reasons for the failure of effective registration in Ohio and Illinois are suggested, but Delaware is closer to the registration states in this respect. The apparently exceptional position of South Dakota is worthy of note. Farming means distance to be overcome, lack of facilities of communication, and hence accurate registration is necessarily more difficult and should be especially favored in order to maintain the same standard of efficiency as can readily be effected in villages or cities; rural free delivery should have a great and most beneficial effect in promoting the extension of registration.

(7) An inverse relation is shown for the proportion of colored population. Only two registration areas are above the average in this respect, and of these, Maryland was not admitted until 1906 and the District of Columbia is co-extensive with the city of Washington and its registration laws are directly enacted by Congress. So far there has been practically no exception to the rule that effective registration of vital statistics can not be conducted in a state having a very large proportion of colored population. Of course this rule, or, rather, this experience, must find its exceptions if we are ever to have truly national vital statistics. Attempts will be made to enact legislation for this purpose in Kentucky and Virginia in 1908. Both of these states had systems of vital statistics before the civil war, which were fully abreast of the knowledge of the times; and should their efforts succeed next year, it will throw an atmosphere of hope about the movement throughout the entire South which is now almost entirely wanting.

(8) Eleven of the sixteen registration areas have a proportion of foreign white persons higher than the average, and, conversely, the greater the percentage of native white Americans, the less the probability of effective registration laws. Much of this may be coincidence, depending upon the different areas of distribution of immigration and the colored population of the South, but undoubtedly a person who had learned the importance of the registration of births and deaths by experience in his home country, as in England, Germany, Italy, or Sweden, would more intelligently support the enactment and administration of such legislation than a native American who was entirely ignorant of the subject and unaccustomed to the orderly conduct of vital records.

[illegible] Wealth in itself does not seem to have a very close connection. The states at the bottom of the list in this respect all have a large colored population.

[illegible] Illiteracy [illegible] very important, sustaining an inverse relation to the desire and possibility of registration. But the states at the top of the list [illegible] have not all accomplished the best results.

[illegible] than the average amount of native white illiteracy has been [illegible] in the registration area, except Delaware in 1890 [illegible] in 1910. Not only the proportion [illegible] illiterate white [illegible] make the attempts at registration in Virginia and Kentucky most difficult [illegible] reason they should receive the greater credit when [illegible] at last.

[illegible] Foreign white illiteracy seems rather to match with effective registration [illegible] due to the presence of uneducated immigrants in [illegible] Eastern states having good registration laws.

[illegible] the registration states are [illegible] relation. In South [illegible] colored illiterates [illegible]

[illegible] communication [illegible] of advantage to registration [illegible] with average density of population, that one with the highest [illegible] per [illegible] inhabitants should surpass. At the [illegible] states with large [illegible] facilities [illegible] length of railroad.

[illegible] in [illegible]

[illegible] well- [illegible] The wide [illegible] establishment of a [illegible] accuracy of [illegible]

(1)

PERSONS PER SQUARE MILE: 1900.

D. C.	4645.3
R. I.	407.0
Mass.	348.9
N. J.	250.3
Conn.	187.5
N. Y.	152.6
Pa.	140.1
Md.	120.5
Ohio ('08?)	102.0
Del. ['90]	94.3
Ill. ['01]	86.1
Ind.	70.1
Ky. ('08?)	53.7
Tenn.	48.4
Va. ('08?)	46.2
N. H.	45.7
Mo.	45.2
S. C.	44.4
Mich.	42.2
Iowa ['04]	40.2
N. C.	39.0
W. Va.	38.9
Wis. ('07?)	38.0
Vt.	37.6
Ga.	37.6
Ala.	35.5
Miss.	33.5
La.	30.4
U. S.	25.6
Ark.	24.7
Me.	23.2
Minn. ('07?)	22.1
Kans. ('09?)	18.0
Nebr. ('05?)	13.9
Ind. T.	12.6
Tex.	11.6
Okla.	10.3
Fla.	9.7
Cal.	9.5
Wash. ('07?)	7.7
S. Dak.	5.2
Colo.	5.2
N. Dak. ('07?)	4.5
Oreg. ('07?)	4.4
Utah ('05?)	3.4
Idaho	1.9
Mont. ('07?)	1.7
N. Mex.	1.6
Ariz.	1.1
Wyo.	.9
Nev.	.4

(2)

PER CENT IN CITIES OVER 8,000: 1900.

D. C.	100.0
R. I.	81.2
Mass.	76.0
N. Y.	68.5
N. J.	61.2
Conn.	53.2
Ill. ['01]	47.1
Md.	46.9
Pa.	45.5
Cal.	43.7
Del. ['90]	41.4
N. H.	38.6
Ohio ('08?)	38.5
Colo.	38.1
U. S.	32.9
Wash. ('07?)	31.9
Mich.	30.9
Mo.	30.8
Wis. ('07?)	30.7
Mont. ('07?)	27.0
Minn. ('07?)	26.8
Utah ('05?)	25.2
Ind.	24.2
Wyo.	24.1
Oreg. ('07?)	23.9
Me.	23.7
La.	22.8
Ky. ('08?)	16.9
Iowa ['04]	16.8
Nebr. ('05?)	15.8
Fla.	15.0
Va. ('08?)	14.7
Kans. ('09?)	14.0
Tenn.	13.4
Tex.	11.3
Vt.	11.2
Ga.	11.0
W. Va.	7.7
S. C.	7.5
Ala.	7.3
Ark.	5.4
N. C.	5.1
Okla.	5.0
N. Dak. ('07?)	3.0
Miss.	2.6
S. Dak.	2.6
Ariz.	....
Idaho	....
Ind. T.	....
Nev.	....
N. Mex.	....

(3)

MANUFACTURES PER CAPITA: 1900.

R. I.	$430
Conn.	388
Mass.	369
N. J.	325
N. Y.	300
Pa.	291
N. H.	288
Ill. ['01]	261
Mont. ('07?)	247
Del. ['90]	246
Cal.	204
Md.	204
Ohio ('08?)	200
Colo.	191
Me.	183
Wis. ('07?)	175
Ariz.	173
U. S.	171
D. C.	171
Wash. ('07?)	170
Vt.	168
Minn. ('07?)	151
Ind.	150
Mich.	147
Nebr. ('05?)	135
Mo.	124
Kans. ('09?)	117
Oreg. ('07?)	112
La.	88
W. Va.	78
Utah ('05?)	77
Iowa ['04]	74
Ky. ('08?)	72
Va. ('08?)	71
Fla.	70
Tenn.	54
N. C.	50
Ga.	48
Wyo.	47
Ala.	44
S. C.	44
Nev.	40
Tex.	39
Ark.	34
S. Dak.	32
N. Mex.	29
N. Dak. ('07?)	29
Miss.	26
Idaho	25
Okla.	18

(4) FACTORY PRODUCTS PER CAPITA. 1900.		(5) FACTORY PRODUCTS PER CAPITA: 1905.		(6) AGRICULTURAL PRODUCTS PER CAPITA: 1900.	
R. I.	$386	R. I.	$430	D. C.	$ 3
Conn.	347	Conn.	379	Mass.	15
Mass.	324	Mass.	379	R. I.	15
N. J.	294	N. J.	370	N. J.	22
Pa.	262	N. Y.	315	Conn.	31
N. H.	261	Pa.	291	Pa.	33
N. Y.	258	N. H.	290	N. Y.	34
Ill. ['01]	232	Ill. ['01]	270	Fla.	35
Del. ['90]	224	Mont. ('07?)	234	Md.	37
Mont. ('07?)	217	Cal.	230	Ga.	47
Ohio ('08?)	180	Ohio ('08?)	221	N. C.	47
Md.	178	Wash. ('07?)	221	Va. ('08?)	47
Cal.	173	Del. ['90]	215	W. Va.	47
Ariz.	166	Ariz.	205	Ala.	50
Colo.	165	Me.	203	Del. ['90]	50
Me.	163	Md.	196	S. C.	51
Wis. ('07?)	158	Wis. ('07?)	187	N. Mex.	52
				La.	53
U. S.	150	U. S.	182	Me.	53
				N. H.	53
Vt.	150	Vt.	181	Tenn.	53
Wash. ('07?)	137	Colo.	170	Ariz.	57
Ind.	134	Mich.	170	Ky. ('08?)	57
Mich.	132	Minn. ('07?)	159	Utah ('05?)	60
Minn. ('07?)	128	Ind.	149	Ark.	61
Nebr. ('05?)	122	Nebr. ('05?)	145	Colo.	61
Kans. ('09?)	108	Mo.	134	Mich.	61
Mo.	102	Kans. ('09?)	129		
Oreg. ('07?)	88	Utah ('05?)	128	U. S.	62
La.	81	La.	125		
W. Va.	70	Oreg. ('07?)	122	Ohio ('08?)	62
Fla.	65	W. Va.	95	Miss.	66
Utah ('05?)	65	Fla.	85	Wash. ('07?)	68
Iowa ['04]	60	Va. ('08?)	77	Mo.	71
D. C.	59	Iowa ['04]	77	Ill. ['01]	72
Ky. ('08?)	59	Nev.	73	Wis. ('07?)	76
Va. ('08?)	59	Ky. ('08?)	71	Tex.	79
Tenn.	46	N. C.	71	Ind.	81
N. C.	45	Tenn.	65	Cal.	89
Ga.	43	Ga.	64	Minn. ('07?)	93
S. C.	40	D. C.	62	Oreg. ('07?)	93
Ala.	39	Ala.	56	Vt.	98
Wyo.	35	S. C.	56	Idaho	113
Ark.	30	Idaho	46	Okla.	114
Nev.	30	Tex.	45	Mont. ('07?)	134
Tex.	30	Ark.	39	Wyo.	131
S. Dak.	24	Miss.	35	Kans. ('09?)	143
Miss.	22	Wyo.	35	Nebr. ('05?)	153
N. Mex.	21	Okla.	31	Iowa ['04]	164
N. Dak. ('07?)	20	S. Dak.	29	Nev.	166
Idaho	19	N. Mex.	27	S. Dak.	172
Okla.	14	N. Dak. ('07?)	25	N. Dak. ('07?)	206
Ind. T.	7	Ind. T.	17		

(7)

PER CENT OF COLORED PERSONS: 1900.

N. H.	.2
Me.	.3
Vt.	.3
Wis. ('07?)	.5
Iowa ['04]	.6
Minn. ('07?)	.8
Mich.	.9
Nebr. ('05?)	.9
Mass.	1.3
N. Y.	1.5
Utah ('05?)	1.5
Conn.	1.8
Ill. ['01]	1.8
Colo.	2.0
R. I.	2.2
Ind.	2.3
N. Dak. ('07?)	2.3
Ohio ('08?)	2.3
Pa.	2.5
Kans. ('09?)	3.7
N. J.	3.8
Wyo.	3.8
Wash. ('07?)	4.2
Idaho	4.5
W. Va.	4.5
Oreg. ('07?)	4.6
Mo.	5.2
S. Dak.	5.2
Cal.	5.5
Mont. ('07?)	7.0
N. Mex.	7.7
Okla.	7.7
U. S.	12.2
Ky. ('08?)	13.3
Nev.	16.4
Del. ['90]	16.6
Md.	19.8
Tex.	20.4
Ind. T.	22.8
Tenn.	23.8
Ariz.	24.4
Ark.	28.0
D. C.	31.3
N. C.	33.3
Va. ('08?)	35.7
Fla.	43.7
Ala.	45.3
Ga.	46.7
La.	47.2
S. C.	58.4
Miss.	58.7

(8)

PER CENT OF FOREIGN WHITE PERSONS: 1900.

N. Dak. ('07?)	36.1
R. I.	31.9
Mass.	30.3
Minn. ('07?)	29.1
Mont. ('07?)	27.6
Conn.	26.6
N. Y.	26.4
Wis. ('07?)	25.1
Nev.	24.2
Ariz.	24.1
N. J.	23.7
S. Dak.	23.2
Cal.	22.6
Mich.	22.5
N. H.	21.4
Wash. ('07?)	20.6
Ill. ['01]	20.4
Utah ('05?)	19.4
Wyo.	18.6
Colo.	17.1
Nebr. ('05?)	16.8
Pa.	16.0
U. S.	15.3
Idaho	14.2
Iowa ['04]	13.8
Oreg. ('07?)	13.7
Me.	13.4
Vt.	13.0
Ohio ('08?)	11.3
D. C.	10.2
Md.	9.8
Del. ['90]	8.9
Kans. ('09?)	8.9
N. Mex.	7.4
Mo.	7.3
Tex.	7.3
La.	7.1
Fla.	6.5
Ind.	5.8
Okla.	4.2
Ky. ('08?)	2.7
W. Va.	2.4
Ind. T.	1.6
Va. ('08?)	1.6
Ark.	1.5
Ala.	1.4
Miss.	1.2
Tenn.	1.1
Ga.	1.0
S. C.	1.0
N. C.	.3

(9)

ALL PROPERTY PER CAPITA: 1900.

Nev.	4502.82
D. C.	3332.18
Wyo.	3041.49
Mont. ('07?)	2522.91
Cal.	2167.31
Ariz.	2139.54
Colo.	1738.32
N. Y.	1720.39
Idaho	1708.42
N. Dak. ('07?)	1699.47
R. I.	1658.04
Mass.	1553.78
Oreg. ('07?)	1530.41
Nebr. ('05?)	1525.09
Iowa ['04]	1509.00
Wash. ('07?)	1508.58
Utah ('05?)	1491.08
Pa.	1478.10
N. J.	1451.21
Ill. ['01]	1446.94
Minn. ('07?)	1435.21
S. Dak.	1376.43
N. Mex.	1373.64
Conn.	1319.60
Kans. ('09?)	1317.92
Ohio ('08?)	1207.20
U. S.	1164.78
Okla.	1163.12
Wis. ('07?)	1162.54
N. H.	1147.13
Del. ['90]	1146.03
Md.	1108.86
Mich.	1096.37
Mo.	1044.38
Ind.	1035.78
Me.	982.24
Vt.	960.06
Ind. T.	888.31
Tex.	761.68
W. Va.	688.00
Fla.	673.06
Ky. ('08?)	635.78
Va. ('08?)	594.50
La.	590.00
Tenn.	473.46
Ark.	460.69
Ala.	423.63
Ga.	422.32
S. C.	362.36
N. C.	360.11
Miss.	359.44

(10)

ALL PROPERTY PER CAPITA: 1904.

Nev	5214.00
D. C.	3490 63
Wyo	3297.07
Mont ('07?)	2632 56
Cal.	2582 32
Ariz	2238.94
Colo.	2045 71
Oreg ('07?)	1885.62
Nebr. ('05?)	1882 04
N. Y.	1867 70
Iowa ['04]	1828.26
Wash ('07?)	1805.60
Idaho	1794 58
N Dak ('07?)	1770.58
Minn ('07?)	1728 73
Pa.	1707 46
R. I.	1701 55
Ill ['01]	1689 12
Mass.	1672 25
Utah ('05?)	1609 07
N Mex	1587 33
N. J.	1546 63
S. Dak.	1529 58
Kans ('09?)	1467 75
Conn.	1453 47
Ohio ('08?)	1366 61
U S	1318 11
Mich.	1297 39
Wis ('07?)	1292 09
N. H.	1214 23
Md.	1212 78
Okla	1208 52
Del ['90]	1204 10
Ind	1173 73
Mo	1147 04
Me.	1095 79
Vt.	1035 06
Ind T	962 69
Tex	840 65
W Va	809 87
Fla	729 14
La	694 24
Ky ('08?)	675 11
Va ('08?)	666 15
Ark	580 48
Tenn	529 40
Ala	493 66
Ga	493 03
N C	420 16
Miss	415 62
S C	411 74

(11)

PER CENT OF ILLITERATES (OVER 10 YEARS): 1900

Iowa ['04]	2.3
Nebr. ('05?)	2.3
Kans. ('09?)	2.9
Utah ('05?)	3.1
Wash. ('07?)	3.1
Oreg. ('07?)	3 3
Ohio ('08?)	4.0
Wyo.	4.0
Minn. ('07?)	4.1
Colo.	4.2
Ill. ['01]	4.2
Mich.	4.2
Idaho	4.6
Ind.	4.6
Wis. ('07?)	4.7
Cal.	4 8
S. Dak.	5 0
Me.	5 1
N. Y.	5.5
Okla.	5 5
N Dak. ('07?)	5.6
Vt.	5.8
Conn.	5.9
Mass.	5 9
N. J.	5 9
Mont. ('07?)	6.1
Pa.	6 1
N. H.	6 2
Mo	6.4
R. I.	8.4
D. C.	8 6
U S	10 7
Md.	11 1
W Va.	11.4
Del. ['90]	12 0
Nev	13.3
Tex	14.5
Ky ('08?)	16 5
Ind T	19 0
Ark	20 4
Tenn	20 7
Fla	21 9
Va ('08?)	22 9
N C	28.7
Ariz	29.0
Ga	30 5
Miss	32 0
N Mex	33 2
Ala	34 0
S C	35 9
La	36 5

(12)

PER CENT OF NATIVE WHITE ILLITERATES (OVER 10 YEARS): 1900.

Wash. ('07?)	.5
Mont. ('07?)	.6
Nev.	.6
S. Dak.	.5
Wyo.	.7
Conn.	.8
D. C.	.8
Mass.	.8
Minn. ('07?)	.8
Nebr. ('05?)	.8
Oreg. ('07?)	.8
Utah ('05?)	.8
Idaho	.9
N. Dak. ('07?)	.9
Cal.	1 0
Iowa ['04]	1.2
N. Y.	1 2
Kans. ('09?)	1.3
Wis. ('07?)	1.3
N. H.	1.5
Mich.	1.7
N. J.	1 7
R. I.	1.8
Ill. ['01]	2.1
Pa.	2.3
Me.	2 4
Ohio ('08?)	2.4
Okla.	2.5
Colo.	2.7
Vt.	2 9
Ind.	3.5
Md.	4 1
U S	4.6
Mo	4 3
Del. ['90]	5.6
Tex	6.1
Ariz	6 2
Miss	8.0
Fla	8 6
W Va.	10 0
Va ('08?)	11 1
Ark	11.6
Ga.	11 9
Ky ('08?)	12.8
S C	13 6
Ind T	14 0
Tenn	14 2
Ala	14.8
La	17 3
N C	19 5
N Mex	29 4

(13)

PER CENT OF FOREIGN WHITE ILLITERATES (OVER 10 YEARS): 1900.

Oreg. ('07?)	4.1
Wash. ('07?)	4.5
Idaho	6.0
N. C.	6.1
Utah ('05)	6.1
S. C.	6.5
S. Dak.	6.7
Nebr. ('05?)	6.8
D. C.	7.0
Ga.	7.0
Mont. ('07?)	7.0
Iowa ['04]	7.1
Nev.	7.5
N. Dak. ('07?)	7.8
Ark.	8.0
Colo.	8.1
Wyo.	8.2
Okla.	8.3
Minn. ('07?)	8.4
Kans. ('09?)	8.5
Cal.	8.7
Ill. ['01]	9.1
Ala.	9.3
Mo.	9.3
Tenn.	9.7
Mich.	10.3
Miss.	10.7
Ky. ('08?)	10.9
Va. ('08?)	10.9
Ohio ('08?)	11.1
Wis. ('07?)	11.1
Ind.	11.4
Fla.	11.6
U. S.	12.9
Md.	13.4
N. Y.	14.0
N. J.	14.1
Mass.	14.6
Conn.	16.3
Del. ['90]	18.3
R. I.	18.7
Ind. T.	19.0
Me.	19.4
Pa.	19.9
N. H.	20.5
Vt.	21.4
W. Va.	21.5
La.	28.6
Tex.	30.3
N. Mex.	34.8
Ariz.	35.3

(14)

PER CENT OF COLORED ILLITERATES (OVER 10 YEARS: 1900.

Conn.	11.8
Mass.	12.4
N. Y.	12.8
R. I.	14.2
Vt.	15.0
N. H.	15.2
Pa.	15.3
Nebr. ('05?)	17.1
N. J.	17.5
Ohio ('08?)	17.9
Ill. ['01]	18.2
Colo.	20.0
Iowa. ['04]	20.2
Mich.	20.9
Ind.	22.6
Kans. ('09?)	22.7
D. C.	24.2
Me.	25.8
Mo.	28.0
Cal.	31.1
W. Va.	32.3
Md.	25.2
Ind. T.	36.0
Wash. ('07?)	36.0
Oreg. ('07?)	36.1
Okla.	36.3
Del. ['90]	38.1
Tex.	38.2
Fla.	38.5
Wis. ('07?)	39.6
Ky. ('08?)	40.1
Wyo.	41.1
Minn. ('07?)	41.2
Tenn.	41.6
Ark.	43.0
U. S.	44.6
Va. ('08?)	44.6
N. C.	47.6
Mont. ('07?)	48.2
Miss.	49.1
S. Dak.	51.0
Utah ('05?)	52.1
Ga.	52.3
S. C.	52.8
Idaho	53.9
Ala.	57.4
N. Dak. ('07?)	59.2
La.	61.1
Nev.	66.8
N. Mex.	71.1
Ariz.	73.6

(15)

MILES OF RAILROAD PER 1,000 INHABITANTS: 1900.

D. C.	.1
R. I.	.5
Mass.	.8
Conn.	1.1
N. Y.	1.1
Md.	1.2
N. J.	1.2
Ky. ('08?)	1.4
Pa.	1.6
Tenn.	1.6
Del. ['90]	1.9
Miss.	1.9
La.	2.0
N. C.	2.0
Va. ('08?)	2.0
Ohio ('08?)	2.1
Okla.	2.1
S. C.	2.1
Mo.	2.2
Ala.	2.3
Ill. ['01]	2.3
W. Va.	2.3
U. S.	2.5
Ark.	2.6
Ga.	2.6
Ind.	2.6
Me.	2.8
Vt.	2.9
N. H.	3.0
Tex.	3.2
Wis. ('07?)	3.2
Ind. T.	3.4
Mich.	3.4
Cal.	3.9
Minn. ('07?)	4.0
Iowa ['04]	4.1
Oreg. ('07?)	4.2
Nebr. ('05?)	5.3
Utah ('05?)	5.6
Wash. ('07?)	5.6
Kans. ('09?)	5.9
Fla.	6.3
S. Dak.	7.1
Idaho	7.8
Colo.	8.4
N. Dak. ('07?)	8.5
N. Mex.	9.0
Ariz.	12.3
Mont. ('07?)	12.3
Wyo.	13.3
Nev.	21.3

(16)

POST OFFICES PER 1,000 INHABITANTS: 1900

D. C.	.1
Mass.	.3
R. I.	.3
Ill. ['01]	.5
N. J.	.5
N. Y.	.5
Conn.	.6
Ohio ('08?)	.8
Pa.	.8
Ind.	.9
Iowa ['04]	.9
La.	.9
Mich.	.9
Wis. ('07?)	.9
U. S.	1.0
Del. ['90]	1.0
Md.	1.0
Minn. ('07?)	1.0
Mo.	1.0
Nebr. ('05?)	1.0
Tex.	1.0
Cal.	1.1
Kans. ('09?)	1.1
S. C.	1.1
Ga.	1.2
Utah ('05?)	1.2
Ind. T.	1.3
Miss.	1.3
Ala.	1.4
Colo.	1.4
Ky. ('08?)	1.4
N. H.	1.4
Ark.	1.5
Tenn.	1.5
N. Mex.	1.6
N. C.	1.6
Okla.	1.6
Wash. ('07?)	1.6
S. Dak.	1.7
Vt.	1.7
Ariz.	1.8
Me.	1.8
Va. ('08?)	1.9
Mont. ('07?)	2.0
N. Dak. ('07?)	2.0
W. Va.	2.0
Fla.	2.2
Oreg. ('07?)	2.2
Idaho	2.8
Wyo.	3.4
Nev.	4.4

(17)

PAPERS AND PERIODICALS PUBLISHED PER 10,000 INHABITANTS: 1900.

Nev.	8.5
S. Dak.	6.7
Colo.	6.1
Nebr. ('05?)	5.9
Oreg. ('07?)	5.0
Iowa ['04]	4.9
N. Dak. ('07?)	4.9
Cal.	4.8
Kans. ('09?)	4.8
Wyo.	4.8
Idaho	4.5
Ill. ['01]	4.5
Ariz.	4.4
Wash. ('07?)	4.3
Mont. ('07?)	3.9
Minn. ('07?)	3.8
Ind.	3.5
Mo.	3.4
Mich.	3.3
Okla.	3.2
Wis. ('07?)	3.2
D. C.	3.1
Fla.	3.0
Ohio ('08?)	3.0
Utah ('05?)	2.9
U. S.	2.8
N. Mex.	2.8
N. Y.	2.8
Tex.	2.7
Me.	2.6
N. H.	2.6
Conn.	2.3
Del. ['90]	2.3
Pa.	2.3
Vt.	2.3
Ind. T.	2.2
Mass.	2.2
N. J.	2.1
Ark.	2.0
W. Va.	2.0
Md.	1.8
Ga.	1.7
Ky. ('08?)	1.5
Tenn.	1.5
La.	1.9
Miss.	1.4
N. C.	1.4
R. I.	1.4
Va. ('08?)	1.4
Ala.	1.3
S. C.	1.0

LIMITATIONS OF VITAL REGISTRATION.

Accepting density of population as a very important factor in registration, the condition of the United States may be compared with other countries by means of the following table:

DENSITY OF POPULATION IN CERTAIN COUNTRIES.

Country.	Year.	Persons per square mile.
United States	1890	21
United States	1900	26
United States	1907	29
United Kingdom	1901	342
England and Wales	1901	558
Scotland	1901	147
Ireland	1901	138
British possessions—		
Ceylon	1901	141
Cape of Good Hope	1901	9
Orange River Colony	1901	8
Transvaal	1901	11
Dominion of Canada	1901	1
Manitoba	1901	3
New Brunswick	1901	12
Nova Scotia	1901	218
Ontario	1901	8
Quebec	1901	5
Newfoundland	1901	5
Jamaica	1901	152
British Guiana	1901	3
Australasia	1901	2
Australian Commonwealth	1901	1
New South Wales	1901	4
Victoria	1901	14
Queensland	1901	0.7
South Australia	1901	0.4
Western Australia	1901	0.2
Tasmania	1901	7
New Zealand	1901	8
Fiji Islands	1901	16
Austria-Hungary	1900	188
Austria	1900	226
Hungary	1900	154
Belgium	1900	589
Denmark	1901	160
France	1901	191
Germany	1900	270
Italy	1901	293
Japan	1903	317
Netherlands	1904	436
Norway	1900	18
Spain	1900	97
Sweden	1900	30
Switzerland	1900	208

While most registration countries are much more densely populated than the United States, the conditions in Australia and New Zealand would seem to be quite similar. In many cases, if the entirely uninhabited or extremely sparsely-settled territory could be deducted — a matter affecting very few people — the remainder of the area would show a considerably higher density, and perhaps one quite practicable for registration purposes. On the whole, our experience since 1895 has seemed to show that a remarkably low nominal density might yet yield fairly effective results.

In my first paper I assumed an inferior limit of density of population of about 40 persons per square mile, below which accurate registration would not be possible, or at least not practicable, under ordinary conditions. The limit that I should fix at present is somewhat below this. The superior limit above which registration comes of itself, through the mere necessities of crowded modern life, I should leave at the old figure of 100 persons per square mile, certainly until Ohio shall become a registration state.

In the prediction that I ventured to make as to the time when the United States would probably have a general system of registration of vital statistics, if dependent upon the natural progress of the individual states under conditions then existing, I set the date at about the close of the present century (1880). At that time, according to Professor Pritchett's estimate, the United States would have a population of 200,814,000, approximating 100 persons per square mile. But Hon. S. N. D. North, Director of the Census, in a recent article[1] in which he takes the declining birth rate into consideration, estimates that the population of the United States will be only 252,200,305 in 1980, 281,714,443 in 1990, and 311,857,888 in 2000. This pushes the period some fifteen years farther off, and warns us that we can not sit down supinely if we expect to see general registration spontaneously accomplish itself.

Seriously, I see no occasion to materially revise the opinion that "Even under the most favorable circumstances, however, we can hardly expect the result to come about spontaneously before the middle of the twentieth century." Sometimes I think that the movement is proceeding with an enthusiasm that may clip ten years or so from this estimate, leaving us in 1930 or 1940 with a modern system of registration that will compare favorably with that which the Japanese possess to-day. Sometimes, especially when I consider our progress in the registration of births, I feel that I was far too sanguine, and that 1950 or 1960 will be nearer the time. Until at least one state in the Union [illegible] registering practically all of its births and

[1] [illegible]

until at least one state of the South, having a considerable colored population, has succeeded in registering practically all of its deaths, we shall have no basic material upon which to make reliable predictions. Only the time seems mighty slow a-coming, and it must add to the gaiety of foreign nations to see us make such a tremendous long-drawn-out fuss about what is to them a very simple little administrative problem. They do not understand laws that are not obeyed.

MEANS FOR HASTENING THE ADVENT OF ACCURATE REGISTRATION.

We should utilize, in the first place, the results of municipal registration of vital statistics in the United States.

This has been done by the Bureau of the Census, so far as any results were available permitting satisfactory use. Some returns from cities are most carelessly made, and it is doubtful whether certain cities now forming part of the registration area properly belong there. A general attempt will be made to improve the character of such returns, and to secure more cities in non-registration states from which returns can be received. But municipal registration of vital statistics, without an underlying basis of state law, is at best an uncertain affair.

Another way in which the advent of general registration may be hastened is the prevention of retrograde action on the part of the states in relation to the subject of vital statistics, and the securing of the adoption of a satisfactory registration law by those states that have advanced sufficiently in density of population to guarantee its successful administration. The essentials of modern registration should be clearly presented to the medical profession and the general public, so that the appalling ignorance that not infrequently appears when the subject comes up in state legislatures would be less in evidence.

The essential principles underlying laws for the registration of deaths have been worked out by the former Committee on Demography of this Association in conjunction with the Bureau of the Census and forms of laws based thereon have been the foundation of most of the successful statutes enacted. Special pamphlets have been prepared by the Bureau of the Census for this purpose and widely distributed, and others are planned or in course of preparation. The list up to date is as follows:

No. 71. (Circular) Registration of Deaths.
No. 100. Legislative Requirements for Registration of Vital Statistics.
No. 101. Practical Registration Methods.
No. 102. Relation of Physicians to Mortality Statistics.

No. 103. Medical Education in Vital Statistics.
No. 104. Registration of Births and Deaths. Drafts of laws.
No. 105. Statistical Treatment of Causes of Death.
No. 106. Extension of the Registration Area for Births and Deaths.
No. 107. Modes of Statement of Cause of Death and Duration of Illness.

There is, fortunately, a way by which the interest of this Association in the improvement of our state registration systems may be readily manifested, and by which good results may probably be secured. The boards of commissioners appointed by many of the states to bring about by voluntary state action, greater uniformity in the statute laws prevailing in the different states and territories, are working exactly in the direction which any movement for a general registration system in this country must take. They have already recommended important legislation relating to marriage and divorce; their hearty support of measures looking toward uniformity in the registration of births and deaths in the several states cannot be doubted. It only remains to exhibit fully the importance and essential requirements of such registration in order to enlist the services of this very influential organization in the cause of improved vital statistics, and I hope that the American Public Health Association will at this meeting appoint a committee to memorialize the boards of state commissioners, through their national conference, to this effect.

So impressed was I at the time with the importance of doing this that I introduced the following resolution, which, however, failed to pass:

Resolved. That a committee of the American Public Health Association be appointed to present to the board of commissioners appointed by certain states to promote greater uniformity of statute laws, the importance of uniformity in the methods of registration of births and deaths in the several states of the Union.

We have suffered for some twelve years, however, by failure to take action at this time. You will be glad to know that the matter of enlisting the aid of the commissioners on uniform state laws was taken up by the Conference of the Governors last year and that their recent conference held at Portland, Me., on August 22, 1907, cordially adopted a resolution providing for a committee to enter upon the drafting of uniform laws for the registration of births and deaths. A similar resolution was adopted by the American Bar Association.

Again, the [illegible] of the United States Census relating to [illegible] vital statistics should be encouraged and [illegible] important [illegible] census method has long been [illegible] to vital statistics. It would be well if [illegible] centers also aided in the collection of the vital

data for the census of 1900, and be replaced, as far as possible, by approved methods.

I have great pleasure in announcing, by the express authority of the Director of the Census, and this constitutes the first public announcement that has been made, that the method of attempting to *enumerate* vital statistics has been entirely omitted from the plans now preparing for the Thirteenth Census to be taken in 1910. We have thrown away our crutches, and if we can not walk, we must fall. We shall depend exclusively, hereafter, upon *registration* returns, and shall not endeavor to supplement them, or replace them, by enumerators schedules. We shall not even attempt to use enumerators returns to check up the accuracy of registration, and thereby to determine whether a state is or is not entitled to admission to the registration area. During the past year we have tested other methods, and, as they have proved, much more satisfactory ones, for this purpose. We shall not fail. We shall cease to publish worthless, or nearly worthless, data for certain areas, and the immediate result should be a greatly increased determination among the various non-registration states to raise their standard of efficiency, by the adoption and enforcement of proper laws, so that they may not be *unrepresented* in the national vital statistics.

For many reasons it is desirable that there should be a permanent census establishment, both on grounds of economy and improved service. The machinery of a great census should not be entirely dismantled when the period of its immediate activity is over, but it should be reduced to a peace footing for a time, during which extended investigations and the preparation for sudden activity could go on quietly and economically; then when the date of the census arrives, there would be a staff of trained experts to serve as officers in the army which is raised so rapidly, goes into action with such intensity, and which is disbanded about the time that its duties are fully learned under the present system.

All of this has now come to pass, and in my presence here as the representative of the permanent Bureau of the Census, I need not assure you of its earnest desire to co-operate with this Association, with the new Section of Vital Statistics, whose formation I had the honor to recommend to you last year as essential to the progress of American vital statistics, and with the individual registration officials, both state and municipal, who are charged with the duty of collecting the original returns.

WHAT HAVE WE ACCOMPLISHED SINCE 1895?

Not very much, when we consider what still lies before us to do before we shall have, as Doctor Harris hoped in 1877 we should soon

have a system of registration of vital statistics worthy of a great nation. Let us recall his words and consider whether he set the mark too high and beyond the bounds of reasonable achievement:

> **Before the national census of 1880 is commenced, all of the states ought to have a good system of vital statistics organized and in harmonious operation, contributing comparable and numerically complete results. . . . ANOTHER DECADE OF NEGLECT TO ADOPT AN EFFECTUAL SYSTEM OF REGISTRATION IN THE UNITED STATES WOULD BE GREATLY TO THE DISCREDIT OF THE INTELLIGENCE AND PUBLIC SPIRIT OF AMERICAN CITIZENS.**

Was it ready by 1880? No, nor by 1890, nor by 1900; nor will it be ready by 1910, nor does it seem likely to be by 1920; nor, at the rate at which we are progressing, with not a single state or city in the Union yet admitted as a nucleus for the registration area for births, deaths, and causes of death, can we even predict the probable year in the twentieth century when the United States shall take an honorable place in the assembly of nations which believe that the registration of the vital events of their citizens is a necessary function of [illegible] enlightened and progressive [illegible]

We have [illegible] all things [illegible] only they would stay as [illegible] we contemplate them. You know that the registration [illegible] considerably extended since 1900, yet [illegible] work in the systems of several states in the [illegible] to issue formal "permits," which, [illegible] efficiency. A standard certificate [illegible] by the American Public Health Association [illegible] and systems employed with resulting advantage [illegible] the data collected, yet many states [illegible] their old forms, whose variety is [illegible] all others that have "adopted" [illegible] materially change it, without [illegible] that the information [illegible] what it purports to be [illegible] the actual standard [illegible] special pamphlet pre[illegible] of the United States [illegible] Association with the hope [illegible] resulting from arbitrary

[illegible] Death and

changes in what should be a uniform national form will result in closer adherence to the accepted standard.

The most important action that the American Public Health Association has ever taken in regard to vital statistics was when it finally adopted at Ottawa in 1898 the resolutions introduced by the Committee on Demography at Philadelphia in 1897 in regard to the International Classification of Causes of Death (then known as the Bertillon system). While the delay of a year cost it the honor of priority, the system having been first indorsed by the Conference of State and Provincial Boards of Health at Detroit in 1897, the resolutions finally passed by this Association gave the final impetus which determined the general acceptance of this system throughout the entire Western Hemisphere, as well as in certain countries of Europe and Africa; in Japan, and — I need not tell you with what pleasure and delight I make this announcement —the new Commonwealth of Australia. I hold in my hand a pamphlet recently published by the Commonwealth Bureau of Census and Statistics of Australia, Hon. G. H. Knibbs, F. S. S., etc., Commonwealth Statistics, from which I make the following extracts:

The adoption of a classification not only more closely conforming to recent advances in nosology, but one which also renders possible a much wider field of comparison than any existing index in actual use in this country, is an essential in attaining any marked improvement in the statistics of disease and death in Australia.

The nomenclature of diseases and causes of death, as revised and adopted in the year 1900 by the International Commission [the original proposition for which was made by the American Public Health Association] charged with a revision of the earlier nosological nomenclature, provides a classification which, better than all others, meets the requirements indicated.

At a statistical conference, in which every State of the Commonwealth, the Commonwealth itself, and New Zealand were represented, the adoption of this nomenclature was unanimously approved, and, in order to facilitate its application, the translation of the work above referred to was undertaken in the Commonwealth Bureau of Census and Statistics, and is now published for general information.

* * * *

The value of a comprehensive nosological nomenclature or index, by means of which diseases and causes of death may be so classified as to facilitate comparisons of the vital statistics of many countries, is sufficiently obvious to need but mention. This value depends mainly upon two elements, namely:

(1) The range of its acceptance; and

(2) Its scientific accuracy.

In regard to the former it may be observed, that the adoption of the classification of Dr. Jacques Bertillon, the distinguished chief of the statistical department of the city of Paris, will render possible

a wider range of comparison than any other existing index. This alone gives it a large claim to consideration.

With respect to the latter element, it will be sufficient to say that, notwithstanding any scientific limitations by which it may be characterized, from the standpoint of the nosology of to-day, the 1900 edition of the Bertillon classification will fulfil its object up to the time when it is proposed to revise it (viz., 1910), sufficiently for all practical purposes, and with the advantage already referred to.

[illegible] recent conference of statisticians, at which the Commonwealth, New Zealand, and each State of Australia was represented, it was decided, after careful consideration, to recommend this classification for adoption. In making this recommendation the statistical conference was guided mainly by a recognition of the signal advantages of a classification which made possible a wide comparison of statistical results. It was also considerably influenced by the fact that a special statistical committee of the Australasian Medical Congress [illegible] their last conference, Dr. W. Perrin Norris, expressed the view that the question of adopting the Bertillon classification was worthy of serious examination.

The considerations which, in other countries, have led to the adoption of the Bertillon classification in European and American countries are so ably set forth in the introduction to the revised edition of 1900, that not only is a translation given in full, but reference is also made to the opinions of the committee which secured its adoption in the United States, Canada, and Mexico.

* * *

As an evidence of the appreciation of the system in America, to which reference has been made, the following extracts from the proceedings of the American Public Health Association are considered worthy of [illegible] [Here follow extracts from proceedings of 1898.]

* * *

From the foregoing pages it will be seen that the classification adopted by the International Commission has been adopted in many countries. What remains [illegible] particularly interest Australia, however, seeing that [illegible] well. Uniformity conditions are of the greatest value [illegible] the fact of its almost universal adoption in America. The [illegible] classification does not claim to perfect [illegible] [illegible] The possession of a decennial revision makes it [illegible] classification will be kept [illegible] abreast [illegible] [illegible] all practical purposes. This [illegible] Australasian Medical [illegible] [illegible] Bertillon classification gives [illegible] the Conference [illegible] Melbourne in November [illegible] [illegible] to remit [illegible] the preparation of [illegible] Commonwealth of Australia and in New Zealand.

The translation following hereinafter has aimed at being purely literal, and while the "Nomenclature of Diseases drawn up by a joint committee appointed by the Royal College of Physicians of London, 1896," was not overlooked, and some slight use was made thereof, it could not be allowed to influence the classification without defeating its primary object.

I hope this action will be as inexpressibly gratifying to you as it is to me, giving fresh encouragement to the movement, which now *shall* succeed, for universally comparable statistics of causes of death. Your action in 1898 suggested the international commission; it determined the acceptance of the system by some wavering European countries, and, I believe, by Japan; it secured Costa Rica, Brazil, and perhaps other countries of Central and South America. It caused the United States Census Office upon the recommendation of my predecessor, Mr. William A. King, to adopt the international classification for the first year of the annual Mortality Statistics, beginning in 1900; and every registration state in the Union and *nearly all* of the registration cities have followed suit. But it is an unfortunate fact that many offices nominally using or attempting to use the international classification take liberties with it, both with respect to actual form and also as regards the inclusions of titles, so that the statistical results are sometimes far from comparable. It is better not to use it at all than to partly employ it and induce statisticians to make use of figures that are not properly compiled thereunder.

ARE YOU SATISFIED WITH PROGRESS?

Important as they are, questions of forms of statistics are comparatively trivial beside the question of whether we shall have any vital statistics at all for the United States as a nation. The whole nation, not a little stretch of it here and there. Whether the births and deaths of all Americans shall be *registered*, as are those of human beings in all civilized communities except the United States, or whether the U. S. Commissioner of Pensions must rely, for example, as he was actually compelled to do in a certain case, for evidence as to the date of birth of the child of a deceased soldier, required for pension allowance, upon the date of birth of the foal of a celebrated race horse; the animal's birth was recorded, while the child's was not! Do you believe in the necessity of such registration, not merely for what sanitary uses you make of it, but as a matter of self-respect and legal importance to our people? *Do* you believe in it?

I presume I c l t t ua v
of this Association as the

statistics for sanitary purposes. I presume you would assent to the following resolution, which is substantially that adopted by the Associated Health Authorities and Sanitarians of Pennsylvania in 1904, the year before the passage of the present effective registration law of that state. The provisions of general application are as follows:

Whereas, The accurate registration of vital statistics is an indispensable requisite of an efficient modern public health service, and

Whereas, The Congress of the United States, by joint resolution, has called upon the authorities of the various states to cooperate in establishing such registration; therefore be it

Resolved, That the achievement of the registration [of all births and] of all deaths, with their causes, immediately after their occurrence, and the prompt return of certificates from local registrars to the central bureau of vital statistics, thereby giving the sanitary authorities of the state timely information of the exact prevalence and distribution of disease, IS THE MOST IMPORTANT OF ALL SANITARY MEASURES AND SHOULD BE UNREMITTINGLY URGED UNTIL SUCCESSFULLY CARRIED OUT IN EVERY STATE OF THE UNION.

Then why not do it?

I am afraid that much of the talk of the importance of vital statistics is merely academic and perfunctory, even in the American Public Health Association. Official representatives of the various state and city sanitary services—many of them with very imperfect or no registration of deaths, and none of them with satisfactory registration of births—will come to these meetings year after year, and deal with every other sanitary question conceivable except vital statistics, in a way that means business. It is of no use merely to talk about lack of registration and deplore it, unless we can *do* something. But we have never really tried to do anything, with well-organized, persistent energy. We have talked, and talked, and talked,—and two years ago the Association became so weary of talking over the subject, or perhaps it was thought that the subject was exhausted, that the regular Committee on Demography was dropped and vital statistics were left entirely out of the program. Perhaps it did us good, for we have come back to you with a Section on Vital Statistics this year, and many registration officials are in attendance who have never heretofore participated in your councils. We have organized to *do*, but before we proceed, we must know whether the American Public Health Association really believes that this is the important, and the *most important* single object to which the efforts of sanitarians should be devoted.

Vital statistics is the Cinderella of modern public hygiene. She sits in the chimney corner and sifts the ashes of dusty figures while her proud sisters, Bacteriology and Preventive Medicine, go to the ball and

talk about the wonderful things they have done. But the Prince's slipper fits no other foot, and when we descend to facts, and not mere empty bombast, about the results of administrative work, vital statistics, and accurate vital statistics, are our sole dependence. What do we know about infant mortality, which we are all so anxious to prevent, when not a single state or city in the United States has the data for a correct statement; it depends upon the accurate registration of *all* births. What do we know about the real incidence of tuberculosis while health officers, acting as local registrars, allow deaths to be reported in such a way that many of them can only be classified, and studied for practical sanitary purposes, as "Probably tuberculosis" and "Possibly tuberculosis." See "A Statistical Study of Tuberculosis in Philadelphia" in the first Annual Report of the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis. The amazing thing about the way in which many deaths from tuberculosis are reported, as "Abscess of chest," "Brain fever," "Marasmus," etc., is the general indifference of registration officials to the necessity of securing accurate statements of causes of death. I sometimes think that the cause of registration has lost more than it has gained by being tied up, in this country, to public health work. Pure food, registration of physicians, osteopaths, and embalmers, inspection of milk, laboratory work, prevention of tuberculosis, sewage, water supplies, and a hundred other matters seemingly of more pressing importance and more fruitful of "practical" results, distract the attention of the administrative health officer from his registration records, whose compilation he is quite likely to turn over to the janitor or messenger; not that a janitor may not develop into a faithful statistical clerk, but he is not likely to possess that medical knowledge which is indispensable for the proper treatment of causes of death. Every fad seems to have the preference, and I am not certain of my reply when I ask you if you really believe that vital statistics are *indispensable* to a modern public health service, and whether you think that it would be wise to direct all the energies of this Association toward bringing about the proper registration of all births and deaths in the United States.

Do you want a thorough system of registration of vital statistics for the United States?

Do the people of the United States want such a system? If they do, they can have one, and very promptly. It will not be necessary to wait fifty or sixty years for the slow adoption and enforcement of adequate laws. The process can be hastened, and without departing from the constitutional requirement that the primary control of registration shall be by the states and not by the Federal Government. If

Congress, if the *people* of the United States were really interested in this matter, and were determined that this thing should be done, the states would readily be brought into line. But I am not even sure that the American Public Health Association would give its undivided and undistracted support to this *indispensable* (theoretically) object, and while practical users of vital statistics are disposed to tolerate present conditions, the people and their legislative representatives may be pardoned for neglecting them.

THE SOURCES OF ERROR IN BACTERIAL DIPHTHERIA DIAGNOSIS.

H. W. HILL, M. D.

MINNESOTA STATE BOARD OF HEALTH LABORATORIES, MINNEAPOLIS, MINNESOTA.

However much we may wish to have perfect methods and machinery, it is not within human scope to secure them. The most perfect mechanical device is subject to a certain amount of slip, wear, and loss of rigidity. Even a 9000-pound metal-turning lathe, with its great mass of bed, intended to give absolute inflexibility, can at best be regarded as an immensely stiff spring, subject to compression and contortion, yielding to the strains put upon it — strictly speaking, non-rigid, although specially designed to be as rigid as massive steel can make it. Admitting this he who cheerfully ignores the inevitable defects of his machine, will sooner or later find that his minutely calculated plans somehow do not result in satisfactory finished products. But the mechanic who knows the errors of his machine can allow for and correct to some extent defects in operation, and his results reach just so much the closer to the ideal.

The bacterial diphtheria diagnostic service of the present day is a machine — built of human manipulative skill and mental processes. It is subject to slip, wear and loss of rigidity. It is applied to the solution of complex biological problems — problems which nature has been composing at leisure for æons, and which our machine is to meet and vanquish in minutes. It is my task to set forth certain defects of the machine, not in order to condemn the machine, but to show how they may be allowed and corrected for in practice. I am aware that no protest of mine will avoid the impression reaching some minds that the setting forth of defects is a condemnation — an admission of weakness. As a matter of fact, the setting forth of defects which exist is the one way of eliminating them if that be possible or obviating their results if they cannot be eliminated.

Ten years of intimate acquaintance with diphtheria diagnosis involving personal examinations totaling between 60,000 and 70,000 has resulted in many disillusions, but has left me convinced that the machine, with all its faults, is capable of remarkably good work, immensely superior to that of unaided clinical diagnosis in general practice. I am convinced from the study of my own statistics and

those of others that the presence in affected throats, etc., of the bacilli is 98 to 99% conclusive of the presence of the disease; that the absence of the bacilli is quite conclusive of the absence of the disease; and that the absence of the bacilli can be demonstrated by one culture with an accuracy of 90%, with two cultures, of 99 and a fraction percent. What clinical medical or surgical test have we that approximates an average of as much as 75% accuracy? Even autopsies are not as conclusive diagnostic agents in general practice as is the diphtheria diagnostic service in diphtheria. The sources of error which I shall discuss are those which appear in a total of perhaps 5% of all cases examined. Most of them are technical and can be eliminated by care and skill. The irreducible minimum of error, due to our ignorance or lack of control of nature, is not over 1 to 2 and it is to these small fractions of the total that I shall address myself.

In the attempt to give this address logical sequence and compactness I will assume that the diphtheria diagnostic service under consideration consists of the usual mechanism:

1st. A patient.
2nd. An attending physician.
3rd. A collecting outfit supplied by the laboratory, consisting of a sterile swab, a tube of serum, and proper identification blanks.
4th. A laboratory where the examinations are made upon the specimens submitted by the physician.
5th. A system of reporting results to the physician and to the executive officer.

The essential features of the operation of this mechanism are:

1st. The collection by the physician of a satisfactory specimen.
2nd. A proper technical examination and report to the physician and to the executive office.
3rd. An identical interpretation of the report both by the physician and the executive office.
4th. The taking of executive action on the basis of this interpretation.

[illegible] of error correlate directly with these, and may be similarly grouped.

If the physician is a home-made article or one which has been spoiled [illegible] careless handling, if he does not rub the swab thoroughly on the proper area of tube to transfer the swab to the serum, if he [illegible] before, and [illegible] dry or attempt to incubate it himself [illegible] the laboratory, the specimen will not be a success. We have all had experience with [illegible] been told of instances where the physician used serum [illegible] were [illegible] with [illegible] completely liquefied, where he rubbed the swab on the serum first and then on the throat, where,

in an excess of antiseptic enthusiasm he swabbed the throat well, and then before rubbing it on the serum, carefully charred the swab-cotton in a flame. We all know the home-made swab — a piece of cotton, generally asepticized, rolled on a match, thrust bodily down into the serum or sent rolled up in a piece of newspaper. We all have seen specimens properly packed and shipped, but giving no name or address to which the report can be sent. Sources of error of this nature are obvious.

SOURCES OF ERROR WITHIN THE LABORATORY.—ADMINISTRATIVE.

1st. Mixing up or confusing two specimens, either at time of receipt, in manipulation, at the time of examination, or in the reports.

2nd. Losing a specimen bodily, or allowing it to lose its identity by defacement of the label or otherwise.

3rd. Breaking or otherwise destroying a specimen.

4th. Neglecting some part of the necessary technique — failing to incubate, to make a smear, to stain or to examine.

5th. Failure to report the findings, or reporting them incorrectly.

6th. Failure to transmit the reports to the addresses given, or reporting Dr. A's patient to Dr. B. and *vice versa*.

A consistent system of checking upon every stage of the manipulations from the receipt of a specimen to the sending out of the final official report is the only remedy for such accidents. The simpler the system, the less the liability to error. One such error in 20,000 examinations is quite enough.

SOURCES OF ERROR WITHIN THE LABORATORY.—TECHNICAL.

1st. The greatest technical error which the bacteriologist can make is *denominating as B. diphtheriae an organism which is not B. diphtheriae*: In brief, the general rule that only A. C and D types of the diphtheroid group should be reported as positive will be found to hold good. Other forms should be reported as negative, or at most as atypical. A complete account of what the writer believes to be the best practice in this regard is given elsewhere. (Am. Journ. Pub. Hyg. May, '07.) Mr. B. R. Rickards called attention in a paper before the section yesterday to certain modifications in rare cases noted as a result of some recent findings in his laboratory.

Of the non-diphtheroid group, the chief source of error for the experienced expert is what we have called in laboratory slang the "dust bacillus." This is an organism which typically is far too large and regular to give rise to error. But aberrant forms smaller than usual, and more irregular, bearing metachromatic granules also, will at times puzzle the most expert. In such cases a doubtful report should be made.

2d *Failure to report diphtheria bacilli when they are present.* This may be a matter of simple oversight, the diphtheria being few, scattered or obscured by other organisms. At times it seems impossible to avoid such oversight. I have personally known of cultures, reported negative after careful examination, by the ordinary smear method, made especially to search for even the smallest types, which on inoculation into guinea pigs, killed the pigs, yielding typical lesions, the diphtheria bacillus being recovered from the site of inoculation. Not infrequently, after a smear has been examined and pronounced negative, a second examination has shown diphtheria bacilli overlooked in the first examination. It has been my practice to examine every smear twice, marking the cavities between the first time and then reviewing all very carefully. Where it is possible all smears should be examined by two different persons, the one who examines first usually examining second the most. Nothing excepting careful examination of smears as well as the keeping in mind that the examination may be reviewed by someone else can prevent errors. In cases where agreement cannot be reached, the culture should be reported doubtful. In order to reduce the chances that the organisms will be few and scattered in a smear, two smears may be made from each tube or what is better in practice a single very large smear made after drawing the needle all over the surface of the tube.

3d *Failure to report diphtheria bacilli when they are present with other bacteria not stained by* [illegible] The most difficult of the cases to deal with are those which liquefy the serum. Sometimes these are introduced into the culture by the patient, the latter having chronic nasal or throat infection, and then [illegible] Not infrequently they are found in the throat of the patient and in such cases the history of the case [illegible] the organisms usually in the throat appear. I have seen at least [illegible] in the same patient or cases [illegible] in such a manner that [illegible] the throat of that patient [illegible] with [illegible] Sometimes [illegible] these cases [illegible] Many times [illegible] a negative [illegible] diphtheria [illegible] has been present in [illegible] with [illegible] are expected [illegible] the most commonly used and

seldom occurs for any reason other than that the serum has been allowed to dry out. No throat is ever in so sterile a condition that a good tube inoculated properly from it fails to give growth of some kind. It is conceivable that the very recent use of a strong antiseptic in a throat might, not by killing all the organisms in the throat, but by transference of some of the antiseptic to the serum tube on the swab, result in "no growth" but in practice this very seldom happens, if ever. Hence a "no growth" simply shows that the tube was not inoculated, or being inoculated, the organisms did not find the food suitable.

SOURCES OF ERROR IN REPORTING.

The chief error here lies in the giving of a wrong impression to the physician. I am very strongly of the opinion that the report itself should state in set terms nothing but the actual findings. The interpretation of all findings should be noted, for the physician's use, on the back of the report. The four forms of report which cover all contingencies are:

1. *B. diphtheriae* present.
2. *B. diphtheriae* not found. (It should not read "not present," or "absent", for this may not be true.)
3. Atypical organisms only found. Please submit another culture.
4. Culture unsatisfactory. Please submit another.

In the case of unsatisfactory cultures it is well to say what was the matter, such as dry tube, liquefied serum, contamination, mold, no growth, etc. A report should not be rendered in such form as to state without qualification that the results show the presence or absence of the disease of diphtheria. We all most sincerely wish that this might legitimately be done — that *B. diphtheriae* present might really mean the presence of the disease, *B. diphtheriae*, not found, the absence of the disease. If only this were true (as I think the earlier bacteriologists must have believed) all would be well. Unfortunately no such direct interpretation is possible. There are conditions under which the presence of the bacilli of *B. diphtheriae* do not indicate the presence of the disease diphtheria, and also much more frequently occurring conditions under which the failure to find diphtheria bacilli *does not* indicate the absence of the disease. Of course doubtful or unsatisfactory results afford no information at all and mean nothing whatever as aids to diagnosis.

SOURCES OF ERROR IN INTERPRETATION.

These are the most serious sources of misapprehension and error; leading to confusion, misunderstanding, and sometimes to unjust com-

dermatologists of the system and every one connected with it, physicians, bacteriologists and health officers.

Let us assume that in a given case a culture has been sent to the laboratory and a positive report returned, that no technical errors have occurred at any stage and that the report of *B. diphtheriae present* is wholly correct.

Primarily such a positive report fixes but one thing — the presence of *B. diphtheriae* in the patient's throat, nose or wherever it was that the culture was taken from. It is from this one fixed point supplied by the laboratory that the physician must arrive at his decision, by correlation with that point of all the other available data clinical and otherwise that is at hand.

To begin at the beginning, the disease of diphtheria is not caused by the mere physical presence of the bacilli of diphtheria as such, but solely by the toxins which the bacilli generally — but not always — produce. If the diphtheria bacilli found in any given case are non-toxic, their presence [illegible] significance than the presence of any other bacteria [illegible] significance whatever as regards the diagnosis of the disease. If on the other hand, the diphtheria bacilli are toxic, it must be remembered that the body forces are able to neutralize toxins to a greater or lesser extent in different cases and that therefore even the presence of toxin producing diphtheria bacilli does not by itself [illegible] of the disease of diphtheria. The [illegible] can exist with at [illegible] and the toxins are all [illegible] [illegible].

[illegible] which I believe to be actually [illegible] the body to that point at the specific [illegible] only when [illegible] diphtheria bacilli [illegible] the body to [illegible] the toxins [illegible] have [illegible] that there re[illegible] over it. Hence, if diphtheria [illegible] a [illegible] the [illegible].

[illegible] the presence and

activity of the toxins and hence the presence of the disease? The days when this could be answered by the statement that a membrane indicates diphtheria, and the absence of a membrane no diphtheria, are long past. Indeed, if this simple differential sign were reliable, there would be no further need of bacterial diagnosis. We know that a membrane may occur in the absence of diphtheria and diphtheria bacilli; that true diphtheria may be present without a typical membrane or even without a membrane at all. Nor can we determine the clinical symptoms of diphtheria as concisely as the physician did who decided the question so far as he was concerned, thus — the cases that died were diphtheria, the cases that recovered were not. As a matter of fact, study has shown that cases of diphtheria of all shades of clinical development occur and that therefore, while typical cases often leave little room for clinical doubt, early or atypical cases give little of distinctiveness in the pulse, temperature or condition of the throat. Hence it becomes logical and proper to assume that any variety of such disturbances combined with the presence of the diphtheria bacilli is so probably the disease of diphtheria that no one can be justified in regarding it otherwise.

To put this in brief logical form — the presence of clinical symptoms affecting pulse, temperature and throat indicate the presence of toxins of some kind: the presence of diphtheria bacilli make it almost certain that these toxins or some of them are those of the diphtheria bacillus. A really final diagnosis could of course be made by waiting for fully developed symptoms, autopsy and especially the spread of the disease to others in typical form, but it will usually prove better for all concerned to make the assumptions here outlined than to demand proof of such finality before taking action. At the same time it must be freely granted that symptoms, indistinguishable from mild or atypical diphtheria, due solely to streptococci, staphylococci or other organisms, may co-exist in a throat with non-toxic diphtheria bacilli or with toxic bacilli, the toxins being wholly neutralized by the body. In such a case, the assumption above, i. e., that diphtheria bacilli plus symptoms predicate the disease, while justified by the available data at the moment would nevertheless be in fact wrong. In practice there is evidence to show that such cases do not exceed 1% to 2% of the total number of cases (sick) diagnosed as diphtheria by the microscope.

If diphtheria bacilli are found in the throat of a person having no clinical lesions, that patient cannot have the disease of diphtheria, for if there are no lesions, there can be no disease. It is well known that approximately 1% of well people carry the bacilli (usually non-virulent

forms) that of those exposed to the disease, a certain number are likely to become infected, without becoming sick; and that finally, a culture may be taken so soon after a person becomes infected that the disease, to appear later, has not yet developed.

Hence it will be seen that the real function played by the finding of diphtheria bacilli in public health practice is to make proper the assumption that the individual concerned is infected with a dangerous organism; if the individual has clinical symptoms, to make proper the assumption that he has the disease; but chiefly in both cases, the function of a positive report is to convert the burden on the health officer of proving the presence of the disease or the infectiveness of the patient to a burden upon the physician of proving that the patient has not the disease, or is not infective.

The failure to find diphtheria bacilli in a culture from a patient, assuming as before good technique in all stages, does not prove anything with finality. From what has been already said the chances of finding the bacilli when present in the throat, are such that all summed up in ordinary routine practice in throats containing diphtheria bacilli, a single attempt to find them will fail in from 5% to 10% of cases. If a second culture be taken on that 5% to 10%, the chances of failure are reduced to a small fraction of 1%, but I have personally found diphtheria bacilli on the third and at least once on the fourth examination, the earlier examinations proving negative. Moreover, in doing large number of specimens, it has been at times almost a weekly occurrence to have two cultures taken by two different physicians from the same patient within a few hours or even minutes of each other prove one positive, the other negative. When such results occurred the inference is that one or the other physician used a poor technique, or that the diphtheria bacilli were in truth few and scattered in the throat, so that the best technique would stand a chance of failure.

In such cases the positive culture should overrule the negative, and, in reporting the negative to one physician, his attention should be called to the positive obtained by the other as completely offsetting his negative. For the same reason a positive from any one laboratory in good standing should offset a negative result of any other laboratory. This is strictly just and fair to all concerned, because it is based on the [illegible]

[illegible] relates to the diagnostic part of the service. The [illegible] sources of error occur in the release work. But certain [illegible] are exaggerated in release, because the condition of the throat [illegible] negative is afforded to the physician as to the best [illegible] the swab, since membrane and inflammation have by that

time disappeared. The physician is apt to be less thorough in release cases, because his anxiety concerning the patient is all over, and he now cares chiefly to close up the case. Unconsciously this is likely to affect his technique. Of course there are black sheep in every fold and physicians sometimes send release cultures from areas other than those recently infected. Moreover, the most painstaking and conscientious culture taker has a more difficult task in release than in diagnosis for the bacilli are fewer, more scattered, and at times are confined to the crypts of the tonsil, the mouths of the pharyngeal glands, folds of mucous membrane, etc., those on the free surfaces being removed mechanically in the act of swallowing. The relative fewness of the bacteria makes the bacteriologists' task more difficult also and as a sum total result, the error from the negative side (i. e., in reporting as negative, cultures which ought to be reported positive) rises from the 5% to 10% found in diagnosis to an average of 30% in release. The error on the positive side in release is however practically nil, for organisms found in the throat of a patient recovered from diphtheria are practically always virulent and dangerous.

In the reporting of release cultures it is fallacious to report diphtheria present, or any other phrase which would imply that the disease still exists. If the patient has recovered, he is not suffering from diphtheria and the form of the report should be, as in the diagnostic reports, such as will merely state the presence of or the failure to find the bacilli.

SUMMARY.

As a final summary I submit the following attempt to outline what is actually proved and what must be assumed to make bacterial diphtheria diagnosis a logical and fully practical success:

1. The finding of diphtheria bacilli in a culture proves, taken by itself, nothing except their presence in the culture.

2. If the culture was properly taken, and handled, the finding the bacilli proves their presence in the throat, etc., from which the culture was taken — nothing more.

3. The presence of the diphtheria bacilli in the throat plus appropriate symptoms (inflammation, exudate, or membrane, with affections of temperature and pulse as a minimum) justifies the assumption that the patient has the disease; the evidence being that 98% to 99% of all patients showing this combination have the disease.

4. The presence of diphtheria bacilli in the throat, without symptoms, requires further data as to exposure. If clear history of absence of exposure can be obtained, it is legitimate to assume that the diph-

theria bacilli found are likely to be non-virulent, the evidence being that 80% of such cases are not virulent. If exposure is established, the legitimate assumption is that the diphtheria bacilli are virulent; and therefore that the person may infect others, or come down shortly with the disease; the evidence being that the bacilli obtained from a clinical case are almost invariably virulent

5. The failure to find diphtheria bacilli in a culture, is about 90% conclusive of their absence in the throat. If a second culture be taken, and also prove negative, the two consecutive negatives taken together afford about 99% conclusive evidence If a third or fourth negative be obtained, the absence of diphtheria bacilli is established with practically finality.

In conclusion, I would like to add that direct examination of the swab taken from a patient's throat, without transfer to serum, will detect the presence of the bacilli in about half the cases that the serum culture would detect them, and since, in the half where they can thus be found, 15 to 24 hours is saved in securing the report, such examinations are well worth making The organisms found in a swab are not quite identical in appearance with those found in cultures, and no one should attempt the direct swab method, however familiar with the cultural method, until some hundreds of swabs have been examined and the results compared with the corresponding cultures

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DIPHTHERIA IN THE STATE OF JALISCO, MEXICO.

DR. ADOLFO OLIVA, GUADALAJARA, MEXICO.

For some years past diphtheria has assumed in Guadalajara and in all the state of Jalisco a truly epidemic character.

Corroborating the observations of the greater number of scientific men who have studied this terrible disease, I have to state that in the city of Guadalajara, diphtheria has its victims chiefly among children of from 3 to 8 years old, of which my personal observation shows the greater number to be females.

As in Europe, the disease develops more particularly under the influence of wet cold weather and of the constant oscillations in temperature. My observations show that the periods of greatest recrudescense of diphtheria, have taken place in Guadalajara during the months in which the above mentioned conditions concur.

In order not to fatigue the attention of this learned assembly, I cheerfully submit to its deliberations the propositions below expressed, which are deducted from the ideas contained in this work of mine.

1st. In the state of Jalisco, and more particularly in the city of Guadalajara, diphtheria has assumed a most marked epidemic character.

2d. The prophylactic measures put into practice, and the application of the antidiphtheritic serum of Parke Davis, Mulford, Roux, etc., have resulted in a decrease of mortality by diphtheria during the first half of the present year.

3d. The same serum applied in immunizing doses, decreases in a most notable manner the cases of diphtheria.

4th. The treatment of post-diphtheritic paralysis by the application of antidiphtheritic serum, gives positive results.

In the city of Guadalajara, as well as throughout the state of Jalisco, diphtheritic infection has a predilection for children 3 to 8 years of age, the greater number of these being females.

CONTROL OF THE MINOR INFECTIOUS DISEASES.

A. G. YOUNG, M. D.

Secretary, State Board of Health of Maine.

With no endeavor to draw a precise line of demarkation between the minor and the major infectious diseases, I note briefly some points in regard to what I believe should be done or may be done by local boards of health for the purpose of lessening their prevalence. What *may* be done varies in different places as the health laws, as the standard of sanitary education of the public, and as the devotion of local boards of health to the public health service vary.

Measles.—The death-rate from measles and the deleterious influence upon the physical condition which follows measles and its sequels are serious enough to stamp this disease as a not insignificant one. The number of deaths from measles in the New England states in the ten years, 1896 to 1905 inclusive, was 4,493. The number of deaths from scarlet fever, within the same states during the same years, was 4,029, from typhoid fever, 12,700; from diphtheria, 18,801. Thus measles causes almost as many deaths as scarlet fever, more than one-third as many as typhoid fever, and nearly one-fourth as many as diphtheria. In some of the states, in Maine and California at the two extremes east and west for example, the mortality from measles is greater than from scarlet fever.

In Maine local boards of health are advised to isolate cases of measles, particularly the initial cases when it is practicable to get at them so as to prevent the general diffusion of the infection. When measles has become extended, the effort to control the disease has generally been an uphill business. The two special reasons for this, as we all know, are the high degree of infectivity and the long prodromal period during and from the first of which the sick person is infectious.

While in Maine the State board of health has been content to leave with the local authorities the decision of the question whether strict quarantine shall or shall not be applied to a given case or a given outbreak of measles, local boards are urged to exclude strictly from the schools, during measles times, all pupils which have coryzal symptoms, and all persons from families in which measles is known to be present.

While our State board has set its face against the frequent or indiscriminate closure of schools because a case or a few cases of infectious disease have appeared, I am personally of the opinion that a good

reason for the closure of schools is present more frequently in connection with outbreaks of measles than in outbreaks of the other infectious diseases generally. That is also the conclusion to which some of the English medical officers of health have come. When diphtheria, scarlet fever, or smallpox is discovered in a community, the closure of the schools for a brief time, until the local health officers can put their finger on and count up infected points, is sometimes justified; but a more prolonged closure of the schools on account of measles is sometimes a distinct advantage—closure for a period of time somewhat greater than that of the period of incubation.

Clincial and epidemiologic observation seem to indicate that the period of personal infectivity in measles is somewhat brief and that the vitality of the infective agent is not long lasting. These apparent truths have a bearing upon the length of quarantine and the question of disinfection.

The things which it appears to me are desirable to do to control measles, or at least to minimize the danger from it, are:

1st. The impressing of the fact upon the public that measles is a serious malady, particularly dangerous to infants; that the death-rate from it comes well up to or equals that from some other diseases which alarm the people more; that the only rational course is at all times to avoid the infection of measles, and especially to safeguard infants from this very serious danger to them.

2d. Quarantine commensurate with the inclusiveness or effectiveness of the local laws, with the intelligence and tractability of the populace, and with the prospect of making results compensate for trouble and cost.

3d. In the light of our present knowledge and want of knowledge regarding the infective agent of measles, I believe we should at least encourage and advise householders to have all rooms and household goods disinfected which have recently been exposed to the infection of measles.

Whooping Cough.— Like measles, whooping cough is especially dangerous to infants. The number of deaths from whooping cough in the six New England states in the years 1896 to 1905 inclusive, was 6,095. This is a larger number than from scarlet fever by 1,466, and 1,602 more than from measles. Whooping cough deserves more attention. The least that should be done is the exclusion from the schools of pupils who have this disease and the exclusion from the schools of all other children from infected homes. Any other course is rank injustice to other families in which there are children who should go to school. Any other course is sometimes a gross waste of

the public school money. Just as I write, a letter comes saying that because children who have been exposed to whooping-cough are attending a certain school, the parents in other families are keeping their children at home.

Chickenpox. Another minor infectious disease whose chief interest to the health officer is that it makes much trouble in becoming mixed up with smallpox in the mental operation of untrained diagnosticians and sometimes with those who have had considerable experience with smallpox. And yet cases of considerable severity are seen that recognize, found almost always, so far as my personal observation goes, in young adults or persons past the age of puberty. I believe it desirable that the notification of this disease be made compulsory by statutory provisions or by orders of State boards of health, and that exposed infectious persons be kept from schools and other public assemblies.

German measles. The death rate from this disease is small, but cases of the disease are not very rare. I believe that all children [illegible] to the schools should rigorously be excluded, for the most common requirement is that scarlet [illegible] often labelled "German measles." All [illegible], whooping cough, chickenpox, and German [illegible] to municipal boards of health.

[illegible] of next expedient to our routine, it is desirable that [illegible] be excluded from the schools, particularly when [illegible] of tonsilitis have [illegible] to outbreaks of diphtheria.

[illegible] disease only in particular thought and practice [illegible] States in the ten years, 1896 to 1905, 13,170 deaths were [illegible] in the registration reports. The death-rate [illegible] and the long periods of impaired [illegible] special recovery stage this disease as a serious [illegible]. I believe, use their full influence in [illegible] infectivity of la grippe and in influencing [illegible] for the rights and [illegible].

[illegible] of the chief causes of death, cannot be [illegible] of the infectious diseases save in the [illegible] with the communicable [illegible]. I believe there is an urgent need [illegible] to the public [illegible] of pneumonia and the [illegible] should be observed to guard against transmission.

A FEW MEASURES FOR THE CONTROL OF THE SO-CALLED MINOR INFECTIOUS DISEASES.

DR. ALFONSO PRUNEDA, MEXICO CITY, MEXICO.

No one can deny that the hygienist should devote his attention not only to those infectious diseases which, owing to their serious consequences and the dire results caused by their propagation, constitute real social plagues, but also to a whole class of infections, which even though less transcendental in their results, are nevertheless deserving of serious study, precisely because they are transmissible and therefore evitable. Diseases such as tuberculosis, yellow fever, cholera and bubonic plague have ever been a source of worry to the sanitary authorities, and the explanation therefor is not hard to see, when it is remembered that these infections cause great calamities by their spread, whilst some, as for instance the three last named, are readily propagated beyond the limits of their own territory, becoming thereby true international scourges. But there are others of which it might be said that they attract less notice, which however, do not thereby offer less individual and collective danger, justifying therefore the attention paid to them by hygienists.

Measles, scarlet fever, erysipelas, whooping cough, diphtheria, and several others are undoubtedly not so disastrous as the greater infections enumerated in the preceding paragraph; but this fact, however, in no way renders them less serious for those attacked nor for those who run the risk of being so. The immediate consequences of some, the after effects of others, are sufficient grounds why, even though they be not fatal in their outcome, attention should be paid to them, in order to avoid as far as in mortal power lies, their transmission and so lessen their harmful results.

For these reasons I cannot refrain from warmly applauding the course taken by the American Public Health Association in including in its subjects for general discussion in the present meeting the study of the measures for restraining the spread of this class of infections. In order therefore, to contribute, even though it be in a small way, to this useful deliberation, I desire in the present paper, to present before the Association a few of the measures employed in the city of Mexico in the fight against these diseases.

The principal means employed in Mexico to avoid the transmissibility of infectious diseases are two-fold: first, a hygienic propaganda

in all educational institutions; and secondly, a direct and immediate fight by the sanitary authorities against these infections. The first of these courses might be termed theoretical, while the second certainly belongs to the practical achievement of methods previously advocated.

The public schools in Mexico include in their curriculum of studies the teaching of hygiene, which is imparted from the earliest years and which in certain establishments, such as the secondary schools and the arts and crafts school, is continued even in the more advanced studies. In the schools, known according to the classification in use in Mexico as the higher primary, for instance, there exists a compulsory subject called "Notions of Physiology and Hygiene," in which in addition to the indispensable elements of anatomy and physiology, rudiments of hygiene are taught, in which the thorough study of the chief infectious diseases is given a prominent part, while the conditions of their transmissibility, how to avoid them, etc., are most fully entered into. In the other high schools the study of hygiene takes the form of lectures, almost always illustrated by pictures, relative to the principal points necessary for the preservation of health, among which the knowledge of the most important notions referring to the commonest infections is included.

The results of this hygienic education are plainly to be seen; it is certain that the notions acquired at school leave a deep impression on the youthful mind, and are later turned to account in the public weal. Every child who has heard the excellent results of hygiene extolled, and has learned especially how men of the present day have been able to almost completely abolish ills which formerly constituted real social scourges, will surely be later in life the warmest defender of hygienic habits and hence will help most efficiently to arrest the propagation of infectious diseases.

But in another way, and [illegible] the less interesting, the public schools of Mexico [illegible] the spread and propagation of [illegible] frequently met with in children: measles, scarlatina, diphtheria, [illegible] infection. [illegible] all the primary schools are, has published [illegible] by which teachers are not allowed to admit children [illegible] these infections (the teachers being given the [illegible] the tracing of these infectious diseases in the children), as well as that these children or those in whose homes there [illegible] should not return to school until such time as the laws of hygiene prescribe for the disappearance of all danger of contagion. By these measures it is by no means venture-

the city of Mexico and the Federal District have 20 sanitary inspectors on their pay, while those belonging solely to the city have in addition a chief of inspectors.

As soon as the disease is over the board of health gives orders for the careful disinfection of all the rooms and such objects as may be susceptible of disinfection. For this purpose there exists a special office, the service of which is free. On the other hand if from the examination practiced by the sanitary inspector it should be revealed that the material conditions of the house in which some case of infectious disease has occurred, are of such a nature as to constitute a menace to the public health, thus fostering the causes which may have originated the disease, then the board of health orders the respective proprietors to undertake such repairs as may be deemed necessary, and these proprietors are obliged to carry them into effect in conformity with the law, under penalty of being punished in case of violation of these orders.

Such are briefly the principal measures that the Mexican sanitary authorities employ in case of infectious diseases.

Undoubtedly one of the greatest advantages of meetings such as the present one is the interchange of ideas and opinions, and hence a wider growth of knowledge; my sincere wish is therefore that the facts which I have presented to the consideration of this honorable Association may in some slight way serve to bring to light new points of view in the transcendental subject of the prophylaxis of infectious diseases. If unfortunately this be not possible, may I at any rate have the satisfaction of having made known what a young nation, but a fervent devotee of progress like Mexico, is accomplishing in so important a branch of public hygiene.

CONTACT INFECTION.

CHARLES V. CHAPIN, M. D., PROVIDENCE, RHODE ISLAND.

In order to successfully combat the contagious diseases it is of the utmost importance that we should know their mode of transmission. Yet it is surprising how little accurate knowledge we possess. We do know that yellow fever and malaria are transmitted solely by the bite of mosquitoes, but we have very few definite data as to the mode of transmission of our common diseases such as diphtheria, scarlet fever, measles, smallpox, typhoid fever and tuberculosis. The last named disease well illustrates these unsatisfactory conditions. Some of the highest authorities claim that tuberculosis is nearly always acquired by drinking the milk of tuberculous animals, others equally eminent, think that this almost never occurs; some believe that tuberculosis is caused by the inhalation of dried and pulverized sputum, while others think that such dust is practically innocuous, and lay great stress on "droplet infection." As regards most other contagious diseases there is an almost equal lack of exact knowledge. In the absence of definite knowledge various theories are current on which our preventive measures are based. Among assumed modes of transmission may be mentioned that by insects, in which the insect may be either the host, or merely the carrier of pathogenic organisms. This has been proved to be the sole mode of transmission of malaria and yellow fever and of some importance, and perhaps of very great importance in plague, but for the ordinary diseases of the temperate zone there is little evidence that this mode of infection is a real factor. The assumed relation of typhoid fever and flies is certainly not proved, and for civil conditions there is some evidence that flies play little or no part in the transmission of this disease.

Infected food and drink have considerable proved importance, particularly in typhoid fever, dysentery, cholera and summer diarrhoea, but this importance has been over, rather than under-rated.

Infection by means of the inspired air has probably always been held to be the chief factor in the spread of the contagious diseases. Aerial infection is variously explained, or as in the case of the alleged long distance infection from smallpox hospitals no attempt is made to explain it. Close range infection, that is at the distance of two or three feet is explained as due to Fluegge's droplets; infection in the room, the house, or the hospital ward, is supposed to be due

to dried infective material floating as dust. There is not time here to discuss the theory of infection by inspired air, but I have found very little evidence of its importance and much against it.

Another theory may be called that of infection by fomites. This assumes that various articles used by a sick person, or standing in the sick room, become infected, and retain the infection for long periods of time, so as to infect those who then handle them. The health officer and the public have set much store by this theory, and though it has been grossly overworked as regards that disease in which its importance can be demonstrated beyond a doubt, namely, yellow fever, it is still put forward to explain the spread of our commoner infections. Just here I want to emphasize a distinction which is made by everybody, though it is not found in the dictionaries. An infected book, or dress, or toy, that is put away, and used weeks or months afterwards, is the sort of thing which is thought of when fomites are mentioned: a cup or a pencil which moistened with secretion from the mouth by another within a few minutes or perhaps an hour or two afterwards. The latter may be of great importance in the transmission of infection, while the former may and I believe does have very little importance.

The third is to the consideration of another mode of infection to which [illegible] importance is being attributed. This is the [illegible] infection. It is not easy to define this term well, but it is used as signifying a quite direct transference [illegible] from the sick to the well, without the intervention of [illegible] or fomites. There are excellent reasons why the former aerial and [illegible] should be [illegible] theories. The large majority of cases of contagious disease are not traced to their source. It was naturally assumed that they must have come from the known cases, hence the mode of transference had to be by the air or carried in some [illegible]. We now have reason to assume that [illegible] and the data of bacteriology as well as [illegible]. One of the most important results of the experience of the last quarter of a century is the [illegible] of long duration of carrier cases, [illegible] are growing. Moreover [illegible] there is no hard and fast line between the [illegible] and the mere carriers. We have [illegible] from the fatal cases to [illegible] that they cannot be recog-

nized except by laboratory methods, and rarely are recognized. We know that the mild cases and the carrier cases exceed the reported cases in number, and we are justified in assuming that the reported cases arise by "contact infection" from the mild and carrier cases, and not by around-about aerial or fomites infection from the reported cases. The wonder is, not that we have so many untraced cases of contagious disease but that we do not have more. The demonstration of the importance of these mild and carrier cases has not as yet had much influence on sanitary practice, but it is certainly destined to in the near future. Most persons shut their eyes to the facts. It is easier to do so than change ideas and methods. Those who deny the frequency of these unrecognized sources of infection will probably cling to the old ideas in regard to the mode of transmission.

Fifteen years ago it was generally believed that typhoid fever was caused by infected drink or infected air, and if the latter, sewer air was usually the assumed factor. My own attention was first called to the importance of contact infection in this disease by a report by Sedgwick on an outbreak at Bondville, Mass. in 1892. His graphic description of the careless disposal of excreta, and the filthy habits of the people clearly showed that there was no need for assuming any other source for the outbreak than a pretty direct transference from person to person. Similar observations were made by Koch in an outbreak invesigated by him at Trier in 1903.

The very valuable report on typhoid fever in our army during the Spanish war, and the observations of the English in the Boer war, indicate very clearly contact infection as the chief factor in camp typhoid. Jordan's report on typhoid in Winnipeg also laid great stress on this mode of infection, and many recent writers in Germany and in this country are attributing great importance to it. It is my own opinion that the larger part of the typhoid fever in the United States to-day is caused in this way. Certainly only a small part is due to infected water or milk, and still less to infected air. The great number of convalescents who are excreting the bacilli in their urine while freely mingling with the public, and the great number of carrier cases, like the woman recently discovered in New York, are amply sufficient to cause most of our typhoid by contact, particularly when their excreta are in so many instances stored in an old fashioned privy vault or discharged directly on the ground.

Many years ago, from the study of conditions in my own city I began to be skeptical as to the importance both of the air and of fomites as ordinarily understood, as vehicles of infection in scarlet fever and diphtheria. In houses containing more than one family,

the [illegible] in a majority of instances affect only one family, although [illegible] hallways, cellars, and often water closets and privies, [illegible] the virus of these diseases was nearly as [illegible] opposed, it would often be carried by the air, [illegible] and door knobs, transmitted to the other [illegible] other families in the house [illegible] 75 per cent were infected, and in diphtheria [illegible] 7 per cent. Furthermore, investigation shows [illegible] from family to family, personal [illegible] The frequency with which a [illegible] for days in a school [illegible] that infection is not so easily [illegible] close contact is probably [illegible] and no carriers [illegible] That contact [illegible] which have caused the [illegible] not one has come to the [illegible] had never had it. Dr. Schamberg [illegible] diphtheria [illegible] the use of the words [illegible] to keep hands off

[illegible] in Europe which, [illegible] the Pasteur Hospital in [illegible] essential feature of [illegible] guarded against by every [illegible] disregarded. Since this [illegible] cases of smallpox, measles, [illegible] entered and never spreading into a room [illegible] by nurses who passed directly from one [illegible] less than a dozen transfers of [illegible] better than in the very best of [illegible] separate nurses are provided for [illegible] to guard [illegible] articles that come out of these rooms [illegible] whatever goes in is sterilized (at least [illegible] concerned). The attendants wear

gowns but do not change them in passing from patient to patient unless they become infected by contact with bed or patient. The nurse often enters the room to speak to the patient, or carry some article without infecting dress or hands, and so may safely go to another patient without washing her hands, but if anything in the cubicle is touched the hands are at once disinfected. The success of this method depends upon the training of doctors and nurses. They practice what the French call medical asepsis, along the same lines that our surgeons perform operations. Formerly air infection chiefly, was feared in the operating room, but the danger is now known to be from contact with hands, instruments, dressings and the patient's skin. So high an authority as Ochsner says that aerial infection is a neglible quantity. Contact infection only is to be guarded against. Some say that the cubicles, even if the doors do remain open, prevent much aerial infection, and to this is due the success of the Pasteur Hospital. But other European hospitals make use of low screens between the beds with substantially as good results. In fact cubicles or screens are valuable chiefly for their moral effect on attendants, and with scrupulous care to prevent contact infection, it is possible to treat measles, scarlet fever and diphtheria in an open ward without cross infection. Measles is generally considered a very infectious air borne disease, but the French physicians are satisfied from their experience that it extends almost exclusively by contact infection.

There is no opportunity in a brief paper like this to set forth all the arguments against what may be called the aerial and fomites theories of infection, or to present in detail the reasons for considering contact infection as the chief factor in the spread of the contagious diseases. Indeed there is no need of doing so at a meeting like this. You are probably well aware of the trend of observation, experiment and practice. This paper is to emphasize the need for educating the medical profession and the public. That there is such need I can well attest. Thus at one of the finest hospitals in this country with separate wards for scarlet fever and diphtheria a considerable number of cases have arisen in the general wards. The germs were supposed to be air borne, as it was said there was no other possible avenue of infection. When I saw the head nurse lick her finger to facilitate turning the bedside charts of diphtheria patients, I suspected that the principles of medical asepsis had not been entirely mastered. Called to see a case of scarlet fever in a well to do family, I found the door of the sick room carefully hung with a sheet to keep the infection from the other children. After examining the throat with a spatula I handed the latter to the mother. She took it into the hall and put it

on an upholstered sofa, and with her saliva infected hands opened the door of an adjoining room. The attending physician meanwhile sat on the bed and handled the patient, an entirely unnecessary proceeding at that time, and except for example set him, would have forgotten to wash his hands before leaving. A certain hospital determined to copy in one of its wards the cubicle system of the French, but had so missed its essential features that I found doctors and nurses going from cubicle to cubicle feeling the pulse, smoothing the bed clothes, and handling dishes without ever stopping to wash their hands. Meanwhile the screen was supposed to prevent the microbes from passing from bed to bed, and we all carefully wore gowns and caps so that the wicked little germs might not jump into our hair and then jump off again on to the next patient. In another fine hospital for contagious diseases, where great stress is laid upon ample space between different diseases so as to prevent cross infection, the superintendent was observed to freely touch articles about the ward, and handle the patients, and then go to the public office without even washing his hands. Such incidents could be multiplied indefinitely. There is ample room for improvement in the management of contagious diseases. We must teach those who have the care of the sick not to waste so much time on the invisible, dry and dead micro-organisms of the air, but to use more soap and water on their hands. Better still, try not to infect the hands or clothes in the sick room. There is a great deal of unnecessary handling of the patient, and infected articles, by health officers, physicians and nurses. In visiting a contagious case as consultant I almost never wear a gown, and often do not even infect the hands. By paying more attention to contact infection, isolation in the family and hospital will be easier and more successful

TYPHOID FEVER AT KNOXVILLE, TENNESSEE, AND ITS RELATION TO THE WATER SUPPLY.

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BOSTON, MASSACHUSETTS.

The city of Knoxville, finely situated in the foothills of the Clinch Mountains in the eastern part of Tennessee just below the junction of the French Broad River with the Tennessee, is a rapidly growing city of about sixty thousand people. The population is of a mixed type. The city is the center of the Tennessee marble industry. It also has a large country trade and various manufactures. The climatic conditions are quite favorable. The city is situated on the rolling banks of the river, and while the soil is clayey, the topography is such that natural drainage is very good.

The population of Knoxville is increasing rapidly and the typhoid fever death rate is considerably above that of Northern cities having good water supplies as shown in the following table and plot. The plot also shows that the typhoid death rate fluctuates considerably although the general tendency is downward.

The data does not include the cases occurring in West Knoxville just previous to 1898 due to the polluted water furnished by the Lonsdale-Beaumont Water Company, nor does it include those cases occurring among the soldiers encamped at Knoxville during the Spanish-American war, although the latter cases probably did have an indirect effect upon the health of the city.

SHOWING POPULATION OF KNOXVILLE WITH TYPHOID FEVER DEATH RATE AND POPULATION OF KNOXVILLE AND SUBURBS NORTH OF THE RIVER AND ITS TYPHOID DEATH RATE.

Year.	Population Knoxville.	Typhoid death rate per 100,000.	Population with Suburbs.	Typhoid death rate per 100,000.
1890				
1891	22,500	133		
1892	22,900	65		
1893	23,300	51		
	23,700	92		

SHOWING POPULATION OF KNOXVILLE, ETC.—Concluded.

Year	Population Knoxville	Typhoid death rate per 100,000	Population with Suburbs	Typhoid death rate per 100,000
[illegible]	24,100	58		
[illegible]	24,500	33		
[illegible]	24,900	52		
[illegible]	25,300	47		
[illegible]	31,400	70	37,000	73
[illegible]	31,900	47	38,000	39
[illegible]	32,637 Census	40	40,000	45
[illegible]	35,000	56	43,000	53
[illegible]	39,000	59	46,000	61
[illegible]	42,500	66	49,000	71
[illegible]	45,000	53	52,000	58
[illegible]	48,500	43	55,000	45

[illegible] death rate compares with the average typhoid death rate [illegible] Southern cities, it is obviously unfair to compare it with [illegible] Middle States cities as shown in the following table

[illegible] Population (1900) | Typhoid Rate per 100,000 | Population (1900) | Typhoid Rate per 100,000*

Alexandria, Va.	14,339	67.96	Paducah, Ky.	19,446	42.28
[illegible]	[illegible]	69.54	Petersburg, Va.	[illegible]	67.22
[illegible]	[illegible]	84.28	Raleigh, N. C.	13,643	73.58
[illegible]	[illegible]	74.15	Richmond, Va.	85,050	71.16
[illegible]	[illegible]	48.50	San Antonio, Tex.	53,321	57.66
[illegible]	[illegible]	47.92	Savannah, Ga.	54,244	49.30
[illegible]	[illegible]	60.72	Washington, D. C. (For 1906)	278,718	43.30
[illegible]	[illegible]	43.52	Washington, D. C.	[illegible]	53.30
[illegible]	[illegible]	65.34	Wheeling, W. Va.	38,878	57.92
[illegible]	[illegible]	41.80	Wilmington, N. C.	20,976	52.92
[illegible]	[illegible]	51.52	Knoxville, Tenn.	32,637	40.00

*U. S. Treas. Dept. Hyg. Lab. Bull. No. 35, p. 14.

Among the cities are Lexington, Memphis and Savannah supplied with [illegible] well water of great purity, and Norfolk supplied with [illegible] filtered surface water. Yet compared with these cities the typhoid death rate of Knoxville is not remarkably high.

Notwithstanding the rapid growth of the city the number of deaths [illegible] remarkably [illegible] the following table will show:

TYPHOID DEATHS BY YEARS.

Year.	Total Deaths.	Within Corp. Limits.	* Outside Corp. Limits.	
1898	28	22	6	
1899	15	15	0	
1900	16	13	3	
1901	23	20	3	
1902	28	23	5	
1903	38	28	10	
1904	28	24	4	
1905	25	21	4	
1906	20	15	5	To Oct.

* Not including south of the river.

The negro population is 23% of the total population yet the percentage of negro typhoid cases is 34.39% of the total cases. The negro population is 32.50% of the white population yet the negro cases are 52.41% of the white cases.

It is seen at a glance that the negro typhoid death rate is higher than the white. This is shown on the following table and plot.

WHITE AND NEGRO TYPHOID FEVER DEATH RATE.

1898-1905.

Year.	White.	Negro.
1898	66	106
1899	31	68
1900	39	43
1901	51	61
1902	50	94
1903	55	150
1904	35	117
1905	42	63
Average	46	88

The city is not well sewered. The parts of the city that most need the sewers are for the most part unsewered. There is a general tendency for sink-drains to empty into the gutters. Although there is an ordinance prohibiting the issuance of new permits for this practice, there is none prohibiting the use of those drains already in use. In parts of the city what cannot be thrown into the street goes out the back windows. There are ordinances to prevent these practices but the practice is not stopped. Privy vaults exist in thickly populated parts of the city.

The water supply is the Tennessee river water filtered. The intake of the pumping station is located above all of the sewer outlets and the drainage of one small ravine immediately above the intake is also diverted to a point below. The pumping station on the bank of the river lifts the water to a purification plant situated on one of the highest hills of the city. The present capacity of the pumps is [illegible] gallons a day which is to be supplemented by a pump having a nominal capacity of 10,000,000 gallons a day. The purification plant consists of a coagulating basin and eighteen Warren filters. The plant was built in 1893 and the coagulating basins the same year; the coagulating basin was enlarged in 1899 and again in 1901. The filters have a nominal capacity of 4,500,000 gallons per diem, but during the past summer they were operated at a higher rate. The consumption of water at Knoxville is as follows:

Average Daily Consumption

Year	Gallons
1896	2,281,418
1897	2,217,133
1898	2,368,453
1899	2,[illegible]02,946
1900	2,[illegible]32,511
1901	2,[illegible]02,167
1902	4,212,251
1903	3,[illegible]06,456

The average daily consumption during 1907 has been very much higher and the maximum daily consumption during July 1907 was [illegible] gallons, taxing the capacity of the plant considerably.

[illegible] reservoirs located on [illegible] and from these reservoirs the water flows [illegible] trouble with [illegible] The chief objection [illegible] the large amount of [illegible] matter which is eroded [illegible] especially after severe rain-storms. At

times the turbidity of the water reaches 3,000 parts per million, and the numbers of bacteria, 50,000 per cc. Notwithstanding the amount of suspended matter in the water, its removal is effected with a very small dose of sulphate of alumina applied to the water before it passes through the coagulating basins.

It is a peculiarity of the Warren filter that very coarse sand is used as a filtering medium. Consequently, if a large amount of coagulated suspended matter should be delivered to the filter the coarse sand in the latter would not retain it but it would pass through into the clearwater basin. The purification plant at Knoxville does its work, therefore, largely because of the efficiency of the coagulating basin which reduces the suspended matter and bacteria to such a degree that comparatively little work is left for the filters themselves. During the last year the capacity of the plant has been heavily taxed and water has been filtered at a rate one-third in excess of the nominal capacity of the filters, and while the results show a slight decrease in efficiency a good degree of purification has been effected. Occasionally some coagulated matter passes the filter and appears in the effluent. This, however, settles during storage in the filtered water reservoir and does not appear in the water supplied to the city. Beginning in 1904 the filters have been operated by a competent bacteriologist and an accurate record of the operation of the filters has been kept.

The numbers of bacteria in the river water, coagulating basin, filter effluent and tap at the water company's office, respectively, are given in the following table:

AVERAGE NUMBER OF BACTERIA.

Year.	River Water.	Coagulating Basin.	Filter Effluent.	Office Tap.
1904	3,837	339	44	547
1905	7,866	643	136	814
1906	7,037	1,010	270	124
Average	6,247	664	150	495

The bacterial efficiency of the filters in detail for the years of record is as follows:

Year	Efficiency of Coagulating Basin.	Efficiency of Filters	Efficiency of Plant
1904	91.16%	87.02%	98.88%
1905	91.58%	78.85%	98.28%
1906	85.65%	73.27%	96.16%
Average	91.21%	79.71%	97.76%

During 1904 and 1905 presumptive tests for B. coli were made at frequent intervals and during 1906 this rough method was replaced by a more careful search for B. coli as recommended by the committee on uniform methods of water analysis. The results of this work are given in the following table:

RESULTS OF TEST FOR B. COLI.

A. RAW WATER. PERCENT OF POSITIVE TESTS.

Year	Volume Tested c. c. 0.01	0.1	1.0	10	50
1904	18.75%	25.01%	28.00%	25.29%	43.03%
1905	21.68%	29.81%	29.40%	36.79%	23.67%
1906	15.00%	31.25%	47.15%	4.00%	
Average	18.48%	28.69%	34.85%	21.36%	33.35%

B. FILTER EFFLUENT. PERCENT OF POSITIVE TESTS.

Year	Volume Tested c. c. 0.01	0.1	1.0	10	50
1904		0	15.19%	25.71%	30.00%
1905		0	11.92%	17.70%	17.00%
1906		9.44%	24.00%	18.52%	
Average		3.15%	17.39%	20.65%	23.50%

C. Office Tap. — Percent of Positive Tests.

Year.	Volume Tested. c. c.				
	0.01	0.1	1.0	10	50
1904	.....	20.62%	8.34%	14.42%	8.34%
1905	.....	24.90%	7.36%	14.52%	10.00%
1906	.....	6.81%	14.48%	12.50%	.....
Average	.....	17.78	10.06%	13.81%	9.17%

It is evident that the public water supply of Knoxville is exceptionally safe as compared with those of other cities, and if one based his opinion upon the old idea that an impure water supply is the cause of about 90% of the typhoid, it would be difficult to harmonize such an opinion with the facts because the typhoid fever death rate at Knoxville has been moderately high as the foregoing table shows.

Many limestone springs were used and are used to some extent yet for drinking purposes. Simple sanitary inspection has been sufficient to show that all of these springs are more or less polluted.

The investigation was undertaken for the purpose of learning whether or not the water supply was in any degree the carrier of typhoid fever, and was made by the writers in connection with their service with the Knoxville Water Company.

The method used was the statistical one and the writers are indebted to the Knoxville Board of Health for data showing the number of deaths, the location of the case and whether the diseased was white or colored. The greater part of the vital statistics refer to conditions since 1898.

These data do not include those cases occurring in West Knoxville just previous to 1898 due to the polluted water furnished by the Lonsdale-Beaumont Water Co., nor do they include those cases occurring among the soldiers encamped here during the Spanish-American war, although their influence on the general death rate is apparent. In 1898 the two towns of West Knoxville and North Knoxville were annexed to Knoxville and the Knoxville Water Company bought the Lonsdale-Beaumont Water Company and from that time supplied West Knoxville and Lonsdale with filtered water.

The general method employed was as follows:

The city was divided into districts eleven in number and the number

of deaths in each district as well as the deaths in the two public hospitals have been recorded separately.

The description of each district is given beyond and following each description are the various data. Then follows a summary of the typhoid deaths by years and districts showing the unequal distribution of the disease. Under the heading "Water Supply" in the tables, "Un." signifies that there was a water main in the street but whether or not the city water was used is uncertain.

District No. 1. — Comprising a portion of the 7th and 5th Wards.

This district is very thickly populated, the population being mostly negroes. The sanitary conditions are extremely bad. Although water passes through nearly all the streets in this district, there are probably a large per cent of the houses not supplied. A large percentage of those negro cases in the hospital could undoubtedly be placed in this district. The worst part of this district is that between Jackson Avenue and First Creek, from the creek up over the ridge to Bell; sanitary conditions improve slightly. The spring near Bell Street is used as a source of drinking water by a great many in the district, especially those living in the bend of the creek. How much we can lay to the spring, of course, cannot be told, but leaving the spring out of consideration, there is every chance for the prevalence of typhoid fever. The district is practically unsewered, the streets taking the place of sewers. Filthiness and nastiness abound to the highest degree. This district is part of what is called "Cripple Creek". The percentage of cases known to be supplied with city water is 30%, percentage not supplied with city water, 45.16%; percentage whose water supply is unknown, 25.84%. Probably 5 at least of the number whose water supply is unknown could be placed under the "not supplied", then the percentage not supplied would be 61.29% against 38.71% supplied.

Month	Street and Number	Color	Water Supply
	1903		
September	[illegible]	C	Un.
	[illegible]	C	S.
November	[illegible]	W	Yes
	[illegible]	W	Un.
	1904		
January	[illegible]	C	Un.
September	[illegible]	W	S.

Month.	Street and Number.	Color.	Water Supply.
	1900.		
January	319 Patton	C	Yes
July	Lithgo	C	Un.
	1901.		
July	228 Georgia	C	No
August	919 E. Vine	W	Yes
	1902.		
January	613 New	C	Yes
February	919 Welcker	C	No
May	Owen	C	Un.
August	513 Pritchard	C	No.
October	108 Willow	C	Un.
	1903.		
June	918 E. Vine	C	No
August	1002 Brigham	W	Yes
December	722 Paddleford	C	No
	901 Water	C	No
	1904.		
January	913 Nelson	C	No
March	1008 Welcker	C	No
May	408 Pritchard	C	No
	804 Fulcher	C	No
August	704 Willow	C	Yes
	705 Willow	C	Yes
October	211 Kentucky	C	No
November	133 Georgia	C	Yes
	1905.		
September	Willow	C	Un.
October	608 Nelson	C	Yes
December	Patton	C	Un.
	1906		
August	804 Nelson	C	No

District No. 2. — Comprising a portion of the 5th Ward.

This district along Central Avenue is also far from being sanitarily what it should. To appreciate this it is necessary to see it from the rear. Most of the buildings in this section are supplied with water except those on Mill and Minnow streets, where no deaths are shown. This section is part of what is commonly known as the Bowery.

Month.	Street and Number.	Color.	Water Supply
	1900		
September	108 State	W	Yes
	1903		
January	118 Marble Alley	C	No
May	416 State	W	Yes
	1904		
March	314 Central	C	Yes
	133 Central	C	Yes
	1906		
April	130 Central	W	Yes
October	Central and Commerce	W	Un

District No. 3. Comprising a portion of the 1st Ward.

This is one of the poorer districts, being along First Creek near the river. Conditions here are much the same as in District No. 2.

Month.	Street and Number.	Color.	Water Supply
	1903		
[illegible]	[illegible] State	W	Yes
	1904		
August	944 Kennedy	W	No
October	136 E. Cumberland	W	No
	150 E. Main	W	Yes
December	316 Front	W	Yes
	1905		
[illegible]	[illegible] Cumberland	W	Yes

District No. 4. Comprising a portion of the 10th Ward.

This is a very good residential district. It is, however, just across the tracks from District 6, which is far from being a sanitarily good district. As the greater number of cases here are from 1898 to 1901,

it may be that they are the remnants of the high typhoid death rate which was prevalent in West Knoxville previous to 1898.

Month.	Street and Number.	Color.	Water Supply.
	1898.		
October	715 Forest	W	No
	400 Highland	W	Yes
	1900.		
September	1617 Highland	W	Yes
November	2023 Forest	W	Yes
	1502 Grand	W	No
	1901.		
January	Grand	W	Un.
September	Ninth	W	Un.
	1904.		
May	1926 Forest	W	Yes
November	1612 Forest	W	Yes

District No. 5 — Comprising a portion of the 4th and 6th Wards. This district is in the very center of the city, and in the most thickly populated district. The greater part of the buildings, apart from the business houses, are apartment houses of the best class.

Month.	Street and Number.	Color.	Water Supply.
	1899.		
October	629 Asylum	W	Yes
November	Back Alley	C	No
	1901.		
June	504 Asylum	W	Yes
July	414 W. Clinch	W	Yes
September	Church and Walnut	W	Yes
	1902.		
August	714 W. Church	W	Yes
November	417 W. Clinch	W	Yes

Month	Street and Number.	Color.	Water Supply
	1903.		
May	612 W Clinch	W	Yes
	1905		
December	500 Walnut	W	No
	600 Asylum	W	Yes

District No. 6 — Comprising a portion of the 9th Ward.

This district can be considered as part of the 9th district. It is however, one of the poorest sections of the 9th Ward, and is but little better than District 1. This district is across the railroad from District No. 4.

Month	Street and Number.	Color.	Water Supply
	1898		
September	[illegible] York	C	No
October	Dale	W	Un
	1900		
December	Back Alley	C	Un
	1902		
December	[illegible] York	C	No
	1903		
November	[illegible] Dale	C	No
December	[illegible] York	W	Yes
	1904		
December	[illegible] Dale	W	Yes

District No. 7 — Comprising a portion of the 7th and 8th Wards. This district is about like District No. 9, the section nearer the railroad being the poorer

District No. 9—Comprising all of the 9th Ward and suburbs with the exception of Sec. 6.

District No. 9 includes practically all of the 9th Ward and adjacent suburbs. It is commonly known as Mechanicsville. It is for the greater part populated with the poorer class of mechanics, with the exception of the vicinity of Deadrick and Oak avenues, where there is a much better class of residences. As you will see, cases here are very well scattered. Typhoid in this section has been prevalent for many years, and while in some sections sanitary conditions are very good, in others they are not all that could be desired. Some small sections rival in filthiness District No. 1.

Month	Street and Number	Color	Water Supply
	1898		
June	612 Oak	C	No
September	910 W. Fourth Ave	W	Yes
October	Clinton Pike	W	No
	102 Russell	W	No
	101 Russell	C	Yes
	1899		
April	701 Fourth Ave	W	Yes
July	218 McGhee	W	No
September	414 Crooked	C	No
	1900		
November	111 Crooked	C	No
	1901		
February	50 Ft. Sanders	W	No
July	627 Crooked	W	No
	1111 Asylum	W	Yes
	Atkin	W	Un.
August	911 McGhee	W	No
	1902		
March	1126 Lawrence	W	No
July	Clinton Pike	C	No
August	1101 Asylum	W	Yes
	1433 W. Fourth	W	Yes
October	1101 McGhee	C	No
	1026 Wallace	C	No
November	1012 McGhee	W	Yes
December	911 McGhee	W	No

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1891

Month	Wards 1	2	3	4	5	6	7	8	9	10	11	Gen Hosp	Lau Hosp.
January			1					1	1				
February							1						
March					1								
April									1				
May			1						1				
June													
July	1												
August									1				
September			1	2			1		1				
October							1						
November							1						
December							1						

Total 15 Death Rate 65 per 100,000

1892

Month	Wards 1	2	3	4	5	6	7	8	9	10	11	Gen Hosp	Lau Hosp.
January						1			1				
February			1				1						
March									1				
April	1		1						1				
May									1			1	
June			1										
July								1	1				
August							1						
September					2			2					
October													
November													
December													

Total 15 Death Rate 57 per 100,000

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1893.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January													
February	1					1							
March									3				
April				1									
May							1						
June				1									
July							1		3				
August							1		3				
September									1				
October									1				
November							1		2				
December				1									

Total 22. Death Rate 92 per 100,000.

1894.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January			1										
February													
March				1		1							
April													
May									1				
June													
July					1			1					
August						1							
September			1		1		1						
October							3						
November													
December	1												

Total 14. Death Rate 58 per 100,000.

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued

1895.

Month	Wards											Gen. Hosp.	Lm. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January	1												
February													
March													
April							1						
May													
June													
July													
August			1				1						
September													
October								1					
November									2				
December							1						

Total 8 Death Rate 33 per 100,000

1896.

Month	Wards											Gen. Hosp.	Lm. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January		2	1										
February			1										
March	1								2				
April							1			1			
May							1						
June									1				
July	1								1				
August													
September													
October													
November													
December													

Total 13 Death Rate 52 per 100,000

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1897.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January							1	1					
February													
March			1				1		1				
April													
May													
June													
July								1	1				
August					1					1			
September									1				
October									1				
November													
December							1						

Total 12. Death Rate 47 per 100,000.

1898.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January													
February										1	1		
March													
April													
May		1											
June									3				
July													
August												1	
September					1		1		2				
October							2		1	2	1		
November	1	1					1						
December								1				1	

Total 22. Death Rate 70 per 100,000.

Month	Street and Number.	Color.	Water Supply
	1903.		
May	612 W Clinch	W	Yes
	1905.		
December	[illegible] Walnut	W	No
	[illegible] Asylum	W	Yes

District No. 6 — Comprising a portion of the 9th Ward.

This district can be considered as part of the 9th district. It is however, one of the poorest sections of the 9th Ward, and is but little better than District 1. This district is across the railroad from District No. 4.

Month	Street and Number.	Color.	Water Supply
	1898		
September	[illegible] York	C	No
October	Dale	W	Un
	1900		
December	Back Alley	C	Un
	1902		
December	[illegible] York	C	No
	1903		
November	[illegible] Dale	C	No
December	[illegible] York	W	Yes
	1904		
December	[illegible] Dale	W	Yes

District No. 7 — Comprising a portion of the 7th and 8th Wards. This district is about like District No. 9, the section nearer the railroad being the poorer.

Month.	Street and Number.	Color.	Water Supply.
	1898.		
June	617 Jacksboro	W	Yes
October	317 Park	W	No
November	617 King	W	Yes
	1899.		
June	406 Jacksboro	C	Yes
October	535 Wells Alley	C	No
	W. Park	W	Un.
	315 Hudson	C	No
	1901.		
January	630 Broadway	W	No
August	322 Williams	C	No
October	Williams	C	No
	202 E. Park	W	Yes
	1903.		
May	309 Hudson	C	No
	1905.		
April	Hudson	C	No
November	534 W. Fifth	W	Yes

District No. 8 — Comprising a portion of the 7th, 8th and 11th Wards.

This district is a rather dirty, poor, white district.

Month.	Street and Number.	Color.	Water Supply.
	1901.		
October	806 Morgan	W	Yes
	1900.		
December	905 Central	W	No
	115 Third Ave	W	Yes
	1905.		
August	933 Broadway	W	No
September	806 Morgan	W	Yes

District No. 9 — Comprising all of the 9th Ward and suburbs with the exception of Sec. 6.

District No. 9 includes practically all of the 9th Ward and adjacent suburbs. It is commonly known as Mechanicsville. It is for the greater part populated with the poorer class of mechanics, with the exception of the vicinity of Deadrick and Oak avenues, where there is a much better class of residences. As you will see, cases here are very well scattered. Typhoid in this section has been prevalent for many years, and while in some sections sanitary conditions are very good, in others they are not all that could be desired. Some small sections rival in filthiness District No. 1.

Month	Street and Number	Color	Water Supply
	1899		
June	612 Oak	C	No
September	910 W. Fourth Ave.	W	Yes
October	Clinton Pike	W	No
	102 Russell	W	No
	101 Russell	C	Yes
	1900		
April	701 Fourth Ave.	W	Yes
July	218 McGhee	W	No
September	414 Crooked	C	No
	1901		
November	411 Crooked	C	No
	1901		
February	31 E. Sanders	W	No
July	627 Crooked	W	No
	1311 Asylum	W	Yes
	Atkin	W	Un
August	211 McGhee	W	No
	1902		
March	1320 Lawrence	W	No
July	Clinton Pike	C	No
August	1001 Asylum	W	Yes
	1418 W. Fourth	W	Yes
October	1001 McGhee	C	No
	1426 Wallace	C	No
November	1012 McGhee	W	Yes
December	1 McGhee	W	No

Month.	Street and Number.	Color.	Water Supply.
	1903.		
March	134 Logan	W	No
June	126 Ramsey	C	No
December	940 Hannah	W	Yes
	317 Ramsey	C	No
	1905.		
May	110 Kings Alley	C	No
August	62 Lawrence	W	No
October	717 Dale	W	Yes
	1906.		
July	1725 Washington	W	No
	1211 W. Fifth	W	No
September	520 Arthur	W	Yes
October	1016 Woodbury	W	No

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER.

1890.

Month.	Wards. 1	2	3	4	5	6	7	8	9	10	11	Gen. Hosp.	Lin. Hosp.
January													
February	2					1							
March													
April		1		1									
May					1								
June	1	1	1		1		1	2	1				
July	1				1		1		1				
August							1		1				
September								1					
October						1			1				
November				1		1	3						
December													

Total 30. Death Rate 133 per 100,000.

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1891

Month	Wards 1	2	3	4	5	6	7	8	9	10	11	Gen Hosp	Lan Hosp
January			1					1	1				
February				1			1						
March					1								
April									1				
May			1						1				
June				1									
July	1												
August									1				
September			2				1		1				
October				1			1						
November							1						
December				1			1						

Total 15 Death Rate 65 per 100,000

1892

Month	Wards 1	2	3	4	5	6	7	8	9	10	11	Gen Hosp	Lan Hosp
January			1			1			1				
February				1									
March													
April	1		1										
May													
June			1										
July								1	1				
August							1						
September								2					
October													
November													
December													

Total 15 Death Rate 59 per 100,000

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1893.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January													
February	1					1							
March									3				
April				1									
May							1						
June				1									
July							1		3				
August							1		3				
September									1				
October									1				
November							1		2				
December				1									

Total 22. Death Rate 92 per 100,000.

1894.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January			1										
February													
March				1		1							
April													
May									1				
June													
July					1			1					
August						1							
September			1		1		1						
October							3						
November													
December	1												

Total 14. Death Rate 58 per 100,000.

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued

1895.

Month	Wards 1	2	3	4	5	6	7	8	9	10	11	Gen. Hosp.	Lm Hosp.
January	1												
February													
March													
April							1						
May													
June													
July													
August			1				1						
September													
October								1					
November									2				
December							1						

Total = Death Rate 33 per 100,000

1896.

Month	Wards 1	2	3	4	5	6	7	8	9	10	11	Gen. Hosp.	Lm. Hosp.
January		2	1										
February			1										
March	1								2				
April							1			1			
May							1						
June									1				
July	1								1				
August													
September													
October													
November													
December													

Total 13 Death Rate 32 per 100,000

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1897.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January							1	1					
February													
March			1				1		1				
April													
May													
June													
July								1	1				
August					1					1			
September									1				
October									1				
November												1	
December							1						

Total 12. Death Rate 47 per 100,000.

1898.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January													
February										1	1		
March													
April													
May		1											
June									3				
July													
August												1	
September					1		1		2				
October							2		1	2	1		
November	1	1					1						
December								1				1	

Total 22. Death Rate 70 per 100,000.

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued

1899

Month.	Wards											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January							1						
February							1						
March													
April									1				
May													
June							1						
July									1				
August													
September				1					1				
October						1	2	1		1			
November						1					2		
December													

Total 17 Death Rate 47 per 100,000

1900

Month	Wards											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January			1		1								
February													
March													
April													
May													
June													
July			1										
August											1		
September			1							1			
October	1										1		
November									1	2			
December							1		1		1		

Total 11 Death Rate 40 per 100,000

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER — Continued.

1901.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January								1		1			
February										1			
March													
April													
May													
June						1							
July				1			1		2				
August							1	2	2				
September	1	1								1			
October							3						
November												1	
December													

Total 20. Death Rate 56 per 100,000.

1902.

Month.	Wards.											Gen. Hosp.	Lin. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January							1						
February					1								
March													
April													
May					1								
June									1				
July	1												
August	1		1	1			1		2	1			
September												1	
October							2		2				
November						1			1				
December									2			1	

Total 23. Death Rate 59 per 100,000.

DEATHS IN KNOXVILLE ACCREDITED TO TYPHOID FEVER.—Continued.

1903.

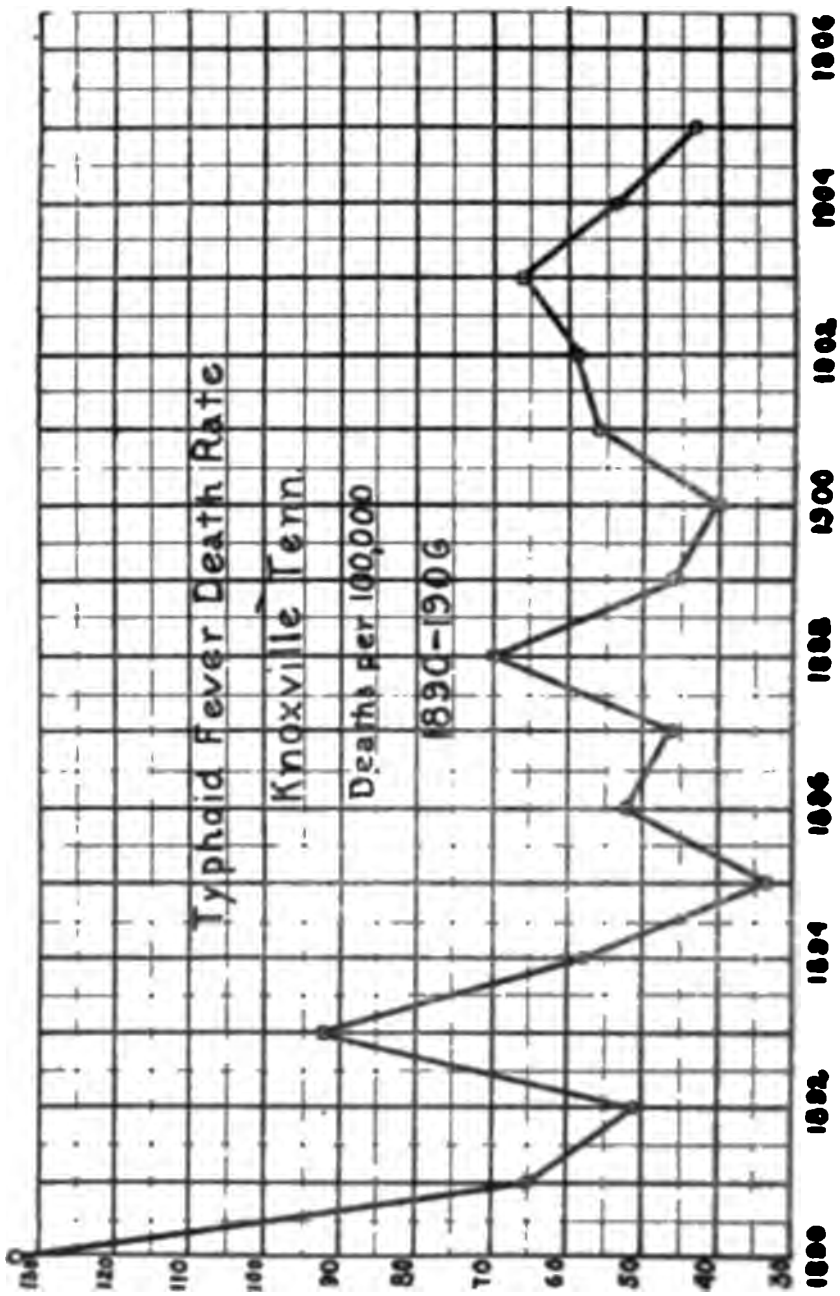
Month.	Wards.											Gen. Hosp.	Lan. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January					1								
February								1				1	
March									1				
April													
May				1	1							1	
June							1		1			2	
July	1											2	
August					1		2					1	
September											1		
October									1	2			
November									2				
December							2		2				

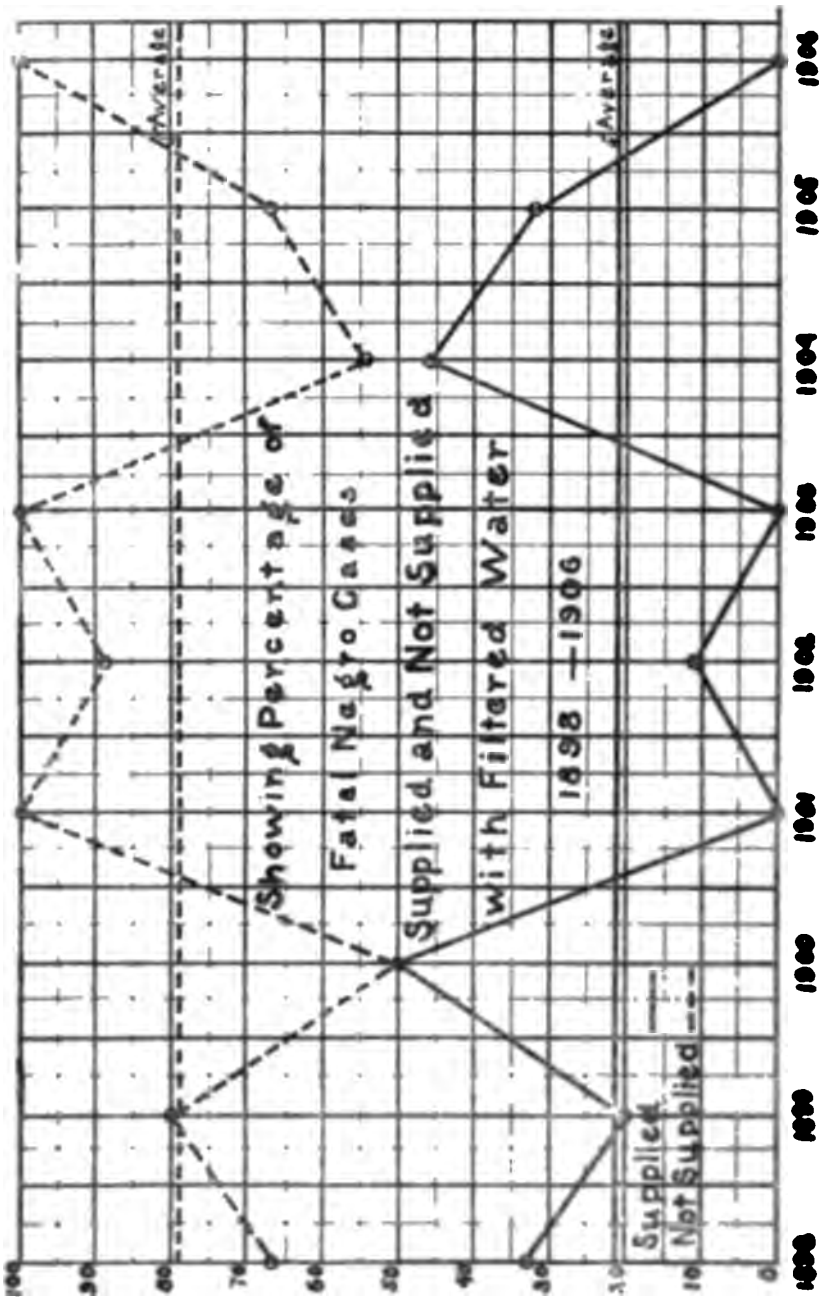
Total 28. Death Rate 66 per 100,000.

1904

Month	Wards											Gen. Hosp.	Lan. Hosp.
	1	2	3	4	5	6	7	8	9	10	11		
January							1				1		
February													
March					3								
April													
May					1		1						
June													
July			1									1	
August	1						2						
September												1	
October	2							1					
November			1				1			1			
December	1								1				

Total 24. Death Rate 53 per [illegible]





The following tables contain summaries of the data concerning the cases and the water supply; the original data has been eliminated from this paper but is given in the appendix,

WHITE CASES FROM 1898 TO 1906.

Year.	Total White.	Supplied with Water.	Not Supplied with Water.	Water Supply not known.	Hospital.
1898	19	4	9	6	0
1899	9	4	3	2	0
1900	12	5	[illegible]	0	0
1901	17	[illegible]	6	4	0
1902	18	[illegible]	9	0	3
1903	21	[illegible]	12	0	1
1904	14	6	3	1	4
1905	17	8	5	2	2
1906	18	4	10	1	3 To Oct.
	145	52	64	16	13

NEGRO CASES FROM 1898 TO 1906.

Year.	Total Negro.	Supplied with Water.	Not Supplied with Water.	Water Supply not known.	Hospital.
1898	9	2	4	2	1
1899	6	1	4	1	0
1900	4	1	1	2	0
1901	6	0	4	1	1
1902	10	1	8	1	0
1903	17	0	11	0	6
1904	14	6	7	0	1
1905	8	1	2	3	2
1906	2	0	1	1	0 To Oct.
	76	12	42	12	11

The following data may be deduced from the tables.

A. — Total Cases.

Percentage of cases supplied with city water, 44.83.
Percentage of cases not supplied, 55.17.

B. — White Cases.

Assuming that seven unknowns or 10 of the 13 cases in the hospital and with water supply unknown then the percentage of cases not supplied with city water would be 78.04 and the percentage supplied 21.96

C. — Negro Cases.

Of those deaths with known water supplies 37.65% were supplied with city water and 62.35% were not.

Assuming that those whose water supply was not known had the same ratio of supplied and unsupplied then the total percentage of cases supplied would be 37.50% while the unsupplied would be 62.44%.

These summaries have been plotted and it is evident from these.

1 That those supplied with city water suffer least from typhoid fever

2 That the negro cases are most often associated with independent water supplies

3 That there is a tendency toward a decreased mortality where the city water is used and the reverse where this is not the case

SUMMARY OF TYPHOID AND WATER SUPPLY DATA

Year	Total Deaths	Supplied with Water	Not Supplied with Water	Water Supply not known
1898	[illegible]	[illegible]	13	0
1899	[illegible]	[illegible]	[illegible]	0
1900	[illegible]	[illegible]	[illegible]	0
1901	[illegible]	[illegible]	[illegible]	0
1902	[illegible]	[illegible]	[illegible]	0
1903	[illegible]	[illegible]	[illegible]	0
1904	[illegible]	12	10	0
1905	[illegible]	[illegible]	[illegible]	0
1906	[illegible]	4	11	8
Total	221	64	106	51

From these data a map has been prepared which shows the districting of the city and the location of the cases. The districts are numbered. The cases are those which have occurred between 1898 and 1906 inclusive. The map also shows the location of springs which have been used or are being used as a source of drinking water supply. The spring in Minnow Street is not now generally used for drinking purposes, nor are those along First Creek near Church Avenue and near Main Avenue. The latter two were formerly used as a supply for that entire district, and may be used to some extent yet. The other springs shown are still used for drinking purposes.

In regard to districting, No. 2 and 3 may be taken as one district. However, the two or three cases lying between 2 and 3 should not be included, as they occur upon the hill and not in the valley along the creek. In these two districts, as you will see, are four of the springs shown on the map. Districts 6 and 9 can also be taken together, 6 being the poorer section of 9.

North Knoxville, or Ward 11, and the adjacent suburb have not been included in a district, as the cases are scattered and not bunched to any extent. This district covers a large area, and includes all classes of people. This district, however, is, the greater part, a very good residential district.

The other cases not in districts are more or less scattered, with the exception of a few among the negro people in the east part of the town. As there is no connection between these cases as to time, I think they are simply off-shoots from District No. 1. As will be seen, the greater number of the cases lie within the districts as shown.

SUMMARY AND CONCLUSION.

All of the above evidence is against the supposition that the water supply is a cause of the high typhoid fever death rate at Knoxville. To begin with, this rate is no higher than that of some other Southern cities having exceptionally pure supplies. Then the Tennessee River is not grossly polluted and the degree of purification effected is equal to the average of that of good plants elsewhere.

The sanitary conditions are bad and the general unclean conditions are especially prevalent among the negroes. Many polluted limestone springs are in use, especially among the colored population.

The use of city water is not associated with the disease especially among the negroes, and the disease is concentrated in districts.

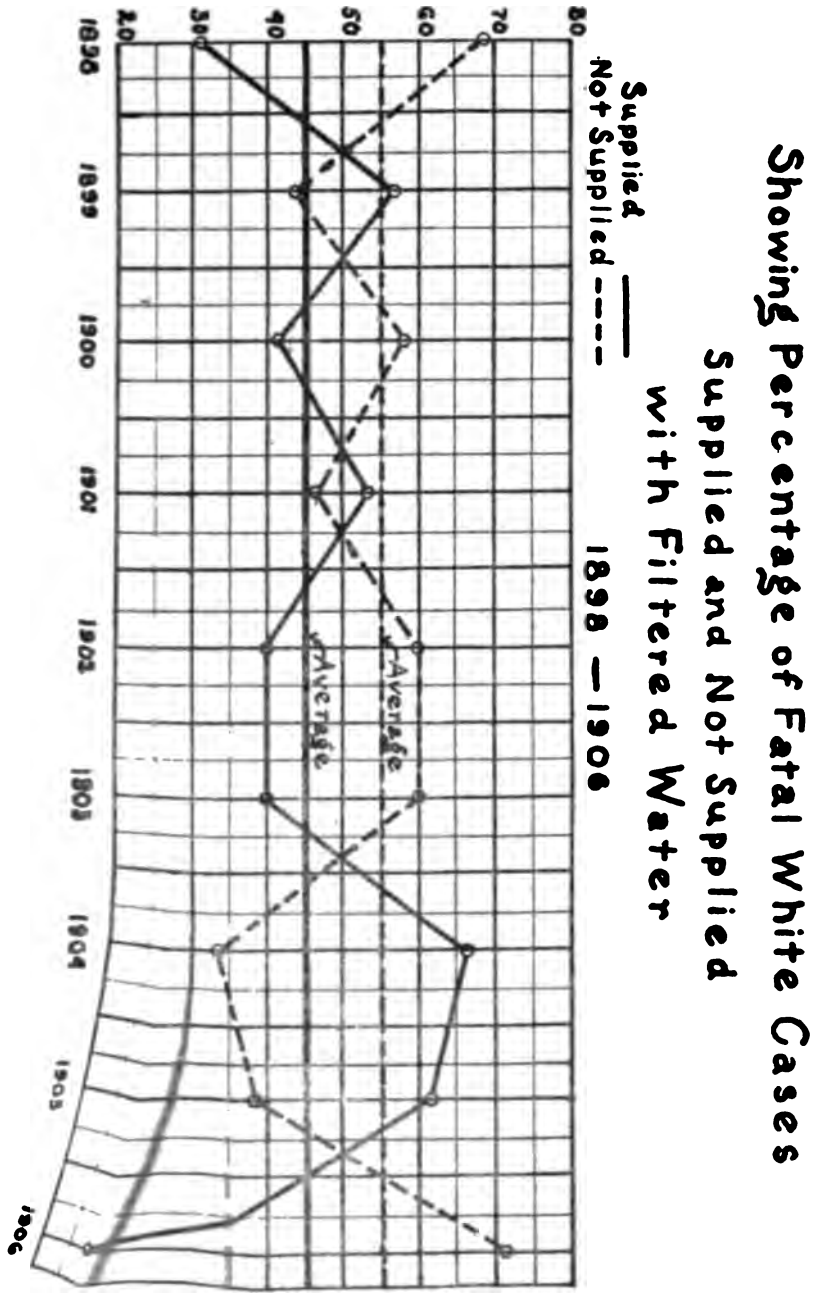
In most Southern cities the servants are colored; do not reside in their employer's houses and go to and from their work daily. This

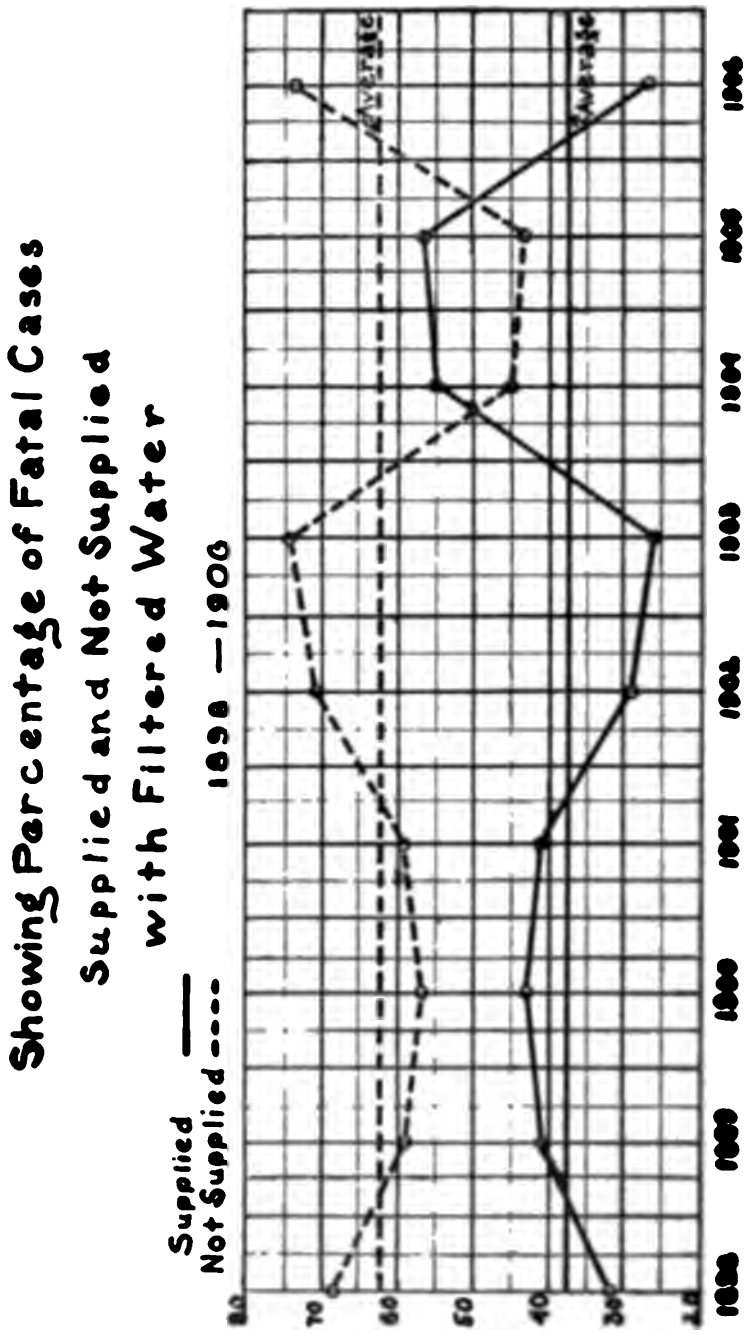
practice must tend to distribute the disease from the poorer to the better parts of the city. In view of the above the writers believe the typhoid fever in Knoxville is — to use Professor Sedgwick's term — prosodemic, and that a large part of it is perpetuated in the unsanitary parts of the city and about certain springs and is carried by contact to the more favored districts.

That the disease should persist year after year in the same localities is proof of the great capacity for life of the typhoid bacillus under unsanitary conditions and the need for more direct dealing with the individual cases, if the disease is to be stopped.

The writers believe that if the geographical distribution of each case for two or three years could be studied as it occurs, that the causes of the disease would be shown and the remedy would suggest itself.

As it is, the study shows the importance of paying more attention to the hygiene of the household independently of the great problems of public water supply and sewerage. Undisinfected typhoid excreta and other infectious material which can become insect borne should be destroyed and typhoid patients should be made by education and law to protect their neighbors against infectious disease.





APPENDIX

Showing Distribution of Cases of Typhoid Fever.

1898.

Month.	Color	Ward.	Street and Number.	Water.
February	W	10	514 Detroit Ave.	No
	W	11	Baxter Ave.	Un.
May	W	2	Jail	Un.
June	C	9	612 Oak St.	Un.
	W	9	617 Jacksboro	Yes
August	C	1	Hospital	Un.
	W	S	2419 E. Fifth Ave.	No
September	C	5	Lithgoe	Un.
	C	9	907 York Ave.	No.
	W	9	910 W. Fourth Ave.	Yes
	C	7	Drew Alley	No
October	W	S	Grove City	No
	W	9	Dale Ave.	Un.
	W	S	Clinton Pike	No
	W	10	715 Forrest Ave.	No
	W	7	317 Park Ave.	No
	W	10	400 Highland Ave.	No
	W	9	102 Russell St.	No
	W	S		
	C	7	315 Hudson St.	No
	C	S		
	W	S		
	C	9	101 Russell St.	Yes
	W	11	104 Lee Ave.	No
November	C	2	609 W. Front St.	Yes
	W	7	136 S. Georgia St.	Yes
	W	7	Georgia St.	Un.
	W	8	617 King St.	Yes

1899.

Month.	Color	Ward.	Street and Number.	Water.
January	C	7	Campbell St.	Un.
February	W	11	116 Munson St.	Yes
April	W	9	709 W. Fourth Ave.	Yes
June	C	7	406 Jacksboro St.	Yes
July	W	9	218 McGhee St.	No
September	C	9	414 Crooked St.	No
	W	3	917 E. Clinch Ave.	No

SHOWING DISTRIBUTION OF CASES OF TYPHOID FEVER — Continued.

1899.

Month.	Color	Ward.	Street and Number.	Water
October	C	7	126 Fairchild St	No
	C	8	535 Wells Alley	No
	W	11	904 E. Fourth Ave	No
	W	7	W. Park Ave	Un
	W	6	629 Asylum St	Yes
November	W	11	1310 Broadway	Yes
	W	10	125 Kulmal	Un
	C	6	Peeds Alley	No

1900.

Month.	Color	Ward	Street and Number	Water
January	C	5	319 Patton St	Yes
July	C	3	Lethgoe St	Un
August	W	11	907 Brookside Ave	No
September	W	10	1017 Highland Ave	Yes
	W	3	408 State St	Yes
October	W	1	1013 E. Main Ave	Yes
	W	5	Grieg St	No
	W	5	908 W. Leroy St	No
November	W	10	2023 Forrest Ave	Yes
	C	9	114 Crooked St	No
	W	10	1902 Grand Ave	No
	W	5	St. John's Orphanage	No
December	C	9	Back Alley	Un
	W	11	933 Central Ave	No
	W	7	115 Third Ave	Yes
	W	5	1115 Vernon Ave.	No

1901

Month	Color	Ward	Street and Number	Water
[illegible]	W	10	Central Ave	Un
	W	8	Broadway	Yes
February	W	10	[illegible] Saunders	No
	A	5	[illegible] City	No
[illegible]	W	6	704 Asylum St	Yes

SHOWING DISTRIBUTION OF CASES OF TYPHOID FEVER — Continued.

1901.

Month.	Color	Ward.	Street and Number.	Water.
July	W	4	414 W. Clinch Ave.	Yes
	C	7	228 Georgia St.	No
	W	9	627 Crooked St.	No
	W	9	1313 Asylum St.	Yes
August	W	9	Atkin St.	Un.
	W	7	919 E. Vine Ave.	Yes
	W	9	311 McGhee St.	No
	C	8	536 Bradley St.	No
	C	8	322 Williams St.	No
	C	S	Jackson Ave.	No
September	W	3	509 E. Church Ave.	No
	W	10	Ninth St.	No
	W	2	Church and Walnut.	Yes
October	C	7	William St.	Un.
	W	7	806 Morgan St.	Yes
	W	7	202 E. Park Ave.	Yes
November	C	8	City Hospital	Un.
	W	S	116 Vance St.	No

1902.

Month.	Color	Ward.	Street and Number.	Water.
January	C	7	631 New St.	Yes
	C	S	1601 New Pine.	No
February	C	5	919 Welcker St.	No
March	W	S	1528 Lawrence St.	No
May	C	5	Owens St.	No
	W	S	Lonsdale	No
June	W	9	1005 Hannah St.	Yes
July	W	.....	City Hospital	Un.
	W	1	809 E. Hill Ave.	Yes
	C	S	Clinton Pike	No
August	W	1	700½ E. Main St.	No
	W	9	1001 Asylum St.	Yes
	W	9	1433 W. Fourth Ave.	No
	C	8	513 Prichard St.	No
	C	7	Hardee St.	Un.
	W	4	714 W. Church Ave.	Yes
	W	10	1933 Havard Ave.	No
September	W	.....	City Hospital	Un.
October	W	7	215 Hume St.	No
	W	9	1000 McGhee St.	Yes
	C	7	108 Willow St.	No
	C	9	1816 Wallace St.	No
	W	S	2656 Woodbine Ave.	No

SHOWING DISTRIBUTION OF CASES OF TYPHOID FEVER — Continued

1902.

Month	Color	Ward	Street and Number	Water
November	W	9	1412 McGhee St	No
	W	6	117 W Clinch Ave	Yes
December	W		City Hospital	Un
	C	9	256 York Ave	No
	W	9	211 McGhee St	No

1903.

Month	Color	Ward	Street and Number	Water
January	C	5	[illegible] Alley	No
February	C		City Hospital	Un
March	W	9	338 Logan St	No
May	C	7	300 Hudson St	No
	W	4	112 W Clinch Ave	Yes
	C		City Hospital	Un
	W	5	41 State St	Yes
June	C	7	918 E Vine Ave	No
	C	9	715 Ramsey St	No
	C		City Hospital	Un
	W		City Hospital	Un
	W	8	137 Webster St	No
July	C		City Hospital	Un
	C		City Hospital	Un
	W	1	814 State St	Yes
	W	8	2413 Linden St	No
	W	8	Oakwood	No
	W	11	Prospect Ave	No
August	W	7	326 Frazier St	No
	C		City Hospital	Un
	W	7	1302 Brigham St	Yes
	C	5	111 Union St	No
	W	8	Grove City	No
	W	8	2005 Harvard Ave	Yes
September	W	11	1111 Alexander St	Yes
	W	8	Chilhowee Park	No
October	W	10	1916 Grand Ave	No
	W	9	94 Hannah St	No
	W	10	1916 Grand Ave	No
	C	8	304 Bertrand St	No
	C	8	304 Bertrand St	No
	W	8	511 Dewey St	No
November	C	9	257 Dale Ave	No
	W	9	916 Hannah St	Yes
December	C	7	722 Baldeford St	No
	C	7	501 Water St	No
	W	9	255 York Ave	Yes
	C	9	1[illegible] Ramsey St	No

SHOWING DISTRIBUTION OF CASES OF TYPHOID FEVER — Continued.

1904.

Month.	Color	Ward.	Street and Number.	Water.
January	C	7	913 Nelson St.	No
	W	11	204 W. Scott Ave.	No
	C	S	New Pine	No
March	C	5	1008 Welcker St.	No
	C	5	314 Central Ave.	Yes
	C	5	318 Central Ave.	Yes
May	C	5	508 Prichard St.	No
	C	7	804 Fulches St.	No
	C	1	1926 Forrest Ave.	Yes
July	C	.....	City Hospital	Un.
	W	4	W Church Ave.	Un.
August	W	1	944 Kennedy St.	No
	C	7	704 Willow St.	Yes
	C	7	705 Willow St.	Yes
September	W	.....	City Hospital	Un.
October	C	8	211 Kentucky St.	No
	W	1	116 E. Cumberland.	No
	W	1	120 E. Main Ave.	Yes
November	W	10	1612 Forrest Ave.	Yes
	C	7	133 Georgia St.	Yes
	W	3	204 E. Church Ave.	Yes
	C	S	Maryville Pike	No
	C	S	145 Maria St.	Yes
December	W	.....	City Hospital	Un.
	W	1	316 Front St.	Yes
	W	9	325 Dale Ave.	Yes
	W	.....	City Hospital	Un.
	W	.....	City Hospital	Un.

1905.

Month.	Color	Ward	Street and Number.	Water.
January	W	S	Caldwell Ave.	Un.
February	W	10	Cumberland Ave.	Un.
April	C	8	Hudson St.	Un.
May	C	9	110 Kings Alley	No
	W	11	110 Pearl Pl.	Yes
July	W	2	108 E. Cumberland.	Yes
	W	.....	City Hospital	Un.
August	W	11	933 Broadway	Yes
	W	9	62 Lawrence St.	No
September	W	7	806 Morgan St.	No
	C	7	Willow St.	Un.
	W	S	Washington Pike	No
	W	S	2016 Howard St.	No

SHOWING DISTRIBUTION OF CASES OF TYPHOID FEVER — Concluded.

1905.

Month.	Color	Ward.	Street and Number	Water
October	W	.....	City Hospital ...	Un
	C	7	606 Nelson St...	Yes
	W	11	505 E. Anderson St...	Yes
	C	2	1511 New Pine...	No
	W	9	717 Dale Ave...	Yes
	W	9	600 Asylum St	Yes
	W	10	217 Second St ...	Yes
November	C	.....	City Hospital ...	Un
	W	8	531 W Fifth Ave ...	Yes
December	C	5	Patton St ...	Un
	W	2	509 Walnut St ...	No

1906.

Month.	Color	Ward	Street and Number.	Water
January	W	11	606 Glenwood Ave	No
	W	11	114 E. Anderson Ave. ...	No
February	W	11	949 Broadway	Yes
April	W	7	1?? Central Ave ...	Yes
June	C	S	Emerald Ave ...	Un
July	W	11	1215 Folsom St ...	No
	W	9	1725 Washington St ...	No
	W	9	1211 W Fifth Ave ...	Yes
August	W	...	Lincoln Hospital ...	Un
	W	...	City Hospital ...	Un
	C	7	504 New St ...	No
	W	S	Lonsdale ...	No
September	W	10	532 Worden St	No
	W	9	1?? Arthur St ...	Yes
	W	S	Lonsdale ...	Un
October	W	5	Central and Commerce ...	Un
	W	9	1016 Woodbury St ...	No
	W	...	City Hospital ...	Un
	W	S	Grave City ...	No
	W	S	1? Pine St ...	No

WATER AS ONE OF THE PRINCIPAL CONVEYERS OF "MOUNTAIN FEVER" — (TYPHUS.)

ARTURO MENDEZ, M. D., San Luis Potosi, Mexico.

Desiring to take up as little of your time as possible, I have condensed my study on the above mentioned topic to its smallest permissible limits and therefore hasten to the point.

Mountain fever (typhus), the terrible plague which afflicts many cities of the Republic of Mexico, but principally those of the central plateau, is a petechial infecto-contagious malady, no organism having as yet been isolated. As you know, and for making a comparison with typhoid fever, I relate you the symptoms and principal characteristics that are as follows: In the prodromal period the patient complains of general uneasiness, pain in the lumbar region, headache and in a great majority of cases epistaxis. Fever is initiated with a chill and rapidly increases without any apiretic interval, reaching 40° C. and in some cases even higher. There is no tidal wave rise of temperature as in typhoid. Profuse sweatings are observed once or twice a day, but the temperature is not reduced by them more than one-half to one degree, and that only in a transitory way. Absolute loss of sleep can be constantly observed from the beginning of the infection. The peculiar but characteristic odor can be perfectly perceived from the second to the fourth day.

The petechii generally appear on the fifth day, their number and size being in relation with the gravity of the case. Consciousness is usually lost about the end of the first week of sickness.

The third or fourth day, reckoning from the termination of incubation period, shows variable symptoms, the only constant one being remittent fever, temperature reaching from 38.5° to 39° C. in the morning, and from 39 to 40 at night, the rise commencing at about 9 o'clock in the morning and reaching its maximum at 9 o'clock or thereabout at night. I have had the opportunity of observing a number of cases of the intermittent type. We furthermore encounter complete anorexia, acute thirst, obstinate constipation followed at times by diarrhœa, coated and dry tongue, gums fuliginous, eyes injected and brilliant, fibrillar muscular contractions, tremors and generally speaking, all the symptoms of a general acute infection.

Complications.—Brain, heart, lungs, etc. Such complications nat-

mal's cause a less favorable prognosis, and at the same time call for specific treatment.

The city of San Luis Potosi, is located at 22°, 13', 5" north latitude, and 1°, 50', 30" longitude west of the city of Mexico, or 101°, 12' 10" longitude west of Greenwich. The altitude of San Luis Potosi is 1850 meters, or about 6000 feet, with a mean temperature of 17° C. and comprising 70,000 inhabitants. In the above cited place, and also my residence and business location, "mountain fever" is endemic, and at times epidemic.

Sporadic cases present themselves during the entire year, epidemics occurring during the months of January and February, our winter months, giving us the severer types of cases, and also in the summer months, June and July, the mortality in these two months being somewhat less.

The course of this disease is generally about two weeks, however, I have observed cases of three and four weeks' duration, less frequently of one week, and in rare cases of eleven days' duration.

Diagnosis in the beginning is very difficult, as it is very easily confounded with the onset of some of the other infectio-contagious fevers, after the appearance of the characteristic symptoms.

[illegible] depends upon a great many factors. As stated before [illegible] pathogeny. What appears to me

intellectual or physical, in fact, excesses of all kinds, unhygienical surroundings, collection of a number of filthy persons in such surroundings. A very common way of contagion is that acquired by nursing others of the same sickness (typhus), during the convalescent stage.

I have also noted cases of mountain fever occurring after eating an excess of green or partially decayed fruits. At the present time, here in Mexico and also in a number of our most improved cities, some of our most celebrated physicians are working independently of each other to isolate, if possible, the supposed germ of this malady.

I shall now endeavor to explain my reasons for believing water the principal conveyer of typhus. In the sporadic cases which I had opportunity to observe, outside of the other predisposing causes, it was forcibly impressed upon me that the chief cause was the impure water which was consumed by almost all of the cases. It is a very difficult matter for these people to procure filtered water, the water used is not even boiled. On the contrary, we find that in houses where boiled and filtered water is used it is extremely rare to find a case of sporadic typhus.

Allow me to mention another instance exemplifying my foregoing statements.

In an epidemic which visited the town of Cerro de San Pedro, I being physician and surgeon to the mining companies of that place, it was directly traced to the impure and contaminated water used. Since this condition was remedied there has been no new epidemic.

Although the above facts do not conclusively prove my theory, yet, taking all of the facts into consideration, my theory seems to be pretty well borne out.

The results obtained from a study entitled "The Potable Waters of the Capital of San Luis Potosi" taken from a chemical standpoint arranged by Prof. Isidro Palacios, and the bacteriological from José T. Cayon, M. D., of Mexico City, we deduce the following: It was seen that from twelve (12) samples examined, two (2) were only free from the typhoid and coli bacilli. These waters are, however, rarely used by the population of San Luis Potosi, as filtered and boiled water are almost entirely used. Now let us see what may be deduced by the foregoing:

Something and very important; there being but few sporadic cases where the filtered or boiled water is employed, and on the contrary there being an abundance of cases where it is not employed makes my theory hold good. It is therefore to be accepted that contaminated

water is the principal, if not the sole conveyor and propagator of mountain fever.

I also call attention to the following facts: It is readily noted that the physician in attendance seldom becomes infected. What is this fact due to? He remains hours at a time with the patient, comes in contact with him, auscultates him, and performs sundry other duties.

Not so with the people of his immediate household, or the nurse in attendance, they are often obliged to live, eat, drink and sleep in the house of the patient, and by the time of convalescence, when exhausted from the continual vigil, become infected, and may they not also have been infected by the impure water of that same house?

During the last epidemic which visited this city, during the months of June and July, out of sixty cases reported I had the pleasure of attending seven, of the seven I observed that four with absolute certainty were directly due to the drinking of contaminated water.

In a school house in the neighborhood of San Miguelito, this city nine cases occurred, all of them traceable to the drinking of water from a certain well close by. By order of the board of health the well was closed, after which, no other cases occurred.

I could name a number of other cases, which, although not proving conclusively, yet tend to point to the fact that water is the carrier of the infection in the great majority of cases.

In conclusion allow me to point out the fact that the epidemic form is more prevalent in the time of the year when the subterranean water is at its deepest level, leaving the germs free to infect the drinking waters.

1st. It is my belief that the germ of mountain fever is of the same family as the coli bacillus and that of Eberth and should be looked for in the water used by the infected individual.

2d. The best prophylaxis, to insure proper hygienic surrounding, is potable sterilized drinking water. San Luis Potosi is at the present time working out a plan to perfect her water supply.

3d. It is essential that the assisting physician procure, by all means in his power, water that has previously been sterilized or boiled in all of his cases in an infected district, combining all of the other precautions.

THE PREVENTION OF TUBERCULOSIS IN THE PRIMARY SCHOOLS.

By Dr. JOAQUIN COSIO, Mexico, D. F., Mexico.

This subject comprises two points not altogether different one from the other, the first is the prevention of the wasting disease in the schools, and the second the individual preservation of the scholars either predisposed or already suffering from some tubercular lesions, although not constantly contagious or transmissible to healthy boys.

I am going to commence giving some ideas relating to the etiology of tuberculosis pertaining to schools and the procedure of settling an accurate and early diagnosis, in order to be sure that a real and practical prophylaxis is going to result and many times also the recovery of the sick.

The direct inheritance of tuberculosis is so exceedingly rare, that a very few exceptional examples have been considered as a curiosity in the medical science. In most of these cases of apparent inheritance, there has been really contamination by living together, parents attacked with tuberculosis and children predisposed from debility or any other cause The contagion is so true that whenever a son is taken away from his tuberculous parents as soon as he is born and is cared for by a good and healthy nurse, he will surely escape the disease as long as he is not exposed to contamination from other source.

The so-called predisposition for tuberculosis is not very important, because the children of tuberculous parents might be delicate and weak, but if properly trained they will not be attacked by the disease. In fact the only way of contamination by tuberculosis is the contagion, and in the child as well as in the adult is always an acquired disease.

The penetration of the germ by means of the digestive tract, is of a relatively rare occurrence, because neither the meat of tuberculosis animals nor the cow's milk are very dangerous; because the meat contains very scarce tubercular lesions, if care is taken to separate the lymphatic, glands most generally contaminated, and the milk to be surely infective must be drawn from a cow with mammary tuberculosis or else being infected externally by numerous bacilli.

In Mexico the injections of tuberculin for detecting the bovine tuberculosis, are not generally used, and therefore some danger results from drinking the milk. In the city of Mexico and in most any place

in the Republic, the infants and children never take crude milk, and therefore even being contaminated, the Koch's bacilli that die at 75° C can never stand the boiling point of milk.

The contamination through the skin and the superficial mucous membranes is also quite unfrequent.

The principal and almost unique manner in which the child is infected, is through the respiratory tract where the germs arrive directly inhaled by respiration.

In the primary schools the contamination of tuberculosis takes effect in the same way as in other places; but there are some peculiarities amongst the characteristics of scholars.

Whenever we observe cases of tuberculosis in a school, we must find out their origin and ascertain whether they have developed in the establishment or have been contaminated beforehand in the household. This is quite a difficult thing to ascertain at times, because it is not usual to practice the searchful and minute examination of every boy that enters the school ignoring, therefore their state of health.

Contagion in the schools is a real fact and it is caused by the transmission from the schoolmasters, the employes and the scholars themselves when they are affected by tuberculosis, but it is necessary that the disease be quite advanced, the so-called open tuberculosis with abundant and infectant expectoration facilitating its spreading by carelessness or bad hygiene of pedestrians of the building.

The Mexican government has done much in the improvement of the school houses, has built special buildings entirely *ad hoc* and perfect hygiene from base to top, has adapted many other houses for the purpose and has better and better places for schools.

[illegible] houses in the city of Mexico are never [illegible] have [illegible] extensive [illegible] the quartering [illegible] during the vacations [illegible] such congregations [illegible] germs [illegible]

[illegible] schoolmasters and [illegible] also [illegible] sick students because the [illegible] with expectoration [illegible] they suffer most frequently [illegible] and articular lesions and principally of the lungs [illegible] they are not so [illegible] excluded immediately [illegible].

[illegible] the saliva, the excretions of the

during the school period, have begun formerly in the household, and are not recognized until they become evident in the school.

Many of these outbreaks of the hidden tuberculosis are not contagious because they are not open, but others are transmissible and must be combated by the collective prevention, separation of the sick, disinfection, etc.

The only way to prevent tuberculosis in the schools is to discover the disease from its very beginning—that is to say, the making of an early diagnosis in school masters, employes, and students. No master or servant would be allowed to enter the school if he is sick or suspicious and must be thoroughly examined to prove his fitness in regard to health. The usual means of diagnosis will be recommended.

Relating to the scholars, if the lesions are advanced and the symptoms clear, the question is an easy one, but there is difficulty in many cases of latent tuberculosis, principally those where the peritracheal and peribronchial bronchiatic glands are affected.

The ideal would be to make a complete and individual examination of every boy before going to school, giving special attention to the weight and length of the body, to the circumference of the chest and to the relation between the age and strength.

It is necessary to determine the size of the thorax, stating the thoracic index, or the quotient resulting from the division of the transverse diameter by the antero-posterior.

The separation of the lower border of the thorax in front, that is, the costo-sternal angle measuring 75 to 80 degrees in children, is very useful in cases of tuberculosis as it narrows to 60, 50 or 45.

The circumference of the chest affords some valuable data if compared with the normal capacity corresponding to the same age.

The vitality index, or the quotient resulting from dividing the circumference of the thorax by the length of the body and then multiplying by 100, omitting to begin the cipher in units, has been recognized of some value.

The measurement of the body's force, that is to say, the approximate measurement by dynamometer representing the physical aspect in relation to weight and expansion of the chest and thorax, is very useful to make the examiner suspect that a boy might be sick or any wasting disease. Of course these relations change according to the different ages and countries, but we have in every place the normal basis to depart from, and whenever a child or boy is not close to the normal cipher it will be necessary to examine him closely and carefully to be sure about his good or bad health.

In the section of school hygiene belonging to the direction of pu-

mary instruction in the city of Mexico, the physician in charge has been examining many children inscribed in the primary schools; but it would be much better to make this examination before being admitted to the courses of instruction.

It is quite easy to measure and weigh every boy or girl, and if they seem defective, they will be examined more completely, and only then if the result is satisfactory will they be allowed to go to school.

The clinical examination will consist in the usual methods, giving particular attention to changes in the inspiration, to special findings in the deep lymphatic glands, regarding percussion and ausculation. The so-called micropoly-adenia must arouse the suspicion of tuberculosis.

Sometimes the peritracheal and peribronchial glands are not very large, or else they are covered by healthy lungs and therefore will not be discovered by the clinical examination. In these cases the radioscope might become necessary and would reveal shadows beyond the vertebral and cardiac areas.

The examination of the blood for lymphocytosis is also valuable.

The tuberculin injections are not advisable in children.

It is necessary, of course, to have a sufficient number of medical inspectors.

In the Federal District of the Republic of Mexico only five physicians inspect 367 official schools, 45,634 students, and 1,783 school masters. If we add to these numbers 219 private schools — 13,145 scholars and 986 masters we have a total of 586 primary schools, 2,779 school masters and 58,777 students that is 11.33 per cent. of the population.

There were in the whole Republic of Mexico in 1906, 11,519 primary schools, 19,131 school masters and 738,813 students, and the medical inspection is done only in some of the principal cities.

It would be necessary to increase greatly the number of medical inspectors, to instruct them about their new and important duties, to detect and control not only tuberculosis but also other diseases.

The medical inspection should be repeated at least twice a year for tuberculosis, and whenever necessary for other contagious diseases.

Every student sick or suspicious should be separated immediately and not readmitted until declared completely cured.

The medical inspectors should give lectures on hygiene and on prevention of tuberculosis (this has been done lately in Mexico, the speaker has begun a series of conferences in the schools) they should watch over the good conditions of the school houses and its different dependencies, to keep guard of all the hygienic details.

The measures to be taken against the bacillus and t

hygiene, education of the students and teachers, installment of spitting boxes, [illegible] of the [illegible] before sweeping, washing and scrubbing of the floor, walls and ceilings two or three times a month, complete disinfection of the buildings, books, utensils, toys and so forth wherever there has been a patient with tuberculosis.

Respecting [illegible] the students individually, the best [illegible] [illegible] lessening of physical and mental [illegible] students with brilliant [illegible] physical exercises would have [illegible] respiratory organs.

Whenever [illegible] already [illegible] very slightly yet, being [illegible] malnutrition [illegible], [illegible] will have better food and less [illegible] necessary particulars for this [illegible] outside of the school will be [illegible] nourishing [illegible], powdered meat and milk [illegible] winter and substance preparations [illegible].

It [illegible] to separate completely [illegible] and send them to their homes, if they can live there a [illegible] attended by a doctor, but as such is not the case [illegible] the government ought to have country schools [illegible] on the mountains or on the coast [illegible] the diseases.

When [illegible] in other [illegible] advanced [illegible] and [illegible] will be radically separated from the [illegible] should be [illegible] with [illegible] will live in the open air [illegible] radically [illegible]. The kindergarten [illegible] have given good results. The vacation [illegible] although [illegible]. The ideal would be to have schools [illegible] amidst the woods of invigorating [illegible]. [illegible] Charlottenburg [illegible] forest. Next year in May [illegible] Charlottenburg the schools [illegible] a day.

[illegible] and great [illegible] they may [illegible] yes [illegible] tell [illegible]

THE ACTION OF A HIGH DRY CLIMATE IN THE CURE OF TUBERCULOSIS.

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The value of a high dry climate in the cure of tuberculosis, is generally admitted to be considerable; as evidence of this value we have many facts: the natives of such regions are comparatively free from tuberculosis, and the same is largely true of those who have later emigrated to them. Again, many who have suffered an attack of tuberculosis and emigrated to the high dry regions have recovered or have had their lives considerably prolonged. Finally, the United States government with its extreme conservatism in matters of health, has established two sanatoria, one for consumptive sailors, the other for consumptive soldiers, in the high dry climate of New Mexico. The results obtained at these sanatoria have been most gratifying to the officers in charge.

EARLIER EXPLANATIONS OF CLINIC ACTION.

Many explanations have been offered to account for the favorable action of high dry climates, but up to the present time none of these have proved satisfactory in accounting for the facts observed. Among these explanations the following may be considered as the more important:

A. A high dry climate leads to greater lung capacity and increased respiration which results beneficially for the patient. The observations of Maltby (Hadley Climat. Bul. Vol. III, No. 2, 1901) seemed to confirm this view but more recent work by the writer has shown that the spirometer used was defective and gave too high reading. It is very doubtful whether any material increase results, and, in some instances at least, an actual decrease takes place. At any rate, the lung capacities of the natives of these regions are as a rule below normal (data to be published later).

Perhaps a better understanding of the above assumption is gained by viewing the matter from a physiological standpoint. The lungs are organs intended primarily to provide the blood with the oxygen necessary to oxidize tissues and liberate energy: and secondarily, to remove certain wastes. For these purposes a large margin of safety

...capacity is provided, the average inspiration and expiration being ... inches while the total capacity is approximately ... inches. This margin of safety (500%) more than counterbalances the rarefaction in the air which at an altitude of 5,000 feet ... Again in normal respiration ... a large ... in the amount of oxygen ... the ... is ... There is, then, no valid reason ... high altitudes.

... has not been substantiated ... the ... high dry climates is exceedingly small. ... patients ... breathing highly ozonized air have not met with ... results.

... generally accepted assumption is that the dry air assists ... bringing the ... to the lungs. When it is remembered ... the air in the lungs is saturated with water vapor at all ... it is hard to understand why this assumption was ever ... The ... of the tuberculous lesion in the lungs precludes ... considerable desiccation taking place.

... have assumed that the sparse population and lack of ... breathing of pure fresh air which is of unquestionable ... that the air is equally pure in ... woods and prairies in low ... to ... cannot therefore be considered distinctive for ... climates.

... sunlight especially in blue, violet and ... climates has also been held to be the beneficial factor. ... increase exists, but recent observations ... influence. The writer has carried ... with ... glass pegs in blue green, ... but as yet there is no evidence decidedly ... The ... is a difficult one and ... there is no reason to ex...

... high dry climate affects ... and exercise the real benefit ... already discussed. It has ... there ... may have little or ... able to do exercise a ... other factors such as change ... life exercise a helpful ... even more the

importance of these factors, but it remains true that practically all of them may be provided in other places.

There is, then, no adequate explanation to account for the important fact that high dry climates are especially favorable in their action on tuberculosis. The attempt will be made to give a rational explanation which it is believed will account for the facts observed.

PROPOSED EXPLANATION OF CLIMATIC ACTION.

The most characteristic difference between a high dry and low moist climate is the great difference in range of temperature; this is small in low moist places, and usually great in high dry ones where it may reach 30° to 50° F. daily. If we compare St. Louis as an example of the former type with Colorado Springs as representing the latter, we find that in the former the nights in summer are uncomfortably warm and afford poor opportunity for refreshing sleep, while in the latter the nights are always cool and invigorating. This point counts for perhaps more than all the other so-called hygienic factors put together; while not new, it has never received adequate emphasis. But there is also a difference in the above places in the winter climates, although not so marked as the one just treated; this is that the daily variation continues to be greater at Colorado Springs. This variation acts as a stimulation to the body and invigorates it, thus enabling it to better combat the disease. This stimulation may be better understood by comparing it with a cold bath the invigorating qualities of which are well known. In this factor — the great daily temperature variation — really lies the great virtue of a high dry climate, and so far as the writer is aware has not been pointed out before.

A number of observations lead to the above conclusion. In my work on blood changes due to high altitude (Hadley Climat. Bul. Vol. III, No. 9) it was shown that the increase in red blood cells was temporary.

TABLE I.—BLOOD COUNTS OF SPECIAL CASES AT HIGH ALTITUDES

Date	Time	Weight	Sp. Gr.	Hemoglobin (per cent.)	Red Cells (per c.mm.)	Colorless Cells (per c.mm.)	Time on High Altitude (days)
Case 55							
7 24 02	10 30	125	1 060		5,573,000	12,000	0
7 28 02	10 00		1 060	85	6,155,000	12,000	12
7 31 02	2 30				6,431,000	12,000	15
8 4 02	3 00				5,791,000	11,000	19
12 10 02	10 00	123	1 060	87	5,395,000	14,000	
Case 75							
9 20 02	3 00	150	1 061	84	5,693,000	6,000	4
1 27 02	11 30		1 061		5,382,000	10,000	11
10 1 02	11 30				5,222,000	14,000	15
10 21 02	11 30				5,928,000	14,000	35
10 11 02	11 30		1 062	78	6,280,000	13,000	45
11 20 02	10 00		1 063	82	5,501,000	6,000	80
12 11 02	3 45	135	1 061	82	5,214,000	6,000	88

TABLE 2. — BLOOD COUNTS OF RABBITS AT HIGH ALTITUDES.

Date.	Time.	Weight.	Sp. Gr.	Hemoglobin (per cent.).	Red Cells (per c.m m.).	Colorless Cells (per c.m m.).	Days in Mountains.	Days After Return to Albuquerque.
Rabbit 16.		Lbs.'						
8/21/02	9:30	4½	1.056	78.0	6,666,000	4,000	.....	.....
8/28/02	3:00	.....	.....	.....	7,742,000	13,000	5	.....
11/ 8/02	1:00	5¼	1.060	86.0	6,671,000	8,500	72	.....
12/ 5/02	1:30	6¼	1.058	86.0	6,786,000	2,500	.....	27
Rabbit 18.								
8/21/02	1:45	6¼	1.057	73.0	5,849,000	9,000	.....	.....
8/29/02	10:30	.....	.....	.....	5,875,000	14,000	6	.....
11/ 8/02	3:30	7¼	1.058	85.0	7,760,000	7,500	72	.....
12/ 6/02	3:30	8	1.056	84.0	7,391,000	4,000	.....	28
Rabbit 19.								
8/21/02	3:00	3¼	1.058	73.0	6,022,000	10,000	.....	.....
8/29/02	9:20	.....	.....	.....	6,929,000	11,000	6	.....
11/ 8/02	11:00	5¼	1.061	80.0	6,835,000	7,000	72	.....
12/ 4/02	2:45	5.6	1.060	81.0	6,702,000	6,500	.....	26

The above data could not be interpreted at the time. The experiment with rabbits sent to higher levels was continued, but accident brought it into the cold of winter. The rabbits were kept in a warm, sunny basement. To make the experiment a fair test, the animals were first placed in the cold, outdoor temperature before sending them to the mountains.

PART 2

The results in Table III showed that on placing the animals in the cold, they underwent the altitude phenomena, namely, increased specific gravity of the blood, increased volume of red cells, and increased number of red cells; but when the animals were sent to a higher level no further increase in these factors took place. It was also noted that blood counts are higher in winter than in the summer season as shown in the following table.

TABLE 4. — COMPARATIVE BLOOD COUNTS IN SUMMER AND WINTER SEASONS.

Case No.	Sex.	Age.	Condition.	Summer.				Winter.				
				Date.	Hour.	Sp. gr.	Red cells.	Date.	Hour.	Sp. gr.	Red cells.	Increase in winter.
27	Male	Adult	Tuberculous; recovered ...	Aug. 5, 1900	11.00 A.M.	....	4,737,000	Dec. 19, 1900	10.45 A.M.	1060	5,351,000	614,000
34	Male	28	Tuberculous; recovered. ...	Aug. 4, "	6.15 P.M.	1055	3,640,000	Jan. 22, 1901	11.00 A.M.	1058	5,640,000	2,000,000
21	Male	Adult	Tuberculous.	June 20, "	9.30 A.M.	....	6,242,000	Jan. 24, "	12.15 P.M.	1061	5,738,000	—504,000
28	Male	25	Tuberculous	Aug. 1, "	2.45 P.M.	1060	5,081,000	Jan. 28, "	2 30 P.M.	1062	5,413,000	332,000
22	Male	41	Tuberculous	July 18, "	9.30 A.M	....	5,737,000	Jan. 30, "	10.40 A.M.	1060	6,200,000	463,000
32	Female	22	Pneumonia; recovered	Aug. 3, "	11.40 A.M.	1057	5,711,000	Feb. 2, "	11.00 A.M.	1059	5,920,000	209,000
31	Female	22	Tuberculous; recovered.....	Aug. 3, "	9.30 A.M.	...	3,422,000	Feb. 2, "	11.15 A.M.	1058	5,035,000	1,613,000
10	Male	Adult	Tuberculous.	May 11, "	10.15 A.M.	....	6,072,000	Feb. 4, "	8.45 P.M.	1058	5,980,000	—92,000
6	Male	22	Normal	May 23, "	2.00 P.M.	....	5,000,000	Feb. 13; "	11.00 A.M.	1062	5,431,000	431,000
33	Female	27	Tuberculous; recovered.....	Aug. 3, "	4.30 P.M.	1055	4,147,000	Feb. 23, "	2.30 P.M.	1060	4,844,000	697,000
24	Male	15	Normal	July 20, "	12.00 M.	...	5,404,000	Mar. 3, "	3.15 P.M.	1062	5,493,000	89,000
26	Male	15	Normal	Aug. 25, "	10.00 A.M.	....	4,764,000	Mar. 7, "	2.20 P.M.	....	5,162,000	398,000
20	Female	Adult	Tuberculous; recovered.....	July 19, "	11.00 A M.	....	4,822,000	Mar. 21, "	3.30 P.M.	1058	4,835,000	13,000
											Average	485,000

Further blood counts made during the summer season at an altitude of 7,000 feet were normal or below as shown in Table 5. All these cases, however, had resided some time at high altitudes.

TABLE 5.—BLOOD COUNTS OF CASES TAKEN AT CAMP WHITCOMB—ALTITUDE 7,000 FEET

Case Number	Sex	Age	Condition	Date	Time in Mountains	Number of Red Cells per Cu mm	Number of White Cells per Cu mm	Specific Gravity	Red Cells	
									Above Normal	Below Normal
5	M	44	Tuberculous Bacilli few	July 1 1920	35 days	5,431,000	14,800	1062		69,000
7	M		Tuberculous Well	August 5 1920	65 "	4,737,000				763,000
29	M	2-	Tuberculous	1 1920	101 "	5,031,000	14,000	1060		469,000
29	F	26	Tuberculous	2 1920	22 "	4,360,000	14,800	1055		640,000
30	M		Recovered from Pneumonia	2 1920	61 "	4,578,000	22,200	1055		922,000
31	F	22	Weak Lungs Tuberculosis	3 1920	31 "	3,422,000	8,000			1,578,000
32	F	22	Slight Pneumonia Well	3 1920	31 "	5,711,000	15,600	1057	711,000	
33	F	27	Tuberculous Well	3 1920	20 "	4,167,000	8,000	1056		854,000
34	M	29	Tuberculous Well	4 1920	92 "	3,640,000	9,200	1056		1,360,000
35	M	30	Normal	5 1920	" "	4,092,000				1,008,000
3	M	29	Tuberculous Well 1 years	7 1920	12 "	5,167,000				833,000
37	F		Tuberculous Well "	24 1920	21 "	4,831,000	22,000			169,000
37	M	39	Normal	" 24 1920	21 "	5,657,000			157,000	
39	M	36	Normal	" 25 1920	60 "	4,794,000				726,000
39	M	37	Tuberculous No Bacilli	" 31 1920	41 "	5,764,000		1064	264,000	
40	F	25	Normal	Sept 1 1920	41 "	5,264,000			264,000	

Again, blood counts of the same persons, taken in winter are higher than those taken during the warm summer season, as shown in Table 6.

TABLE 6. — COMPARATIVE BLOOD COUNTS IN SUMMER AND WINTER SEASONS.

Case No.	Sex.	Age.	Condition.	Summer.				Winter.				
				Date.	Hour.	Sp. gr.	Red Cells.	Date.	Hour.	Sp. gr.	Red Cells.	Increase in Winter.
27	Male	Adult	Tuberculous; recovered	Aug. 5, 1900	11.00 A.M.	....	4,737,000	Dec. 19, 1900	10.45 A.M.	1060	5,351,000	614,000
34	Male	28	Tuberculous; recovered	Aug. 4, "	6.15 P.M.	1055	3,640,000	Jan. 22, 1901	11.00 A.M.	1058	5,640,000	2,000,000
21	Male	Adult	Tuberculous	June 20, "	9.30 A.M.	...	6,242,000	Jan. 24, "	12.15 P.M.	1061	5,738,000	—504,000
28	Male	25	Tuberculous	Aug. 1, "	2.45 P.M.	1060	5,031,000	Jan. 28, "	2.30 P.M.	1062	5,413,000	382,000
22	Male	41	Tuberculous	July 18, "	9.30 A.M.	...	5,737,000	Jan. 30, "	10.40 A.M.	1059	6,200,000	463,000
22	Female	22	Pneumonia; recovered	Aug. 3, "	11.40 A.M.	1057	5,711,000	Feb. 2, "	11.00 A.M.	1059	5,920,000	209,000
31	Female	22	Tuberculous; recovered	Aug. 3, "	9.30 A.M.	....	3,422,000	Feb. 2, "	11.15 A.M.	1058	5,035,000	1,613,000
10	Male	Adult	Tuberculous	May 11, "	10.15 A.M.	..	6,072,000	Feb. 4, "	3.45 P.M.	1058	5,980,000	—92,000
6	Male	22	Normal	May 23, "	2.00 P.M.	...	5,000,000	Feb. 13, "	11.00 A.M.	1062	5,431,000	431,000
33	Female	27	Tuberculous; recovered	Aug. 3, "	4.30 P.M.	1055	4,147,000	Feb. 23, "	2.30 P.M.	1060	4,844,000	697,000
24	Male	15	Normal	July 20, "	12.00 M.	...	5,404,000	Mar. 3, "	3.15 P.M.	1062	5,493,000	89,000
38	Male	15	Normal	Aug. 25, "	10.00 A.M.	...	4,764,000	Mar. 7, "	2.20 P.M.	....	5,162,000	398,000
20	Female	Adult	Tuberculous; recovered	July 19, "	11.00 A.M.	..	4,822,000	Mar. 21, "	3.30 P.M.	1058	4,835,000	13,000
											Average	485,000

These and other data lead to the conclusion that "cold is an important factor in accounting for the blood changes due to high altitude" (Am. Jour. Med. Sci. Aug. 1903).

The next experiment was to place rabbits at a somewhat elevated temperature (95° to 105° F.) in an incubator. These rabbits while remaining apparently healthy, showed diminished, rather than increased blood counts. The animals were placed in the incubator March 31st and kept there until the experiment ended.

TABLE 7.—BLOOD COUNTS OF RABBITS KEPT AT ELEVATED TEMPERATURE AT 95° TO 105° F.

No.	Date	Weight in grams	Gain	Hemoglobin %	Red cells per cu. mm.	White cells per cu. mm.
20	March 4	617	14	85	6,792,000	5,000
20	March 14	622	5	85	6,816,000	10,000
20	April 4	624	14	85	6,264,000	11,000
20	April 25	670	46	85	6,448,000	8,000
21	February 24	971	100	80	5,654,000	5,200
21	March 14	971	106	81	5,160,000	13,000
21	April 4	982	100	82	5,376,000	8,000
21	April 25	990	107		4,920,000	7,000
22	February 24	630	103	83	6,732,000	6,000
22	March 14	634	104	81	6,528,000	8,000
22	April 25	695	165	72	5,000,000	11,000

The importance of the above observations were not appreciated until other [illegible] evidence pointed to the fact that the temperature change was the [illegible] in the climatic problem.

[illegible] placed in colored glass [illegible] exposed to the sun's rays, bled in a much shorter time [illegible]. While the biological conditions in these cells may [illegible] it is believed that the high temperature pre[illegible] was the main [illegible] other words the elevated [illegible] of the disease.

[illegible] as the above [illegible] during the fall and winter [illegible] but [illegible] during the warm weather

This observation was confirmed by the clinical experience of a number of physicians.

In order to understand the facts presented, it is only necessary to recall the physiological effect produced by heat and cold. Heat tends to diminish bodily exercise and activity as shown by the sluggishness of tropical man. This sluggishness causes a decrease in the elimination of waste products which exercise a detrimental influence on the body. On the other hand, cold when not excessive, stimulates body activity and heat production: as a result more food is required, digestion improves, and the body lays on fat as a reserve to meet the greater demands for heat. At the same time elimination of body wastes is more complete owing to greater activity, and hence, the physiological functions are better performed.

The influence of cold is shown most markedly by the woodsmen of the north. These men are out in the cold all day, and live on plain but nutritious food. The result is that almost invariably they lay on flesh during the cold winters.

It is scarcely necessary to make the application of these facts to the cure of consumptives. So long as the consumptive has sufficient vitality left to respond to the stimulative action of cold, he is almost certain to improve in bodily strength and vigor which is the first essential in the conflict with disease. If the patient's fighting forces are increased he is almost certain of gaining a victory; but when these forces are depleted by warm climates or other causes, then victory belongs to the invading tubercle bacillus.

That consumptives may do well in cold climates is shown by the gratifying results afforded at Muskoka, Canada, Saranac Lake, N. Y., and White Haven, Penn. There seems to be a feeling at Dr Trudeau's sanitarium that one winter is worth two summers for the patient.

While intense cold may be endured even with profit by some consumptives, others are, perhaps too sensitive to bear the continuous application, but they may be able to withstand and profit by the daily vibration of heat and cold afforded by the high dry climates. At any rate, the general verdict of a high dry climate appears to be in this direction. This point appears to have escaped [illegible]

If the above explanation of the action of a high dry climate is correct then we shall be in a better position to profit by such a climate. Only those with sufficient vitality to respond to the temperature variations can hope to be benefited and physicians must make a careful selection of suitable cases for [illegible]

must have their remaining energy depleted by the extra demands placed upon the body.

Perhaps the greatest benefit to follow from this presentation is the opening up of a new field of work, viz., the importance of temperature change in other diseases than tuberculosis. Plans are under way for the carrying out at an early date of a large series of experiments in the field.

To summarize: The action of a high dry climate in the cure of tuberculosis, consists essentially in the stimulation afforded to the body by the daily variation in temperature; altitude, dryness, and sunlight are important mainly as being instrumental in causing this daily variation. These factors by themselves exercise a certain hygienic influence, but the temperature change produces a true physiological reaction. Incidentally the variation in temperature affords cool nights with accompanying refreshing sleep. Together, these two factors afford the patient a vantage ground from which to wage a more successful combat against the forces of the disease.

UNCINARIASIS IN FLORIDA.

J. J. KINYOUN, M. D., PHILADELPHIA, PENNSYLVANIA.

When I began this study, I was of the opinion that from the abundance of material which was spoken of by my professional friends and colleagues, that it would be only a short while before a mass of data would have been accumulated for a comprehensive study of the hook-worm infection in the state.

I soon found that I had miscalculated, or underestimated the task; particularly was this so with regard to the collection of material and data from the clientele of the practitioner. If on the other hand I had confined my attention to the hospitals and other public institutions, the task would have been much easier. But I had a double object in view; one to ascertain the prevalence of the infection and the other to see just how far the average practitioner would be interested in such an investigation, and moreover to determine just how far they were interested in the eradication of the infection.

I think I am safe in making the statement that the matter is viewed with indifference by the majority of the practitioners; some are interested, only when a case of the infection presents itself; others are interested all the time, but find like myself numerous obstacles in the way of success. I must here tender my thanks to the few practitioners of the state who have so generously placed their cases at my disposition as well as aiding me in procuring material for this study. It is not my purpose to enter into a discusson of the etiology of the infection, as I have but little to offer other than what already has been said by those who can speak with more authority than myself. So instead I will devote what little I have to say to economics and the public health side of the question, as I am of the opinion that this is now the most important; a practical application of the knowledge we possess regarding the parasite.

DISTRIBUTION OF THE HOOK-WORM IN THE STATE.

As has already been pointed out by Stiles (1), Terry (2), Freeman (3), and others, hook-worm infection is wide spread in Florida. The records of the laboratory for the past three years show that cases exist: Jacksonville 27, Sandford 1, Welborn 1, Webster 1, Fort Myers 2, Daytona 2, White Springs 1, Sebastian 1, La Cusse 1,

Key West, and Dade County, a total of thirty-nine cases. Reports have also been received from Stark, Miami, Fort Pierce, and Tampa, where the disease has been determined by microscopical examination [illegible]

As to the extreme western part, as only one report has been made [illegible] shall probably find it does exist as "dirt eaters" have been reported from this locality as far back as 1845. I am inclined to think that the reason why it has not been recognized is because of the lack of interest rather than from the fewness of cases. Certainly the conditions for the propagation of the parasite is as favorable here as in other parts of the state. In Taylor County and around Perry, Dr. Williams has a record of over 300 cases collected within the last two years, and Dr. McCall reports thirty cases from the same place. He was from a rural population. The Island of Key West [illegible] few cases. In fact I did not see a single clinical case among [illegible] from. [illegible] probably introduced by the Cuban [illegible] but does not appear to affect the [illegible] the character of the soil appears to [illegible] the worm, the coral sand [illegible] having a very rapid [illegible] the luxuriant vegetation. [illegible] explanation.

[illegible] not been any systematic investigation undertaken to [illegible] the prevalence of the infection within a given population. [illegible] that can be obtained are the presence or absence of the eggs in a given case and in cases where the infection is suspected. We have [illegible] that a locality in a given place may be infected or [illegible] the habitat of the worm. This we do know, [illegible] more widely prevalent than any other disease in the [illegible] interest.

[illegible] difficult to conceive how a [illegible] frequently the case. As to [illegible] conclusion has been forced on me [illegible] that very few physicians are [illegible] from them [illegible] and let them [illegible] the [illegible] implicit [illegible] the [illegible] state [illegible] the [illegible]

to you when inquiry is made about a case, "Johnny has always been puny, ever since he was a little boy, nothing ever seemed to do him any good." Among the poorer class of whites this is a common belief that nothing ever does the puny child any good. Then the indifference and the want of preparedness in having an honorarium for the physician is not uncommon, usually the rule; this is a contributing cause for the apparent neglect. There is a prevalent belief among this class of whites, just like it is in other states, that there is a great efficacy in the patent medicine frauds, and they resort to these, for the treatment of the hook-worm anaemia. Failing to get results, become resigned, and do nothing until the case becomes so bad that a physician is called.

On the other hand, there are not a few cases of infection among those in more fortunate circumstances in whom the infection is not suspected. Many of these are treated for another disease, usually malaria, particularly is this so if there is a marked anaemia. It is held by some that at least 60% of the white children of the state have hook-worm infection. I have not found it so around Jacksonville, Tampa or Miami. It may exist to this degree in some parts of the state, but I have not observed any such number clinically, even in those portions where the infection was severe. This however can be said, we can have all the gradations of infection from the mildest to the severe in the same locality, even in the same family; in fact the infection resembles in this respect very closely that of malaria. It may have its periods of advance and recession, and may be modified by seasonal or other environment. I have seen examples of this in the same family; some members are affected severely, while others slightly or not at all.

And furthermore, all were discharging large numbers of hook-worm eggs. This condition might be explained by the fact that all cases were not infected at the same time, but on the other hand I know of instances where children were formerly typical pictures of hook-worm anaemia, when placed under good surroundings, given a full regimen of wholesome food, and tonics had apparently recovered at the end of a few months treatment. In fact it would not be suspected they were suffering from the hook-worms. I had an opportunity to examine the children of two orphanages in Jacksonville. There were 39 in all, whose ages were between 5 and 14 years. All were white. In one of these, a sectarian institution, there were 20 inmates, all girls, whose ages ranged from 9 to 14 years, quite a number had been inmates for several years. None so far as could be ascertained had ever been treated for hook-worm anaemia. I found four cases among

these. A percentage of 20%. In the non-sectarian institution, with 19 inmates, (7 boys and 12 girls), whose ages ranged from 5 to 14 years, there were ten cases; a percentage of 52.6%. These 39 cases when taken together, a total percentage of 45.3%.

It will be observed that there were more cases found among those in the non-sectarian institution, which I think can be explained by the fact of the source from whence the children were drawn, and the length of residence in the institution. Children in the secular institution were nearly all city or town raised; whereas those in the non-secular institutions were nearly all from the country. I was informed by the matron that those children in whom were found the hook-worms, were quite anaemic on their admission to the orphanage, but had since their admission begun to improve until now they did not resemble the same children. The one point in particular which I desire to emphasize is this: That cases of hook-worm infection will often improve that the infection will not be suspected. In fact I could not have diagnosed but one of the cases by the clinical appearance.

A careful examination of all these cases showed that they were under developed, and were of slow mentality. I had an opportunity to examine specimens from 150 persons in Jacksonville, this number included the following: 60 white adults, 45 white children, and 45 colored adults. In the group of white adults, there were 10 infections or 16.6%. Among the white adults there were 19 infections or 42.2%. Among the colored adults there were 8 infections or 17.7%. This group of cases gave a much larger number of parasitic infections than has heretofore been reported in the United States, as there were found 50 infections; Uncinaria 37, and of other intestinal parasites 19, which will make for the hook worm 37.03%. And for the others 12.6%. Even if we exclude the hook-worm the percentage of infections is still greater than those of Stiles, 10.1%. But this is not unexpected, as the conditions for parasitic infections in Florida as far superior than anywhere I have seen save in the Philippines. The following parasites were found. Hook worms in 37 cases, whip worms in 4 cases, eel worms in 2 cases, Strongyloids stercoralis in 4 cases, pin worms in 5 cases, Taenia solium 1 case, Taenia saginata in 1 case.

The white adult cases were taken from the hospitals of Jacksonville, and represented the most favorable part of the population as many of these had only been in the state for a short time, and moreover they were from the well to-do. The five cases found among these had resided in the state for several years or were natives. In no case did

I find an infection less than one year's residence. The same also applies to children.

With regard to the colored adults; these were all from the county jail, and had only been confined therein for a few days. These were recruited from all over the South, all who were found to be infected had resided in Florida for six months to several years, and also had come from other parts of the South where it is reasonable to suspect that hook-worm infection exists. These cases were of the nomadic type of the negro, the criminal class, who is constantly changing his abode. I examined 40 of these jail-birds and found 8 of these had hook-worm. This gives a percentage of 20% for this class, and a total percentage for the 45 negro cases 17.7%, just a little higher than was found for the whites. This is hardly a fair comparison, as many of the white cases were from parts of the country where hook-worm is not prevalent.

With regard to the clinical manifestations seen among the whites, and contrasted with the colored, there is a marked difference. The white evidently suffers to a greater degree than the negro. It is scarce if ever that you see a well marked clinical case of hook-worm disease among this race, while on the other hand, many cases are observed among the whites, particularly among the children and in the same community. The negro child is exposed to the same infection as the white child, and judging from the hygienic surroundings it is much in favor of the latter, yet notwithstanding this the infection if it does occur, is never severe.

The same also applies to the colored adult, only one case did I observe among the jail-birds, that I suspected had hook-worms from the clinical appearance. He did not have the hook-worm disease, but was suffering from something else. The anaemia is no criterion of hook-worm infection in the negro. In the 40 cases which were examined in the jail, I made a determination of the hemoglobin index, and found it to be below normal in all; ranging from 50 to 80%; the majority having an index from 65 to 70%. In the hook-worm cases, the index was from 50 to 80%; the case which had the greatest number of eggs in his feces, had an index of 80%. The anaemia in the white child is suggestive of intestinal parasites, and examination of the feces should always be resorted to, when such case is brought under the care of the physician. In all cases of children which came under observation those who were infected with hook-worm, were anaemic, but only slightly so; in two, there was a slight paleness of the mucuous membranes, but no haemic murmur. In fact this was so slightly apparent, that it would have been overlooked without the aid of the hemoglo-

[illegible] these cases were those already referred to which [illegible] admitted to the orphanage, they had [illegible] under a good regime and institutional care.

[illegible] emphasize the importance of [illegible] however slight, that [illegible] the care of the physician, as it will often be found to [illegible]

[illegible] any number of years, [illegible] given a history of having had at [illegible] The same also applies to [illegible] born in Florida and have spent their first [illegible] These persons suffer from these attacks [illegible] towns which are not well [illegible] these attacks have been [illegible]

Enquiries [illegible] negroes [illegible] having had attacks of ground itch [illegible] that the penetration takes place through the skin [illegible] the accepted view held by the majority, there [illegible] itself from the parasite, [illegible] number entered. It is reasonable [illegible] must have indefinitely [illegible] the manifestation of a hook worm [illegible] the ground itch are due to other [illegible] In all probability this is true, and [illegible] hook worm in many cases.

[illegible] the majority of the cases are infected [illegible] the avenues of infection are [illegible] the water supply in the districts where [illegible] derived principally from driven wells, [illegible] small. I am therefore of [illegible] the cases are contracted [illegible] would be had enough [illegible] as we have shown that [illegible] these are perhaps one of [illegible] negro who is here to-day, [illegible] all the damage he

certainly has and is now doing more than his part in dissemmination of the parasite. The uncinaria came with them from Africa, and has abided with them. If it had only staid with them, I am sure that the health history of the Southern littoral would have to be written differently. In truth the negro problem so far as the South is concerned, is far from being settled; and we are not much closer to its solution than we were a decade ago. The negro has almost entirely been considered as a negligible quantity, to be dealt with only when there is trouble.

He is the precursor of smallpox epidemics, he can have yellow fever so mildly that he is hardly conscious of the discomfort; he lives in such a way that he falls a ready victim to tuberculosis, and infects others. He brings the hook-worm with him from his ancestral-arboreal home and seems no worse than if he did not have it. He is the greatest disseminator of the malaria also. He certainly is a great problem, it matters not how you consider him. From a public health standpoint, he cannot be any longer neglected; and the sooner our legislatures are made to see the importance of measures for the better care and control of the race so much the better will it be for the whole population of not only the state of Florida, but the whole country as well. I do not wish to impose the sin of the two races on the one; as both are responsible for the continuation of the hook-worm disease, but all things considered, the negro by reason of his nature, his habits and disposition, person for person, distribute the infection over a larger area than the white.

Hook-worm anaemia exerts a profound impression on the population of the state. It seeks for its victims, the young, it saps away the life blood, dwarfing both the body and intellect. I fully agree with Stiles when he says, "Economically uncinariasis is very important. It keeps children from school, decreases capacity for both mental and physical labor, and is one of the most important factors in determining the present conditions of the poorer of the sand and pine districts of the South."

Florida will in my opinion be classed as an agricultural state, and will increase rather than diminish. There will be an increase of small communities rather than the tendency to larger, and the majority of the population will be rural. If this be true, it can be seen that as long as the people live in the country and not in towns there is more liability for them to be infected, than if the contrary obtained.

Any affection like this which so profoundly influences the health, development and future of the child should claim from all of us the most serious attention and effort. The future of the South largely

depends upon the growing child for its continuation and development of the institutions, their stability and perpetuity. We are now agitated [illegible] of child labor, all of which I most heartily endorse, but with all the evil attending child slaves of the factories, they are not more pitiful than what is constantly occurring in the state of Florida, from the hookworm infection.

The question now arises, what should be done?

In the first place it is a stupendous question which cannot be settled in short time, perhaps not within a decade, or even a generation. Practical measures will be slow in realization. But notwithstanding this we should begin the campaign not only in the state of Florida, but in all other states where the disease exists. If need be the general government should be asked to aid in so vital a condition as this, in the same way as it has done for Puerto Rico.

The state has a duty to perform for its citizens which cannot be [illegible] any one else. This duty can be best performed through [illegible] the board of health.

[illegible]

[illegible] are, I am glad to say, under way. The doctors of the state will be given an opportunity to interest themselves in the proposed [illegible] and it is hoped that the most progressive will enter into the [illegible] in planting [illegible] will be provided by the Board to make examination of material [illegible] and it need be to further assist the doctor [illegible] treatment of the case.

In addition to the above, which may be regarded as a preliminary step a [illegible] study should be made of the prevalence of the disease in [illegible] and [illegible] made to get as many of these interested as possible *and more than that keep them interested*, as we have to depend largely upon the doctor for ultimate success. It is far better to have the information regarding the hookworm infection reach the people through the [illegible] than to have it presented to them in a [illegible] However [illegible] all we can do to interest the local profession our best efforts will come to nothing. In such cases, I do not know of a better way than to take the public into your confidence. The press [illegible] a great deal. Arrangements could be made with nearly if not all the papers to give up space from time to time to good articles dealing

with the several features of the malady. *If need be pay for the space.* It will be a splendid investment of the public funds; in fact far better than it is often put to.

This should be supplemented by public lectures on matters pertaining to the public health, and in these refer to the hook-worm disease; supplement these lectures with lantern and other demonstrations that will make these health talks entertaining, and interesting.

The school teachers should not be omitted from the scheme, as they can be made to serve a most useful purpose in detecting the cases among the pupils, as they will perhaps be able to detect some of these which would not otherwise be suspected. The classroom and playground are two very effective means in forming your suspicions, and supplying cases to the doctor for a thorough examination. I found the playground one of the best places to study the children. I was often present at the impromptu games of ball that take place in the vacant lot after school has been dismissed. It was really interesting to observe how the boys grouped themselves; the active, ruddy boy, aggressive and leading; another the under-sized "clumsies" who could just play passable ball; and the last group who were always chosen last, poor specimens of boy; thin, weazened, and could not run, all anaemic. Their strong point was to play spectator. So also can it be said about the children at the schoolhouse; probably more can be learned there than anywhere else. In this work there is much to be done in the education of the people as the whole subject seems to have taken a wrong turn, and as the result the disease has come to be considered as a class disease; one which only affects the poorer class of the whites and further it is considered to be rather derogatory for one to acknowledge that he is suffering from it. Just as scabies is regarded.

The sooner the people are made to understand that all persons are liable to the infection and particularly so as long as the children are allowed to go barefoot and contract ground itch just so long will the children be liable to contract the disease. Of course there are other ways in which the parasite may gain entrance; and is greatly aided by unhygienic surroundings. This is a condition that the health authorities may be able to improve in time.

The most important of all I have left to the last; and that is the disposal of the infective material, the feces. It is most difficult to formulate a plan which would be applicable to the municipalities and the country districts. In fact other than a general recommendation as to the disposal of the feces, to prevent soil contamination, this must be considered as a local question and rules made to fit each case.

In closing this paper which has already been too long, I will say that the work of eradicating the hook-worm disease in Florida will require a long time and a large amount of money to accomplish the much desired result. What I have had to say regarding the hook-worm infection in Florida, applies equally well to other parts of the South where the parasite exists.

My thanks are due to Dr. Joseph Y. Porter, State Health Officer of Florida, for the privilege of making this investigation, and to my friends in Jacksonville who have so generously aided me.

YELLOW FEVER.

DR. EDUARDO LICEAGA.

PRESIDENT SUPERIOR BOARD OF HEALTH, MEXICO CITY, MEXICO.

Once more I come to render my report, no longer on the epidemics of yellow fever observed in Vera Cruz, Yucatan and the rest of the zone which used to be invaded by this disease, but rather on the excellent results of the campaign which we commenced four years ago against yellow fever.

My last report covered the period from the 16th of September, 1905, to December, 1906, and the present report will cover the period that has elapsed from the first day of the current year, to that on which this paper is read before the Association.

The results obtained through the efforts of the sanitary authorities of Mexico for stamping out the disease which forms the subject of my paper, can be condensed in a single phrase, as follows: *From January 1st, 1907, only five cases of yellow fever have been observed in all the Mexican Republic.* Two of these made their appearance in a small village called Paraje Nuevo, in the canton of Córdoba, and state of Vera Cruz. One of the patients remained there whilst the other went to Vera Cruz, where he was discovered on February 7th, and was at once properly isolated. He died in that port on February 9th.

Two were found in Mérida on March 19th and 21st, and another, which I consider doubtful, was observed in Vera Cruz on the sixth of this month and was discharged on the twelfth of the same.

You will therefore see that these cases were of a sporadic character, and that we have had no epidemic in any part whatever of the Republic.

The result is highly satisfactory, and in my opinion proves that the plan now followed in Mexico will eventually result in the final disappearance of this fearful scourge from our territory. It is true that we have followed methods which differ from those usually adopted in other tropical countries by continuing the campaign during the winter and by not, at any time changing the services as carried out in the two places that for centuries past have been foci of endemia: I refer to Vera Cruz and Mérida.

In the former of these cities, the service is carried on by dividing the city into four districts, each one under the charge and supervision of a physician, who has twenty-seven agents and nineteen servants under

his orders, as well as an engineer whose special duty it is to drain all swampy lands, to fill up hollows in the ground where pools of water might be formed, and if they cannot be filled up, to see that the water is covered over with a thin film of oil, and also to see that the house drains are properly connected with the sewer system which runs through the city. The staff also has to form the schedule of non-immunes who may be found in each district of the city, in order to visit them daily and be able to detain any one of them at the moment when he falls sick, and to take him to the proper place for isolation. At the same time that these agents make their domiciliary visits, they have to examine the water tanks and other receptacles, and if these are found to contain any larvæ, they are emptied, the larvæ destroyed, the water renewed and the tank or other receptacle is either properly covered with cloth or some other material, or else with a layer of oil.

Whilst all of these services have received the necessary attention, improvements have been made in the sanitary conditions of the city; water supply works have been constructed and a system of sewers has been laid down, which carries the city refuse out to sea, besides which, a commencement has been made of the surface drainage works and pavement of the entire city. There can be no doubt that when the two last mentioned works have been completed, the sanitary conditions of the port will undergo a notable improvement.

In Mérida the city is also divided into four districts, each one under the charge of a physician with 28 agents and 38 servants, whose duties are identically the same as those above described with respect to Vera Cruz. Mérida is a city which is distinguished for its cleanliness; the streets are paved with short asphalt, the houses are all clean; the inhabitants, even in the poorest class, have reached a degree of personal cleanliness that with difficulty could be found in any other city.

In Progreso the service is carried out by a physician and two agents, whose labors are for the same objects as those above referred to.

In order to attend to any chance cases of yellow fever which may present themselves in any of the towns that have formerly been invaded by this disease, we have organized three flying brigades.

One of these, has its headquarters in Cordoba, which forms the junction of the Mexican Railway (from Mexico to Vera Cruz) with the Vera Cruz and Pacific (from Cordoba to Sta. Lucrecia) and has jurisdiction on the one side as far as Sta. Lucrecia, on the other as far as Vera Cruz, and on the south as far as the Valle Nacional.

The base of operations of another brigade is in Coatzacoalcos. Its radius of action extends to Sta. Lucrecia, thus covering the two cantons of the state of Vera Cruz.

The third brigade has its headquarters in Salina Cruz, and operates as far as Sta. Lucrecia, where the Vera Cruz and Pacific Railroad connects with the Tehuantepec National.

The way these brigades work is as follows: The Supreme Board of Health receives the agents' reports on the sanitary conditions in the different camps, with the following data: Number of confirmed cases observed during the day; number of non-immunes who are suspected of suffering from yellow fever and isolated; number of confirmed or suspected cases observed since January 1st; number of houses visited to know whether there are any water tanks or reservoirs with larvæ; number of non-immunes visited during the day. As this report is sent in every day by wire, the board has immediate knowledge of any suspected case which may arise, and the chief of the respective flying brigade is at once sent there with a part of the staff under his orders, the necessary utensils to make the disinfection, and a sufficient quantity of oil to cover the open water reservoirs, or tanks. He proceeds to the isolation of the suspected patient, disinfects the house in which he has lived, as well as all others in the immediate neighborhood, and makes domiciliary visits in order to discover any other person who may be an object of suspicion.

As it is very possible and has actually happened, that persons suffering from yellow fever or under suspicion, travel by railroad, a sanitary agent boards every incoming train and takes note of all the passengers, with their names and destination. If any sick person is found who is capable of continuing his journey in a sitting posture, he is covered with a hat which carries a veil similar to the one I now present, and if he cannot sit up, he is covered with another veil, of which I also present a specimen, and on arrival at his destination, he is turned over to the head of the local sanitary office to be at once isolated. This service is carried on over all trains throughout the zone which at other times has been invaded by yellow fever.

If any place whatever included within any of the zones, a focus of yellow fever should be discovered, the flying brigade at once proceeds to the place and if any lazarette or hospital exists there, the patient is isolated therein, and if none exists, a provisional and portable hospital is erected, of which I present a model.

As the states in which yellow fever existed, not only contribute out of their resources to the maintenance of the service which I now describe, but have also surrendered their authority in such matters to the federal government, there is only one central authority, in the city of Mexico, and this is the one that by means of the telegraph, con-

trols the service of these brigades, and thus can give timely attention to any emergency which may arise.

We hope that if all the nations which inhabit the western hemisphere and whose territory contains localities that are susceptible to the appearance of yellow fever, will establish services similar to those now established in the Mexican Republic, this disease will in the near future entirely disappear from the face of the earth.

SANITARY RECORDS OF DWELLINGS.

Dr. MANUEL S. IGLESIAS, Vera Cruz, Mexico.

The sanitary service which was established in Vera Cruz for the purpose of carrying out the campaign against yellow fever, has not limited its labors to the stamping out of this disease, but has extended them with a view to the suppression of other transmissable diseases, and exercises a strict supervision over the public and private hygiene of the city.

By means of this sanitary service, we have been able to control and keep within bounds the enemy, yellow fever, till very lately considered an intangible and ineradicable impediment to the prosperity and welfare of the entire coast.

During the year 1903, in the last months of which the campaign against yellow fever was commenced, we observed 1075 cases and 376 deaths from that disease; in the year 1904, 73 cases and 12 deaths; in 1905, 54 cases and 23 deaths; in the year 1906, 17 cases and 12 deaths, whilst in the present year we have only observed one case and one death. This gradual and progressive decrease in the disease which has been observed from year to year, can be very truly attributed to the work executed by the above-mentioned service, and not to any outside cause, as in such case, the disappearance of the disease in the years mentioned, instead of being slow and gradual, would have been sudden, and the endemia during that period would have been intermittent; whilst after the heavy epidemic of 1903, during the following year we would have observed one or two, or perhaps no case at all, with an exacerbated epidemic in subsequent years, just as we have seen in previous periods, and as is shown by the history of the disease whenever the present methods for its suppression were not employed.

I have intentionally stated that the disease has been brought under control and within bounds, and have been careful not to say that it has been finally stamped out, and for two reasons: Firstly, because during the last few years there have not been wanting a few cases which have been originated in Vera Cruz or imported from some other place, of which we have received timely notice, and therefore have been at once able to isolate and proceed to the disinfection of the premises occupied by the patient.

Pessimistic and incredulous persons who have eyes and do not

see, laugh at our triumphs and deprecate the importance which is given to the benfits realized by this campaign. They refuse to give the co-operation which they ought to the realization of the success we have had with yellow fever as against tuberculosis and malaria, now that fortunately for Vera Cruz, the other transmissable diseases are unknown, or at the utmost only found in an isolated case now and then and at long intervals

Notwithstanding the difference observed with regard to our labours, and the very slight assistance given to us, we will still persevere and are now accumulating resources for the struggle whenever it comes, so that when the people in general decide to give us the assistance which we so much require, we will be entirely prepared to attain our purposes. With this end in view, we are going on improving our service of information, and to this end, we have a sanitary sheet or report, which we file with respect to every house within our jurisdiction so that in the course of time, we get up a full collection of records which are filed by districts, streets and numbers.

As you can see from appendix, we enter the following notes on that report sheet

I Each and every dwelling or apartment in the house, showing the number of inhabitants in each, and the head of the family, so as to identify in case of need.

II The sanitary appliances contained therein under their two principal headings, that of water and that of drainage, and all the special details of each one are duly noted in the respective column.

III The transmissable diseases which are observed, noting in the columns not only the names of the diseases, but also their details, such as the date of the observation, the name of the patient, the result of the disease and the apartment of the house in which the case was observed

IV The disinfections made on account of the diseases noted.

V The work ordered by the sanitary authorities, either in the building itself or in connection with it, for the purpose of improving the hygienic conditions

The sanitary agents who are commissioned to make the house to house visits are those who, under the direction of a physician who is at the head of the service, have carried out the detailed inspection of each house for the purpose of forming the sanitary records, and in order that this work should give the desired result, be continuous as well as complete and perfect, these sanitary agents are under lets to present a written daily report of anything new which they observe within the territory under their charge, as shown in

Appendix II, giving the arrivals and departures of persons within their respective territory, the disinfections made, with reasons for the same, the sick who have been found in the course of the day, the notices served on the proprietors or managers of the buildings, to execute any particular work which may be required to correct the sanitary defects which may have been found, as well as all other matters which come under their notice, such as the defects in the water service and sewerage, the conditions of cleanliness in the yards and other dependencies of the building, the water tanks or reservoirs which contain larvæ, etc.

These methods have many advantages, which I now proceed to state:

Both the physician who is at the head of that service, as well as the sanitary agents under his orders, acquire a perfect knowledge of the sanitary jurisdiction which is under their charge. Within a a very close approximation, the number of persons residing in each one of these districts, can be known at any given moment. Daily reports are presented of all sick persons, and even in the majority of cases, of the disease from which they suffer, as the agent can obtain direct information from the attending physician or from the patient's family, and the diagnosis is rectified or confirmed by the chief of the service. The sanitary agents also see to the working of the sanitary appliances, and as soon as any defect is observed in them, the manager or proprietor of the building is ordered to make the necessary correction. The sanitary record of the building and of its dependencies, are of service in investigating the cause of the appearance of any disease there, as well as the security it affords to the persons dwelling therein from a sanitary point of view, as all the disinfections made in that building, as well as the cases of disease which have appeared there, and other data, are all entered on the respective sheets.

With this system of reporting, and with a personal inspection, the physician who is in charge of the service keeps himself in daily touch with the sanitary conditions, and can take all the measures required, and I therefore believe that just as we have been able to control the yellow fever situation, the day is not far distant when we can do the same with other diseases, as we have a certain base from which to start in our future operations, an exact knowledge of our sanitary district.

APPENDIX I.

SANITARY REPORT SHEET

.... District ..... Section.
..... of .....Number.....

Dwellings or Single rooms	Number of inhabitants	Isolated rooms	Number of inhabitants

Water service. Sewerage.

APPENDIX II

SANITARY REPORT for the day of 190

The (1) Number or letter of the (2) of the court in which lived has been vacated

The (1) Number or letter of the (2) of court which was empty, has been occupied by the following persons . . . years of age, from , with years residence.

A disinfection was made in the (3) on account of (4)

Sick persons found during the visit

Notices served on managers of building

Developments met with in the visits

(1) Isolated room in the street or in a court
(2) Street or avenue
(3) Isolated room on the street or in a court pertaining to the house or street in which the disinfection has been made
(4) Disease which gave rise to the necessity for disinfection

Only new developments are noted, with clear specification of their details and no mention is made of anything that is not seen. For example, if no house has remained empty and no empty one has been occupied, but some house has been disinfected, such disinfection will be the only thing reported without taking any notice of the other blank spaces. If no house has been found disoccupied, but an empty one has been occupied, and there is nothing else new, the report will confine itself to those new occupants, and so on reporting everything that has been observed that could affect the hygiene of that particular house, and if there is nothing to report, writing that fact across the blank form

MEASURES RELATIVE TO IMMIGRATION ADOPTED IN MEXICO.

DR. EDUARDO LICEAGA, MEXICO CITY, MEXICO.

The facilities for communication between men, whether by land or by sea, have brought with them enormous benefits to humanity, but as there is no benefit which is not associated with its corresponding disadvantage, so the facilities for transportation which are furnished by steamships and railroads cannot be called an unmixed good.

In going from place to place, men carry with them the diseases from which they suffer. The international sanitary police has zealously endeavored, at times even with exaggeration, to prevent transmissible acute diseases from being carried to the ports or frontier cities, or more exactly speaking, to prevent the transmission of those diseases by detaining those who suffer from them, or are suspected of suffering on board of the vessels by which they have been carried, or in special lazarettes. But the same precautions have not been adopted up to the present date by our legislatures against the chronic diseases which are transmissible, and nevertheless, it is just as necessary to protect ourselves from the acute transmissible diseases, as against those whose development is slow and which are therefore denominated chronic.

In these days, in which the Asiatic immigration encounters such great difficulties in penetrating the United States of America, it has turned its face towards the countries of Latin America. In Mexico, we receive every month, in the port of Salina Cruz, one or two steamers with Chinese immigrants, and another with Japanese immigrants.

Our sanitary code provides that only those persons will be allowed to enter the Republic, in the capacity of immigrants, when they bring with them certificates, issued by the competent authority of the port of departure, and viséed by the Mexican consul, proving that they are in a perfect state of health. Under that code, the certificates issued two months previously to the date on which the immigrant reaches our country, will be of no value.

But this provision was in itself insufficient, because the immigrants might have started already infected with disease, but in a state of incubation, and thus reach our ports with the evil already developed. It is to be noted that our situation lends itself greatly to the transmission of disease, because the steamers have no port of call, but

come directly from the Asiatic coasts to our Pacific ports. In view of this, rules have been issued with respect to Asiatic immigrants, which can be briefly stated as follows:

The immigrants must come provided with a certificate of health issued by a physician in the place they start from, and visèed by the Mexican consul in that same place, or if there is none, by the United States consul.

Asiatic immigrants can only be landed in the port of Salina Cruz if their number exceeds ten, but when they do not reach that number, they are allowed to land in the ports of Acapulco, Mazatlán, Guaymas, Tampico, Vera Cruz or Coatzacoalcos.

Every vessel which carries immigrants is received in accordance with the provisions of the sanitary code, of the maritime sanitary regulation and of the special rules which the Supreme Board of Health may issue in each case, in view of the circumstances.

Should there be no special circumstances, the healthy immigrants are at once landed and taken over a special wharf directly to the barracks reserved for them.

In these barracks they are made to take baths; their clothing and baggage are disinfected and they are kept under observation for *ten days*.

If within that period of time, no disease has appeared amongst them, they are permitted to leave and the delegate notifies the Supreme Board of Health of the destination of each one of those immigrants.

Up to the present, these measures have been sufficient to keep us free from cholera, bubonic plague and yellow fever; but they have not prevented the introduction into the country, as has actually happened, of persons suffering from beri-beri. As this disease was entirely unknown in Mexico, and as, on the other hand, the persons who suffered from it were in the first stages when it is difficult to recognize it by those means that render it visible in a more advanced stage, several cases were observed in Salina Cruz, Tehuantepec and Sta. Lucrecia, but only amongst the immigrants themselves. As soon as the sanitary authorities discovered those cases, they obliged the patients to return to their own country, and ordered that no person suffering from beri beri should be allowed to land.

Trachoma was a disease only known in Mexico to oculists, and it must have been so rare, that its knowledge had not yet reached the generality of the medical public, and still less that of the laity. A distinguished ophthalmologist of Mexico, Dr. Lorenzo Chavez, had occasion to observe a slight epidemic of trachoma during last year in one of the government schools, and called attention to the

danger of its possible propagation. This fact led the sanitary outhorities to give some attent.on to the possibility of trachoma being brought into the country by Asiatic immigrants, and to the danger of that disease spreading through the country, for which reason the delegates in the different ports were warned and they have commenced to take note of the number of persons suffering from trachoma who reach the Republic, and naturally find a greater number amongst those who come to our Pacific coast ports, than in the Gulf ports. In one steamer, 220 persons were found suffering from this disease.

The Supreme Board of Health then requested the Secretary of the Interior to prohibit the landing of these immigrants, with the result that they were returned to China, and an official declaration was obtained that sufferers from trachoma would not be allowed to land in any of the ports, either on the Gulf or on the Pacific.

In order to prevent the introduction of the disease above mentioned, a careful inspection is made of the immigrants before they embark in the port of Hong-Kong, from whence the Chinese immigrants come. For this purpose a medical delegate of the Supreme Board of Health has been sent to that port, and he prevents the embarkation of the immigrants who may suffer from bubonic plague, cholera, and other transmissible diseases as well as from chronic diseases such as tuberculosis, scrofula, malaria (with present accesses), beri-beri, trachoma, cutaneous disease and other chronic transmissible diseases. In the same manner he prohibits the embarkation of the insane, aged, cretinous children, persons whose constitutions have been much debilitated by any previous disease or by organic defects, cripples, hunchbacks or those who may in any way be rendered unable to work as well as all who may become a public charge in the country.

Before closing this report on the measures which have been adopted relative to immigration in the Mexican Republic, I would like to hear a discussion on the precautions which should be taken in this country and throughout the American continent to prevent the transmission of tuberculosis by the passengers who suffer from it, to healthy people during the inevitable and intimate contact of the sufferers with healthy persons who travel in the ships or in the railway cars, and more especially in the Pullman cars, as the sanitary authorities of Mexico are earnestly desirous of fully carrying out all the resolutions on this point which may be adopted by the American Public Health Association.

SOCIAL ETHICS AS INFLUENCED BY IMMIGRATION.

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I have taken occasion within the last three years to read papers on some phase of the immigration problem, such as "Immigration in Relation to Public Health," "Some Phases of Canadian Immigration," "International Co-operation in Inspection of Emigrants and Immigrants," "Civic Responsibility Resulting from Increase of Population through Immigration," and last year before this Association I read a paper on "Organized Sanitary Work in Dealing with Overcrowding and Pauperism due to Immigration." But remembering that there came to the United States in 1906-7 1,002,500 immigrants, and into Canada 252,000 during the same period, it is plain that so long as the individual is the unit of which society is but a multiple, just to this extent will the scientific study of society begin with the study of the individual cell or unit. "Omne vivum, ex vivo" was the battle cry of Pasteur and his school, thirty years ago, and it must be the starting place for all our studies to-day, no matter in what branch of biological science.

The immensity of the influences, which have been at work on what we may call, for the sake of a starting point, the homogeneous population of the United States existing at the termination of the Civil War in 1865 may be judged from the following tables showing the enormous increase in immigration:

TABLE SHOWING THE IMMIGRATION TO THE UNITED STATES IN SUCCESSIVE QUINQUENNIA SINCE 1820

Year	Immigration	
1820 to 1860 inclusive		6,076,297
1861 to 1865 inclusive	719,439	
1866 to 1870 inclusive	1,657,841	
1871 to 1875 inclusive	1,756,786	
1876 to 1880 inclusive	1,085,385	
1881 to 1885 inclusive	2,975,891	
1886 to 1890 inclusive	2,270,639	
1891 to 1895 inclusive	2,125,859	
1896 to 1900 inclusive	1,565,985	
1901 to 1905 inclusive	3,833,076	
1906	1,100,738	
		19,087,156
Total		25,163,453

TABLE SHOWING THE TOTAL IMMIGRATION TO CANADA SINCE 1820.

Year.	Immigration
1820 to 1860	910,200
1860 to 1865	76,244
1866 to 1870	120,706
1871 to 1875	144,902
1876 to 1880	78,413
1881 to 1885	180,412
1886 to 1890	142,412
1891 to 1895	103,645
1896	15,267
1897	20,016
1898	30,742
1899	44,543
1900	44,697
1901	49,149
1902	67,379
1903	128,364
1904	130,331
1905	146,266
1906	189,064
1907 to July	252,038
Total	2,874,790

A mere glance at the two tables serves to show how different was the history of the two countries as regards immigration between 1860 and 1900. Thus while there were 12,198,907 immigrants admitted to the United States between 1861 and 1900, there were but 1,012,199 added to the Canadian population. However, there has been no lack of immigrants since then, for including 1900 there have been 1,007,134 immigrants admitted to Canada as settlers, of whom 252,038 entered between July 1st, 1906, and June 30th, 1907, or 1 for every 24 of the previous population came in last year, or at a rate per 1,000 of population notably greater than ever entered the United States. Hence it is apparent that Canada cannot escape any more than can the United States the effects of such enormous movements of population, nor can she any more than the people of the United States afford to ignore the influences or neglect the study of forces ever present and affecting for good or evil the natural life of these two English speaking and originally Anglo-Saxon communities.

It is hardly necessary to say that these two countries, whose populations together have increased on an average about four-fifths of a million per year during the past century, have seen not only enormous

material development but have also been the theatre where has been seen the free intermingling of millions of persons, diverse in language, in social customs, in religion, in educational advancement, in political knowledge and in financial standing, under democratic institutions and under conditions favoring admixture and absorption, due to compulsory education and to transportation facilities, to a degree never existing anywhere before in the world

What has been the outcome of the many streams of influence debouching into one common sea of humanity we have to-day clearly set before us and for a few moments it may be of interest and incidentally of profit to us, if we can from a standpoint of detachment, examine, necessarily it may be for some of us, either with spectacles, monocles, or field glasses, the movements of individuals, groups, classes, and communities sailing in barks from the cockle shell to the great ocean liner over the surface of this sea, influenced by storms seasonal, and paroxysmal, winds occasional and local or steady and permanent and currents which arise either from some local shore influence or some stream deep, strong, world-encircling and organic

With the facts and results of to-day before us it is almost impossible to comprehend the attitude of the inhabitants of the newly formed states of the Union of a century or so ago, when, as Prof Brooks states "In 1812, at the Hartford convention one of the ablest men thought we had enough inhabitants of our own" and Jefferson was pretty nearly hysterical in his fears of immigration From the high-water mark of 1832 onward, especially to 1857 approaching the year of the Civil War, the era of steadily increasing immigration continued, due to the building of railroads and opening up, of the illimitable western prairies from Ohio to the Missouri That this enormous influx should have accentuated fears, already strong, of the domination of foreign ideas and beliefs is seen in the rise of the "No-nothing" movement in the fifties, following the extraordinary exodus from Ireland especially during the famine years of '46 and '47 and the political ferments of the same period both in that country, Germany and other continental countries

We have seen what the population was in 1800, how immigration expanded after the war, and seemed to have reached its climax in the decade from 1880 to 1890, when it approximated 4,500,000 only to have been exceeded during the present decade which has seen 4,800,000 in six years arrive in the United States and 1,207,000 in Canada in the same period It may be well for our purpose to complete these figures by giving the nationalities of the immigrants entering the United States from 1850 to 1900

TABLE SHOWING THE NUMBER OF IMMIGRANTS ARRIVING IN THE UNITED STATES BY NATIONALITIES AND BY CENSUS YEARS.

Name of Country.	1850.	1860.	1870.	1880.	1890.	1900.
Austria	946	25,061	30,508	38,663	123,271	276,249
Bohemia	.....	.....	40,289	85,361	118,116	156,991
Canada (English)	147,711	249,970	493,464	717,157	678,442	785,958
Canada (French)	.....	.....	.....	.....	302,496	395,297
Denmark	1,838	9,962	30,607	64,196	132,543	154,284
England	278,675	433,494	555,046	664,160	909,092	842,078
France	54,069	109,870	116,402	106,971	113,174	104,341
Germany	583,774	1,276,075	1,690,533	1,966,742	2,784,894	2,666,990
Holland	9,848	28,281	46,802	58,090	81,828	105,049
Hungary	.....	.....	.....	11,526	62,435	145,802
Ireland	961,719	1,611,304	1,855,827	1,854,571	1,871,509	1,618,567
Italy	3,645	10,518	17,157	44,230	182,580	484,207
Mexico	13,317	27,466	42,435	68,399	77,853	103,410
Norway	12,678	43,995	114,246	181,729	322,665	336,985
Poland	.....	7,298	14,436	48,557	147,440	383,510
Russia	1,414	3,160	4,644	35,722	182,644	424,096
Scotland	70,550	108,518	140,835	170,136	242,281	233,977
Sweden	3,559	18,625	97,332	194,337	478,041	573,040
Switzerland	13,358	53,327	75,153	88,621	104,069	115,851
Wales	29,868	45,763	74,533	83,302	100,079	93,652
Others	57,633	76,010	123,743	197,473	234,155	356,280
Total	2,244,604	4,138,697	5,567,229	6,679,943	9,249,547	10,356,644

The table serves to illustrate several points. If we estimate the total immigrant population in the United States in 1860, we find it to have been 4,138,600 or 12.2% of the total 31,443,321 population, while if we examine the nationality of these immigrants we find that 3,851,851, or 93% of the total 4,138,600 belonged to the eight nationalities; Canadian, 249,070; English, 433,494; French, 109,870; German, 1,276,075; Irish, 1,611,304; Scotch, 108,518; Norwegian, 43,995 and Swedish, 18,625. If, again, we take the total immigrant population in 1900 we find it to be 10,356,644, or 13.5% of the total population of 76,303,387. Estimating the total immigrants from these same eight countries we find that they number 7,557,233 and constitute but 72% of the total alien population. We may add here the fact that in 1880 of a total population of 50,155,783, some 12,963,00 or 25.8%, were urban or lived in towns of 4,000 or over, while in 1900, of the total population of 76,303,387 some 24,411,698, or 37.3% were in towns of 4,000 or over. Further, that in 1900 of the 21,046,695 in the North Atlantic states, 13,613,736 were urban, that is, 64.7%, while in the

North Central states of 20,333,044 there were 6,774,930 urban, or 35.5%, but in the South Central states, such as Kentucky, Alabama, etc., of 14,080,947 only 13.5% were urban, and in the South Atlantic with a population of 10,443,400 but 19.6% were urban.

We thus have abundant material for our investigation extending over at least two generations of 25 years each, which have afforded ample time to produce such effects upon the original homogeneous population of 1800 as to be easily observed and measured. As was the early half of the Victorian age in political, social and literary progress and reform in Great Britain, so were the older thirteen states of the Union in their ideals. The teachers of the early part of the century had been the central figures in the struggle for political emancipation from the enervating bonds of a colonial policy which suppressed political progress as well as commercial and industrial advance, and stimulated by the renaissance in France and Germany, a group of writers and thinkers arose who gave a form and permanence to American literary, philosophical and social ideals on the same moral plane which marked the best thought whether in Great Britain or on the continent of Europe. But there were, even in the early years of the century when the lure of the boundless possibilities of an illimitable unknown West, South and North were ever as the voices of sirens, or the wiles of the priestess of Calypso's Isle, to the pioneers and wandering spirits who like Ulysses voyaged to many lands and over undiscovered seas, elements everywhere present cultivating a new spirit not alone of adventure, but of speculation and enterprise by which canals were dug, steamboats invented, railways everywhere exploited, all reaching a rate of progress and rapidity of development which had never before had its counterpart in the world's history. Thus it was that the year 1850 found the United States with a population of 31,448,321 with its old civilizations of Boston, New York and Philadelphia, and its older aristocratic traditions of Maryland, Virginia and the Carolinas, face to face with a raw, uncouth, semi-developed mass of humanity, pulsating with the fresh blood and youthful energy from European, but especially British, countries, where for half a century the "rights of man" as regards freedom and equality of opportunity had been fought for and had at last been obtained. Measured by the accomplishments since then of these ever increasing millions in any and every sphere, we may adapt the oft quoted reference to Sir Christopher Wren: "Si quaeris prove tam amoenam circumspice."

But if we pursue this reference and turn to Wren's crowning glory, we find even here that build well, as Wren could, now a century and

a half since the great designers are seriously engaged, not in rebuilding, but in examining the foundations of St. Paul's to search out defects, if there be any, in the mighty edifice, and to remedy such ere grave and irreparable injuries to the structure result.

Reference has already been made to the fact that in 1860 out of a population of 31,448,321 in the United States but 10.5% was urban and that this urban population had risen in 1880 to almost 13,000,000, or 25.8%, and in 1900 to 24,411,698, or 37.3%. In other words, where in 1860 there once was a simple rural people of 26,371,005, we find in 1900 a rural people of but 50,485,268, or less than double, contributing to the maintenance of some 30,000,000 city dwellers, or a population six times as great as in 1860. This remarkable development of urban life with all the physical and moral problems incident to such has been so fully dealt with by European as well as American writers that it is only necessary to refer to it in order to recall to the members of this Association what it means in a nation where probably 45% will at the next census be found to be city dwellers. But, remembering that in England the last census showed 80% of the population to be urban, we need only say that in the United States, as in Canada, the evils of urbanization are still presumably at least, less than in England, and therefore we may properly concern ourselves rather with the particular effects which the immigrant foreign population is having on the ethical status of our population. Examination of the United States census of 1900 shows that of the 10,400,085 foreign-born persons, 1,017,244, or just one-tenth, had been in the country less than five years, and of this total, 1,070,126 were non-naturalized. It is of further interest to note in two states having very large foreign populations, Massachusetts having 840,324, that there were 120,854, or about 14%, not naturalized, though 88,546 had been in the country over five years, while California with 120,854 had 25,187, or about 20% not naturalized, though 62,003 had been in the country over five years. The returns for cities of 100,000 and over show 72% of all male foreign born persons over 21 years to have been naturalized, and that of this number but 6.3% were illiterate. Of the total in the North Atlantic states but 50.0% were naturalized. Of the total non-naturalized foreigners in 1900 in the five great cities of the United States there were: —

In New York,	152,782	with 24.8% illiterate.
In Boston,	24,119	with 22.8% illiterate.
In Philadelphia,	37,731	with 25.5% illiterate.
In Chicago,	35,897	with 19.4% illiterate.
In San Francisco,	19,205	with 11.2% illiterate.

But other facts of interest appear in these returns. Thus

River, Mass., in a population of 104,863 there were 14,705 foreign born males of voting age, of whom 47.2% were not naturalized, and of whom 40.4% were illiterate, while in San Francisco in 342,782 of a population there were 60,014 foreign born, of whom 21,508 were non-naturalized, but of whom only 11.2% were illiterate. When we further note that while the illiterates in the total native born males of voting age in the white population of the United States were 5.8% of those in the same class, the illiterates in the children of foreign born white parents were but 2.0%, and that in both the South Atlantic and South Central divisions the illiterates amongst the colored population were more than 50%, many thoughts arise in our minds as to the meaning of these facts.

Adverting to the question of ability to speak English, it is found by the census that while, roughly speaking, the non-naturalized alien of voting age constitutes one-fifth of the total foreign born, there are very remarkable differences in the percentage in different areas. For instance, in the great agricultural areas of the North Central states containing one-third of the population of the country, only one-tenth of an aggregate of 2,070,811 foreign born of voting age is not naturalized and of this great number only 8.5% cannot speak English while 20.8% of 2[illegible],23 male adult aliens cannot speak English. In other areas, as Texas with 87,10[illegible], adult foreign born, of whom 30,534 are naturalized, 35[illegible] cannot speak English, while 69% of the non-naturalized cannot speak [illegible]. This latter fact serves to illustrate the point that in the degree that density of population and opportunity for admixture exists in any locality, will the newcomer acquire the language, customs and ideals of his surroundings, whereas in the degree that people are isolated in sparsely settled communities as the Mexicans in Texas with few facilities and but little need for mingling with others of diverse speech, occupations and customs will their adoption of other language and habits be slow. What further is most noticeable is that where foreigners have gone largely into centres like the North Central states, where others of the same nationality are present in large numbers and have become as the various branches of the Teutonic race prominent and important members of the community, the naturalization of the newcomers is rapid. Again, as borne out by the census returns in states bordering on the one case on Canada and in the other on Mexico, there are by far the largest number of non-naturalized aliens who have been over five years in the country. Thus in the states of Massachusetts, New Hampshire, Vermont and Maine there is one non-naturalized adult alien for every 25 naturalized, while there is one in Texas to every five foreign born

It will now be apparent that I have selected such statistics from the census as deal with large masses of people and refer principally to three distinct points: (*a*) the distribution of immigrants in various areas or states; (*b*) their occupation and residence, whether in city or rural, and (*c*) their tendency to become naturalized citizens and the relation of this to their illiteracy and tendency to learn English. I have selected such since it would seem possible to draw from them several broad conclusions. The first of these is that the nearer to the already resident population of a country, whether in language, religion, customs or occupations, any immigrant is, the more rapidly does he become a naturalized citizen. The second point is that immigrants of any nationality seek naturally those states, cities and localities where are already persons of similar nationality; and further, that as certain peoples through generations have developed aptitudes for certain occupations, trades and employments peculiar to their own climate and country, so will they necessarily follow such in a new country, if facilities for such exist. Hence urban residents emigrate to cities and largely remain in them, while agricultural people naturally tend towards the cheap or free grant lands of the newer states and territories. The third point is that the commercial, social and political environment of the immigrant in the city tends to his more rapid adoption of the language, habits, employments and ideals of his new place of residence. Hence we observe that it is in the larger urban centres that the assimilation of the immigrant to his environment is most rapid, while as has been shown statistically there may remain large rural settlements of people who for many years maintain their old customs, speak only their own language and scarcely can be said to comprehend or take a part in the political movements of their new country.

So far I have endeavored to indicate rather the actual facts as regards the forces which have been and are ever at work producing effects on the ethical status of the people of the United States and of Canada, than to attempt a qualitative analysis of the results of these forces. Much may be suggested, but in a study of a problem with so many factors, one does well to draw if he can only a few of the more obvious conclusions. Thus, for instance, that the open Sunday as compared with the old-time Sunday of half a century ago, has been largely due to the large number of immigrants from the continent of Europe. The growth of a literature often printed in a foreign language, which appeals or is intended to appeal to a type of readers measured rather by their numbers than the elevated quality of either their intellectual or moral appetite. The introduction and permission

of drama, whether as tragedy or comedy, in uptown theaters as well as on the Bowery, wherein are reproduced and tolerated scenes dealing with social irregularities and moral tragedies before audiences blasé, or seemingly often lacking in any discriminating sense of the low moral plane upon which their sympathies are appealed to. The existence, spread and kindly toleration of every "*ism*" in religion, since men are assembled from every country under the heavens, and bring with them their household gods and traditional divinities as truly as did the old-time Roman set up in his home in a newly conquered province his "lares et penates." That the basic reasons on which our customs and morals are founded are strongly affected by our environment has been indicated; and that new influences should become permanent and crystallized through legislation must naturally follow. How otherwise than by the apotheosis amongst the new-comers as well as in the natural-born on this continent of individual freedom to do as to each seems best can be explained such radical departures from the old-time ideas which prevailed in most European countries regarding the social and binding character of the marriage tie, as are seen in the divorce laws of many states both old states as well as those rapidly filled by cosmopolitan immigration and emigration. It will have been observed that no attempt or intention is made to criticize or express any opinion as to the moral quality of these changes, but only to indicate what seem to be the effects associated with immigration. As it is impossible to separate a man's daily occupation from his personality it is unnecessary to say that the spirit of adventure and enterprise which leads men to undergo the hardships incident to the opening up of new countries, not only demands a certain type of mind and of physical energy, but also developes in others a directness of vision and of the application of means to the desired end which has marked and marks today the pioneers who have opened up the American continent to commerce and civilization. No physical difficulties have daunted these men, while in the intellectual and moral sphere the great West has developed intellects not only illustrating physical force, but which even in literature, in social experiments and in legislative enactments have stopped at nothing and, whether in a right or wrong direction, have been the exponents of a virile activity which in the absence of the ever-regulating effects of precedent have taught even the older states and countries of the continent the full meaning of Sewell's lines —

> "No pent up Utica contracts your powers
> But a whole boundless continent is yours."

It is not necessary to illustrate by many examples the results. Probably nowhere else in the world to-day are there 85,000,000 people working as hard as those on the northern half of the North American continent. The United States alone not only supported a population of sixty-three, increasing to seventy-six millions between 1890 and 1900, but increased its products sold to other countries from $1,558,000,000 to $1,087,000,000, or by $429,000,000, while Canada has shown not only her productiveness but also the energy and activity of her people by increasing her population in round numbers from 5,000,000 to 6,000,000 between 1900 and 1906, and also extending her trade with foreign countries from $336,018,000 to $518,800,000, or by some one hundred and eighty-two million dollars. When we seek to understand the bearing of such facts upon the subject under discussion, we must necessarily remember that the 3,687,564 immigrants who entered the United States between 1890 and 1900 were, according to the ordinary value set upon a man's labor, as if $1,843,500,000 had been added to the capital of the nation. It is safe to say that it was in large measure their labor representing capital which has made the millionaire a multimillionaire, which has performed the rougher, cheaper work of railroad construction, increasing mileage from 166,703 to 194,262 in ten years, which has stimulated the development and growth of every kind of industry, such as the iron and many other similar industries, thus increasing the accumulation of wealth and comfort at home and abroad.

We have thus illustrated briefly the forces which have been at work, we have seen peoples multiply by millions in every decade, have measured their labors by their results, have illustrated the conditions under which fabulous individual accumulations of wealth have taken place through the facilities for the organization of capital made possible by modern inventions and through the exploiting of the natural resources of the country. We ask ourselves as we contemplate the situation, awestruck at the immensity of the problems which present themselves to the human mind — "What is the meaning of it all? Is some blind fate leading these enormous aggregations of men, energy and capital to the brink of some precipice, there to be hurled into chaos and darkness, or has it another meaning?" The populations of Europe and America and Asia have greatly increased during the past century, owing in large part to fewer wars, greater security of life and prosperity at home, with a notable improvement in sanitary conditions of living, by some 300,000,000 in fifty years, (according to Sir William Crooks) of the wheat-eating peoples of the world, while wages have notably increased and modern inventions have brought

to the door even of the poor comforts and conveniences unknown fifty years ago even to the wealthy. Labor has organized her forces, testing her strength in many a hard-fought battle with capital, and revelations made public by the courts have shown what human selfishness, unbridled, is capable of, whether it be corporate or individual.

But not elsewhere in the world could such events have taken place as have made the great body of the every-day public stand aghast, because never before has the world seen such an immeasurable mass of human energy released, moving ungoverned by law or precedent, no man knew whither. Europe has her millions in different countries but their increase yearly is announced. Here to-day in a single year a million and a quarter of people are found drifted from their anchorages in a dozen countries, a veritable human flotsam and jetsam. When they land on this continent, they come mostly to swell the army of labor, and according as they are received and dealt with by the 80,000,000 already here, will they be absorbed, assimilated, made American or Canadian or remain a foreign mass. Welcomed, they will assimilate and climb upward, as illustrated by Dr. Lyman Abbott in an address in 1902 in New York on the "Immigration Problem," who said:

"Undoubtedly (foreign) labor has come in and entered into competition with American labor and has crowded out American labor; but what has been the result? Has it raised or has it lowered American labor? I can remember when most of the working women in the factories of Massachusetts were American, not French Canadian and others as at present. The Americans were crowded out; but in what direction were they crowded, up or down? — that means a difference. Are the American girls now loafing around unkempt and ragged in the streets of Boston? No, they are typewriters, clerks and school teachers — they have been pushed up. . . . Upon the whole, the tendency in bringing these people to our shores upon the people of this country has been for their intellectual and moral development."

If held in contempt and if neglected and degraded, they but add to the oppressive ranks of a proletariat which is like a volcano in mid-ocean, quiescent while inactive. But if waked into motion, raising new islands or sinking existing ones, but in every case creating great tidal waves . . . human conflicts and many thousands on far distant shores.

. . . the standpoint of politics and social movements in their . . . we have . . . people to follow closely the events of a single . . . and to . . . how intense and how revolutionary many of these . . . effects . . . foreign relations, federal and state relations

and state and civic relations. The president and the premier are brought face to face with δεμος in a hundred ways. Now the impulse is against all immigration, again against skilled labor, and the latest is against yellow competition. Yet again it is popular indignation against insurance frauds, land frauds, railway rates, unlimited municipal franchises, and later a feeling of resentment that organized labor should fall foul of capital and be at times seemingly blind to the elementary principles which bind together labor and capital and which are forcing governments to organize boards of conciliation and compulsory arbitration. And the marvel of it all is that we behold these 85,000,000 gathered together on this Northern continent, day by day living side by side and yet at peace, though at times seemingly in social and industrial warfare. As John Graham Brooks said in his presidential address last year to the American Social Science Association: "How much earlier I do not know, but since 1787 we have had an unvarying succession of forebodings as to the coming evils of our immigration. Almost never do they seem really to have come, as feared, but they are always lurking there in the future. I asked several genuine restrictionists among the delegates at the recent immigration conference in this city. They agreed that they could point to no observable evil that had arrived, but it certainly would arrive if we did not put up the bars. It was admitted that enormous undertakings were everywhere waiting for more labor and were dependent upon it. But think of a million coming in a single year! Here is the ghost that for a century and a quarter has worked on our imagination."

I have been a student of the immigration statistics of the United States and Canada for the past five years, and as I follow the American tables of criminality, pauperism and insanity and compare them with those of the recent immigrant, I am forced as have been Brooks, Abbott, Bijur and Watchorn to admit that I do not find in them what I had expected and what indeed many of us want to find in them. I find that the races nearest or most recently from the soil, as the English, Scotch and Irish were fifty or seventy-five years ago, are to-day the people we ought to fear least, indeed are those we want most. For instance, during the past three years we have sent back from Canada as undesirables, after admission 1 in every 496 English; 1 in every 569 English-Hebrew; 1 in every 955 Irish; 1 in every 1,66 Scotch; 1 in every 6,021 Russian-Hebrew and 1 in every 16,546 Italian; while on the other hand we sent back 1 in every 525 Swedish; 1 in every 1,964 Dutch; 1 in every 1,423 Galican and 1 in every 6,338 German. This means that under compulsory clauses of the Immigration Act we get rid

of all undesirables appearing as such within two years after admission, and that of sixteen thousand Italians not one was deported as being insane, none as paupers and but one criminal. On the other hand it is amongst people who have become urbanized in industrial England that we find the greatest number of imbeciles, paupers and moral derelicts, although they speak our own language and come from a country whose moral, intellectual and social ideas are one with our own. When we come to the delicate subject of the cause underlying the notable loss in fertility in the older sections of the United States and Canada judged by the slow increase of population in sections of the United States and Canada, we have with regret to accept the situation and recognize that only through the steady influx of peoples who are agriculturists and laborers will the development of areas still waste go on and the growth of a vigorous population be maintained. Fifty years ago it was a common thing to see amongst British immigrants women working alongside the men in the fields as it is to-day amongst the German and Slavic immigrants, and as yet we have no other panacea for the ills due to the degenerative influences of urban life. De-urbanization of residence without increase of the agricultural population seems with the increase of transportation facilities the direction in which we are to look for an amelioration of these tendencies, but it is not in one generation that the vital resistance of the human organism to the cumulative effects of modern life processes shall be brought about. Meanwhile we see or think we can see that with the almost complete alteration in the habits and relations of mankind, dependent especially upon the discoveries of the last century, by which time and distance have been almost annihilated, events move rapidly toward the end of making all nations of the world as one; making the dividing seas to disappear and the mountain ranges to become meeting grounds for curing the ills common to mankind rather than ramparts of defence against enemies. We shall learn to recognize intellect and moral character, industry and altruism, rather than color or language as the standards by which the quality of men and their desirability as fellow citizens are to be measured.

Amidst all these changes, almost kaleidoscopic in their swiftness, we surely shall more clearly than ever see that God is in His universe; we shall understand that should the cycle of the life of the human individual not seem ever completed than in the past its usefulness being over, he will pass on from this sphere of action not to a Nirvana but to serve at higher realm of usefulness. Hence it must not be said or concluded that the increasing numbers of men in the

globe are likely to multiply our human ills, but rather that ever with the never-ceasing, ever-hastening march of mind, we shall behold man —

"Move upward, working out the beast
And let the ape and tiger die,"

until at length the scroll unrolled will find recorded that Tennyson's words are prophetic of the truth: —

"One God, one law, one element
And one far-off divine event
To which the whole creation moves."

IMMIGRATION IN RELATION TO PUBLIC HEALTH.

Dr. JUAN BRENA, Zacatecas, Mexico

The wise regulations which, in this country control the admittance of immigrants has freed the American people from innumerable misfortunes.

The refusal of a passage at the place of starting to every one unable to show a certificate of good health, the obligation on the part of the carrying company to provide the passengers with light, sufficient ventilation and plenty of room, water and good food during the passage, a fresh and minute medical examination of each person at the end of the voyage, a fine of one hundred dollars on the company for every immigrant who may prove to be unacceptable on account of advanced age, ill health or transmissible mental or bodily affection, free and obligatory repatriation of such invalids in the boat in which they arrived, a final observation of the immigrants reported as healthy, for which purpose they are obliged to declare their place of abode, and, finally, power on the part of the authorities to have sent back to their country within a reasonable time those who may prove to be incapable of work, all this constitutes a series of precautions eminently conducive to the preservation of the public health. But, as there is no human power strong enough to overcome the love of gain or to resist the desperate struggles of those who find themselves vanquished in the struggle for life, experience has shown that means have been found to elude, one by one, the restrictive orders by attempting and, at times, effecting the immigration of persons whose presence forms a focus of contamination or heavy burden for the towns where they may be received.

The soil of this great Republic being coveted as was the Holy Land in biblical times, it is not to be wondered at that the inundation of a million of immigrants who arrive year by year on an average, which number represents approximately the half of the total of those who in the same course of time leave all other parts of the world in search of a new country, should bring much social scum. The nations which have harbored them allow and even indirectly favor the exodus of their harmful elements.

On those conditions and when the laws of the country place no hindrances to emigration, this is comparatively easy. Even in nations in which the concession of a passport is costly and tedious and difficult

to obtain, as in Russia, there are not wanting those who cross the frontier by stealth, braving the greatest dangers. It may well be understood that such emigrants are adventurers of the worst kind, degraded morally and physically, vagrants, vicious, escaped criminals and deserters from the army. It would seem, at first sight, that the mere prospect of a fine of a hundred dollars for every infraction would be sufficient to deter the immigration companies from disobeying the law and allowing on board or attempting to land useless or harmful immigrants, but the contrary happens. The department of commerce and labor of the United States in the two months prior to the 14th of August of last year imposed on several companies pecuniary fines for the infraction in question, the amount of which reached eight thousand one hundred dollars, and, still later, in a single day, the twenty-second of the same month of August, the fines for the same cause produced one thousand two hundred dollars. The foreigners rejected who were the cause of such fines were, for the most part, cases of trachoma. As factors giving rise to these irregularities, we must bear in mind not only the interest of the companies in eluding the legal regulations, but, also, the complacency of the doctors and even their indifference in the fulfillment of their duties.

This has been very clearly shown to be the case by the chamber of commerce of Toronto in a protest which it presented to the Canadian government at the beginning of the present year against the admittance of immigrants suffering from tuberculosis. During last year, both in the free hospital for consumptives at Muskoka and in the like establishment at Weston, Ontario, consumptive aliens have been treated. The former of these establishments received two hundred and forty-three phthisical patients of whom eighty-three, or thirty-four per cent, were not of Canadian nationality, and it was proved that they had emigrated from their respective countries already affected with the disease.

These facts have originated the protest of the merchants of Toronto against the admittance of people suffering from contagious diseases. There is another circumstance which, at times, has helped to render illusory the orders of the sanitary authorities. I refer to the cunning with which the immigrants avail themselves of the inexperience of the medical inspectors.

Persons suffering from trachoma have been able, by the use of solutions of cocaine or adrenaline, to mislead the diagnosis of the expert inspectors.

It is known that the application of these substances makes the

[illegible] characteristic of the complaint disappear for half an hour.

Only a comparatively few [illegible] that whitish appearance of the conjunctiva awakened the suspicion of the doctors and, especially, when the immigrants were asked to open wide their eyes, before being examined, a liquid [illegible] which was found by chemical analysis, was the [illegible]. This was fully confirmed by a second examination [illegible] had been accepted as sound, [illegible]. Whether or not those who have been [illegible] require further vigilance. Up to a short [illegible] to report it.

[illegible] that in the year 1905 a German immigrant [illegible] the United States four years previously [illegible] tried to be allowed to [illegible]. He was sent to Ellis Island looking for [illegible] had served on the steerage of the same boat [illegible] to deviate from a hygienic point [illegible] has had recourse as best [illegible] the health of passengers. Various [illegible] passengers on the large trans-Atlantic [illegible], have been pointed out and condemned [illegible], by the immigration office of New York [illegible] which travelers have suffered are often on account [illegible] without separation of sexes, want of [illegible] these offenses [illegible] that he had never taken thought of nor [illegible] passengers. In another boat [illegible] did not cause [illegible] immigrants. At the [illegible] which run from Russia to [illegible] nor sufficient room [illegible] was in such a deplor-[illegible] the description [illegible] a medical publication [illegible] as regards the public [illegible] and therefore the disad-[illegible] require of a remedy can

be found in the addition of new precautionary measures to those already in force. I stated at the beginning that American legislation is very wise in this matter and we all acknowledge that it is universally regarded as a model of precision of its kind. It is, in fact, impossible to discover in it any want of precaution susceptible of improvement and it only remains to be desired that its exact fulfillment should be guaranteed.

The landing of undesirable immigrants can be completely prevented if the co-operative system which has been established between the United States and Canada be adopted everywhere.

The essential feature of that system is that both at American and Canadian ports, the inspection of immigrants and those crossing from one country to the other is conducted conjointly by inspectors of both nationalities associated expressly for the purpose. This cordial understanding has given the best results and the functionaries referred to fulfill their mission "without any friction," to use the graphic expression of Dr. Bryce in his learned discourse on immigration before the British Medical Association. Frequent visits of inspection to vessels and severe punishment to the inhuman speculators who renew in our times the cruelties of the old negro ships, will at last succeed in stamping out such horrors and improve the health of immigrants in their passage. The abuse of agglomerating an unlimited number of persons in a space out of all proportion to it will disappear if attention be paid to the wise suggestion of a distinguished hygienist who advises that there be fixed for every ship, in proportion to its tonnage, the maximum number of passengers which it can accommodate and which may not be exceeded on any pretext whatsoever.

It is of the greatest importance that the final examination of the immigrants at a port be conducted by experienced medical men of inflexible severity in questions of morality and of honor, and, in certain localities, by men who also combine special qualifications of competence. In certain Italian ports, for example, where cases of trachoma are common, inspectors are chosen from men who are conversant with ophthalmology and the aspirants to such posts attend lectures on the subject for some months previously. The term of three years which, in some countries, has been fixed by the authorities for the decree of expulsion of harmful immigrants, has been found to be a good addition to the regulations against the evils which may be caused by immigration.

In this matter the legislation of Mexico is very liberal in the faculties which it gives to the government. The supreme law of the country authorizes the President of the Republic to at any time and at his

discretion, have expelled from its territory a "pernicious alien." I am not aware that so far this penalty has been inflicted from motives of prophylactic hygiene, but it is beyond question that if the alien who disturbs the peace or commits offenses against morality merits the qualification of pernicious, he is not less so who can hurt one of the interests dearest to the nation — namely the public health.

TRACHOMA AND IMMIGRATION.

Dr. AUGUSTIN CHACON, Mexico City, Mexico.

It has been a motive of constant preoccupation for Europeans, the disease of the eyes called trachoma, and certainly there is a reason for that. In some countries, as Poland or Russia, trachoma is the cause of almost fifty per cent of all blindness, and forms thirty to ninety per cent of all the diseases presenting for treatment, as noted by Swan M. Burnett in the "System of Diseases of the Eye," by Norris and Oliver.

Trachoma is a chronic disease, difficult and sometimes impossible to cure, transmissive and responsible for many cases of blindness, partial or total. This disease is so serious, that a congress for the struggle against trachoma was held in Palermo in April, 1906.

It occurs with unequal frequency in different nations. In Europe it is common, in Russia, Greece, Bulgaria, Italy, Spain, Portugal, Belgium, Holland and Hungary. It is frequent in China and Japan, and this is of particular interest to the United States and Mexico, on account of the great number of immigrants who come from those countries. In Japan as Myjashita says, it was known more than twelve hundred years ago.

In Mexico trachoma has been considered until recently, by all oculists, as very rare. It has almost always been found in foreigners, who carried it from their country, particularly the Spaniards. Very few Mexicans suffer from it.

Members of the American Public Health Association who assisted in December of last year at the meeting held in the city of Mexico, heard a paper from Dr. Chavez. This oculist asserted that the number of cases of trachoma observed by him before July of last year was scarce, and since then he found a certain increase, and in a public school (School of Orphans), a mild epidemic broke out. Dr. Chavez thought that the spread of the disease was due to the Syrian immigration.

What Dr. Chavez asserted was considered and discussed, not only in the American Public Health Association, but also in the Academy of Medicine and in the Mexican Ophthalmological Society. However, some other oculists of the city of Mexico did not notice a sensible increase in the number of patients of trachoma in their practice. Before continuing this subject, I wish to say a few words about something that has an intimate relation with it, namely, the influence of race and altitude in the development of trachoma.

that of exotic plants. During the Spaniards' conquest of Mexico, many European fruit trees were carried into that country. Some of these found a climate and a ground favorable to their development and propagation, and on this account we have a certain number of fruits of European source, such as pears, apples, apricots, peaches, walnuts, etc., but those plants which did not find a propitious medium to develop, do not exist there, such arrives for instance, with the cherry, the plum trees and the raspberry bramble. From these plants, it is only by careful cultivation that it has been possible to obtain some samples that produce scarce fruits. I think the same thing happens with trachoma. Since the conquest, many Spaniards with trachoma have emigrated to Mexico, also many foreigners carrying the disease, but it is rarely transmitted to the sound.

We must be, notwithstanding, on guard, and though the reasons I have exposed do seem to me well founded, I comprehend that to sustain them, there are necessary, a longer experience and more observation. It could happen perhaps that the germ imported had a great virulence and that the disease would be propagated as soon as it arrived. It would not be wise to plan so dangerous an experiment.

The number of immigrants is every day greater, and since the Isthmus of Tehuantepec Railroad was opened to international travel, many Asiatic men, Chinese and Japanese arrive in the Mexican Republic, some of them sufferers from trachoma.

We have besides another powerful reason to prohibit the immigration of those affected with trachoma. It is that although the propagation of the disease is difficult in the central plateau, it could perhaps spread easily in some other lower towns, at the coast, though hitherto it has not happened. At least I have never had notice of it.

Every month arrive at Salina Cruz three or four steamers with immigrants, Chinese or Japanese aboard, and among them, twenty to thirty have trachoma. On the 6th of May of this year, the steamer Woolwich anchored, carrying 546 Chinese immigrants, several suffering from trachoma. The Superior Board of Health of Mexico asked the secretary of the Department of the Interior to forbid the landing of immigrants who arrived on the Woolwich suffering from trachoma or any other contagious disease. In July of the same year the Department of the Interior authorized the Superior Board of Health to prohibit the entrance to any Mexican port of patients with trachoma, and this order was transmitted to the delegates in the ports of the gulf and in those of the Pacific Ocean.

The Mexican government has moreover sent a physician to Hong Kong, with the charge of inspecting the emigrants for Mexico.

From what I have mentioned may be understood the pre-occupation of the Mexican government for the danger that trachoma will be imported to the Republic and there spread. Every hygienic measure has been taken to prevent it, and we trust that thanks to these precautions and all that will be ordained when needed, the danger that trachoma will become endemic or epidemic in Mexico is small, and that the country will continue to enjoy the privilege of considering it as an exotic and rare disease.

OPHTHALMIA NEONATORUM: A PROBLEM IN PUBLIC HEALTH.

F. PARK LEWIS, M. D., BUFFALO, NEW YORK.

It is not flattering to us as physicians and still less as sanitarians that an almost absolutely controllable infection is productive of more blindness than any other local cause. This is a fact concerning which volumes have been written and it has become evident that further work on the part of the medical profession must be purely academic. If this fruitful cause of poverty and misery is to be overcome the co-operation and advice must be secured of those active in public affairs. It is a social problem and its solution must rest with the sanitarians. When it is shown then that there exists a condition that produces from 7% to 10% of the existing blindness; that more than one-quarter of the children in the asylums and schools for the blind to-day have lost their eyes needlessly because of an infection that might have been prevented — when it is understood that the extent and importance of this form of inflammation of the eyes of new born children is so great that organized effort is being made to control it, there will be no doubt that it is a vital problem concerning the public health.

The American Medical Association has appointed a committee of which one member is also a distinguished member and former president of this Association — with instructions "to formulate and make effective the details of a plan that may give uniform legislation and definite instruction to the profession and laity concerning the prevention and treatment of ophthalmia neonatorum. The American Ophthalmological Society, the American Association of Obstetricians and Gynecologists — the American Obstetrical Society — the American Academy of Ophthalmology and Oto-Laryngology, have all appointed committees for the purpose of uniting in an effort to control what is now recognized as a world plague: it will be therefore at once evident that the subject is one of far-reaching importance and one that to be effectively dealt with demands wise, aggressive and concurrent effort on the part of all of those who are in a position to be of assistance.

Let us first clearly understand just what ophthalmia neonatorum is.

Gonorrhœa is so common in large centers that a trustworthy authority has said that nine men in ten in the city of New York have

[illegible] in their lives been afflicted with this form of urethritis. [illegible] of women infected is so great that our abdominal surge[illegible] are kept busy removing pus tubes that have developed from [illegible] When a woman is once infected there is no assurance at [illegible] after that the vagina may not contain gonococci. Other [illegible] may produce ophthalmia neonatorum but in more than [illegible] of the cases the gonococcus is found. These gonococci [illegible] the sources of re-infection wherever they find mucous tissues. [illegible] passage of a child through an infected medium while its [illegible] body is covered with pathogenic germs. If before [illegible] are opened just after the head is born, the lids are carefully [illegible] bits of absorbent cotton moistened in sterile water, and then [illegible] care is taken that none of the bath water, "gutter [illegible] water" as Stephenson calls it, enters the eyes, ophthal[illegible] reduced, as Stephenson says, almost to the vanishing p[illegible] two drops of a solution of nitrate [illegible] strength dropped on the cornea of each eye of [illegible] the vitality of the [illegible] and have found entrance [illegible] themselves are not [illegible] may result in [illegible] not being [illegible] countries [illegible] is common [illegible] have been obtained [illegible] are received between [illegible] entering are [illegible] during the past four [illegible] been their affliction [illegible] examined [illegible] ophthalmia [illegible] the whole [illegible] lives [illegible] is a sacri-[illegible]

[illegible] enters [illegible] per cent, [illegible] the main causes of blindness [illegible] a period of sixteen years. In this table [illegible] were [illegible] Dr. George [illegible] Harlan and I [illegible] in the compilation of the averages.

Recently Mr. Simeon Snell in a communication to the British Medical Association reported that of 333 inmates of the Sheffield School for the Blind 136 or 42.36% had been blinded by ophthalmia neonatorum. These startling figures led to the unanimous passage last month of a resolution proposed by Mr. Stevenson and seconded by Dr. Karl Grossman that in the opinion of the section on ophthalmology the time has come for the British Medical Association to take action toward the prevention of ophthalmia neonatorum.

In the state of New York as determined by the special commission for the blind, 1906-07, there were found to be 6,200 blind persons. Of these 569 were under one year of age — and under four years including those under one year were 959 children. While in the state of Massachusetts among 3,306 blind registered 661, or more than 20% had become blind before their fifth year. If we exclude ulcerative conditions due to bad hygiene and insufficient nourishment which ought to be controllable, and congenital blindness, which in many instances can be avoided by preventing the congenitally blind from mating, we may safely assume that one-half of this number or 10% of the whole have given their eyes as a tribute to ignorance or neglect.

It is important then that we learn under what conditions children are being born that make such an arraignment possible. The birth of a child, as Dr. McMurtry has said, is always a surgical process. Unfortunately nearly half of the births in our large centers are attended by midwives. Some of these women have had European training and are reasonably cleanly. A large proportion of them are simply impossible. A trained nurse who investigated the midwives of New York and reports her findings in a recent number of *Charities and the Commons*, describes an Italian as follows: "Her home," she says, "was the dirtiest, the condition of her hands was indescribable, her clothing was filthy and her bag beggared description." Concerning the midwives' homes, 106 were absolutely filthy as was the clothing and person of the midwife herself. As for the bags and equipment from a professional standpoint by far the greater number would make fit decorations for the chamber of horrors. Rusty scissors — dirty string — a bit of cotton — a few corrosive tablets — old rags and papers — some ergot and vaseline — a gum catheter wired, were the usual contents. Between nine hundred and one thousand of these women were present at the confinement last year of 43,834 mothers in the metropolis about 42% of the whole number of births.

In the city of Buffalo with a population of about 400,000, nearly half of the births last year were attended by midwives. The same proportions probably hold good in all centers in which the population

is largely foreign. The almost entire absence of ordinary cleanliness to say nothing of modern asepsis in the management which obtains at the births attended by these women produce widespread disaster and the amount of blindness which continues to result from this preventable and controllable infection is appalling. It is evident then that notwithstanding the efforts of the medical profession which have been almost unremitting for 25 years past, the facts are not yet widely understood nor are proper measures at all adequately employed for the protection of the new born infant from the danger of pyogenic infections. It is not alone moreover in the cases of children born with the assistance of midwives that these unfortunate results occur. While more generally than ever before right methods are being employed by medical accoucheurs especially by the younger and better trained among them there are always those by whom the importance of strict asepsis and the use of a suitable prophylaxis are not always remembered.

It has become evident then that more propaganda is not enough. Measures must be taken by the State not alone for the protection of the infant citizen from the criminal results of neglect, a right which he, through his guardians may justly claim and which it is the duty of the State to afford as well as a wise economic measure and a duty which the State owes to itself in saving itself from the burden of caring for the blind pauper such as he often becomes rather than a self-reliant and efficient producer.

It is evident then that the direct responsibility for the correction of the condition rests upon the State through its department of health. It is not enough moreover that we pass laws for the control of this plague. Many such laws are dead letters on our statute books. There must be such a public sentiment back of these laws as will secure their enforcement.

The first important factor in this problem then is to have more generally known and appreciated the large part that ignorant untrained and careless midwives are taking in the most important function that [illegible] of being born.

[illegible] when medical colleges will require a large [illegible] of the training of physicians. Many a young [illegible] the world lacking the practical experience that [illegible] which might have [illegible] but of well of necessity [illegible] eliminated as a factor in [illegible] she must be put [illegible] department.

[illegible] Law to fit themselves for the

work which they assume to do. If the uncleanly cannot be made to adopt modern sanitary methods — they together with the vicious and immoral, should be put out of business. Every midwife should be registered and licensed. She should be compelled to report every birth and every case of ophthalmia as soon as it develops. She should be trained as to the best methods of conducting the infants toilet — especially as to the care of its eyes.

If the midwife is to be held responsible for her neglect to use proper prophylactic measures under penalty of losing her license — as she should be — then she should have the prophylactic put in her hands with fullest directions for its use that no excuse may exist for omitting it.

It does not seem practicable to put ophthalmia neonatorum on the list of communicable diseases. Considering the fact that it is so frequently of gonorrhoeal origin many physicians feel that to report it — with the name of the parents would be a breach of professional confidence — but for the health officer to take a semi-annual or annual canvass of the number of cases occurring in the practice of the physicians, midwives, and institutions of the locality — together with a statement of what, if any, prophylactic was used with the resulting condition of the eyes in each instance, has a double value, — in serving to impress upon each one receiving the card the need of prophylaxis and in obtaining statistics from which important conclusions may be drawn. It affords an opportunity moreover of conveying information to the accoucheurs — that often may not, and soon would not be necessary — but meanwhile it might be instrumental in saving eyes that would otherwise be lost.

The conclusions, in detail then, which are suggested are:

1st. To secure the enactment of laws in each state or federal territory placing the supervisory control and licensure of midwives in the boards of health — requiring that all midwives be examined and registered in each county and that they be required to immediately report each case of ophthalmia occurring in their practice under penalty, if found guilty, of forfeiture of their license and fine.

2d. Distribution by health boards of circulars of advice to midwives and mothers giving instructions as to the dangers, method of infection and prophylaxis of ophthalmia neonatorum.

3d. The preparation and distribution by health boards of ampoules or tubes containing the chosen prophylactic. For midwives 1 per cent solution of nitrate of silver is almost universally recommended by obstetricians and ophthalmologists. For physicians the Crede solution which should consist of a 2 per cent solution of chemically pure fused

nitrate of silver. If used as directed by Crede, one drop from a glass rod, it is free from excessive irritation and absolutely safe. To insure purity of the drug and accuracy of dosage the Crede solution should be given freely to physicians who will make application therefor. This, however, should be merely advisory. The health department should be free to use such prophylactic as it may deem best.

The accomplishment of these measures by individual efforts must necessarily be futile: by coordinated action only can effective results be obtained.

At the recent meeting of the American Obstetrical and Gynecological Society held in Detroit, action was taken endorsing the efforts that are being made by the committee of the American Medical Association, and urging that suitable laws be passed in each state to control this plague. Similar action was taken last week at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, when the form of a prospective law was formulated, and its advocacy urged upon the members throughout the country. This law provided that the department of health in each state be vested with power and authority to publish and distribute such information and instruction, to furnish such remedies and to make such rules, regulations and ordinances as it may deem expedient to prevent the development of inflammation of the eyes of the new-born babe in public hospitals or institutions in which midwifery is practiced, and in connection with the practice of legally licensed midwives. It was further advised that in this enactment the department of health be authorized to enforce its rules, regulations and ordinances at the expense of the State, and providing a suitable penalty for their neglect

The obstetricians and ophthalmologists of the country are prepared therefore to advise what measures should be taken for the protection of the child from blindness It is to the department of public health in each state that the execution of these measures must be entrusted. It is, therefore, in accordance with the instructions of the American Medical Association, through its House of Delegates, that this vitally important subject is presented for your consideration, with a request that a committe may be appointed to work with us in securing the desired end

If we would protect the babies and future citizens of the United States from the poverty and misery of needless blindness we must join hands and unite our forces The control of this condition is absolutely possible and practicable The machinery is already in existence it is but to act

Such an organized and concerted movement steadily and effectively at work would practically stamp out ophthalmia noenatorum as a cause of blindness, thereby saving millions to the commonwealth and immeasurably increasing the happiness and efficiency of humanity throughout the world.

LEUCOCYTES IN MILK.

H. L. RUSSELL, Madison, Wis.
University of Wisconsin College of Agriculture

The subject of leucocytes in milk is one of considerable interest to the executive officer at the present time, as well as to the laboratory man. Laboratory men have had this subject under consideration for some time, but it has not been thoroughly considered from a general point of view. I will confine my remarks this morning to that phase of the question, in order to bring before executive men and those interested in general hygiene some of the findings in regard to this question of leucocytes in milk.

There have been a considerable number of standards proposed for the examination of milk, and the most recent one may be called the "leucocyte standard," or, perhaps, it is better to denominate it as the "cellular standard" rather than the leucocyte standard, because an important question arises whether the cells which are found in the milk sediment are all leucocytes or not.

The presence of pus in the milk is a thing not to be desired, and if we were thoroughly in accord with each other as to what constitutes pus it would be a simple matter to formulate a standard of this sort. Pus is an indication of a diseased condition in milk, but that condition may arise from a variety of causes. There may be pus as the result of contagious disease. There are a considerable number of infectious troubles which affect the udder of an animal in which pus is a prominent feature, and the exclusion of milk from such sources is entirely and wholly justifiable. It is quite possible that there may be pus [illegible] which does not originate from an infectious or contagious trouble, namely, what is ordinarily known by dairymen as garget, a term under which we may include a variety of udder troubles designated [illegible] as "garget." Any abnormal condition in milk which results in the production of a stringy, viscid, thickened [illegible] of various degrees of intensity is ordinarily denominated as garget. Many cases arise which have absolutely no relation to any contagious trouble. Where such milks are excluded it is justified by the character of the appearance rather than any positive proof of their effect upon the public health. No one, of course, would drink milk that was abnormal in color and appearance, and such milks even if produced by physiological gargets of a non-infectious character, should not be included in public milk supplies.

The question arises, What constitutes pus? Can a standard be formulated by an examination of the cellular elements which will represent pus? Should this standard be based upon quantitative or qualitative data? When pus is examined, it is found to be composed mainly of polymorphonuclear cells. But in cell sediments derived from milk there are other cells besides the polymorphonuclear cells. Not infrequently the eosinophiles are to be found in goodly numbers; also the mononuclear cells, the lymphocytes. Detrital material from the interior of the gland of the udder also occurs. We must, therefore, differentiate qualitatively between one type of cell and another.

Can a quantitative as well as qualitative standard be utilized? Can we say that a milk supply which contains a certain number of these cellular elements, disregarding their histologic nature, should be denominated pus or not? Boards of health have formulated not infrequently such a quantitative standard, and the question may naturally come up for consideration whether this is justifiable or not. Further consideration of this question shows that these standards vary much. The standards which were proposed five or six years ago have been modified in the interim several times, and in every instance have been made more liberal. Starting with ten cells per microscopic field, or fifty thousand per c. c., the standard has been increased to one hundred thousand; by others, to five hundred thousand, and in other instances to a million per c. c. There is at present no uniformity with reference to this quantitative standard.

We have received a number of appeals from the dairy interests in all parts of the country to know the scientific foundation for the formulation of such a standard as has been in use in a number of cases. Take, for instance, the city of Memphis. The city chemist of that city condemned from fifty to seventy-five per cent. of the milk supplies on the leucocyte content in excess of a certain given amount, and naturally dairymen are very much interested in this matter, which is one of financial importance to them. Professor Pearson spoke of the enormous business that is being carried on in the milk industry, and should we say positively if we find a certain number of cells in milk that it necessarily means pus? Physical examination of these herds from which these supplies were drawn revealed the fact that in the majority of instances not a single case of infectious disease or inflammatory disturbance could be found. If individual animals are examined under close veterinary supervision and fail to reveal any abnormality, are we justified in regarding the microscopic findings as evidence warranting condemnation of supplies, because a certain number of cell constituents are found? Does this re-

sult necessarily mean diseased milk? If this standard, as now accepted in many places, is put into operation, it will drive the dairyman out of business, and we will find the price of milk increasing to prohibitive rates. There are in some cities certified milk supplies that have been rejected on the ground of the high cellular content, even though such supplies were produced under the most favorable conditions. In some instances the attempt has been made to justify these standards by a scientific examination. One city having a numerical standard of this character has made an examination of its milk supply, and found a certain proportion of milks of high cellular content. It has sent out a milk inspector and he has found individual cases where cows were suffering from udder troubles. Such proof has been regarded as positive confirmation of the value of the standard selected, but, as a matter of fact, the examination made only covers one part of the proof, and that the least important part. An examination was not made of the low leucocyte milks to prove that these animals did not suffer from udder troubles. Anyone knows that these cases of physiological garget, lasting two or three days, often occur and then subside. If a thousand cows are taken and examined in the usual supervision [illegible] will often find in a large number of the herd [illegible] that is suffering from this temporary physiological disturbance. Most of this quantitative standardization has been developed from the examination of individual milks, but from mixed milks. It is quite impossible to formulate a standard under these conditions. We must go back to the farm and study the relation of these cell elements to the individual animal.

In regard to the technique or methods of examination, there is absolutely no uniformity at the present time in regard to the way in which the leucocyte content is determined. The two methods most generally in use rely on the concentration of cell elements on centrifuged cream and the centrifugalized sediment is examined either by [illegible] the same [illegible] glass tube and examining it microscopically [illegible] the sediment volume and examining a [illegible] the smeared sediment [illegible]. The laboratories that [illegible] have used one or the other [illegible] without comparative studies. In our experience we [illegible] that examination of milks gives us a [illegible] In practically all cases the results [illegible] sediment method are lower than by the volumetric method and we have found it impossible to obtain duplicates [illegible] sediment method that were satisfactory. The accuracy

of the volumetric method is much greater, and at the present time I believe it should preferably be used as a basis for further studies on this question. It may be that in time, after we have reached a basis for the formulation of a proper standard, other methods can be formulated of a more routine and rapid character, but at the present time it is absolutely necessary that the work done should be performed by technical methods that, at least, give comparable results.

A paper was presented at the laboratory section the other day by Mr. Hoffmann and myself, in which we have found a change in technique that seems to exert a material influence on the accuracy of the method used. This is merely to heat the milk before examining. In the ordinary method of examination a great many leucocytes are entangled in the cream, due to the formation of the fat globule clusters. If the milk is heated these fat globule clusters are disintegrated, and the globules are more homogeneously distributed through the milk serum, thus permitting gravity to exert itself upon the leucocytes in the heated rather than in the unheated milk. The institution of this slight improvement has given much more satisfactory duplicates than before. In a large series of samples treated in this way the average variation was found not to exceed two or three percent. Methods of analysis are gradually being improved, but the matter should be left in the hands of the laboratory men to perfect. The executive officer, however, desires a standard that he can use in his executive work, but he cannot at the present time use these methods with any degree of success, and laboratory men should be encouraged to go on in this field and develop a satisfactory technique as a necessary prerequisite to the formulation of any standards. At the University of Wisconsin we have now spent eighteen months in accumulating data on this problem. We have studied the distribution of the cell elements in milk from all possible points of view to see if we could establish any underlying law. We have examined different breeds to see whether any breed variation could be ascertained; also the effect of general care of the herds; the influence of lactation, oestrum or heat, gestation, parturition, age, and the influence of feeding to determine whether a high or low nitrogenous ration was productive of a high or low leucocyte content. All this data has been collated and studied from different points of view, and still one finds the widest possible variations. One thing appears to be true, that aged animals of six years and older, on an average, give a much higher leucocyte content than younger animals. Twenty-five per cent. of the healthy animals examined, over six years of age, showed a leucocyte content from 500,000 and 1,000,000 cells per c. c.; whereas, in animals under six

years of age there was only 4 per cent. As an animal grows older the leucocyte content increases. Why this is so, I do not know, but so far as our present data are concerned, the older animals give us an increased leucocyte content.

Another factor apparently affecting conditions is whether any indurations exist in the udder. This may possibly be associated with a history of a previous garget or mastitis. A hard fibrous condition of the udder may occur, and yet the udders yield perfectly normal milk.

So far as the cell content of the milk of the herd is concerned, it appears that those animals whose udders are affected in this way give a higher cellular content than those in which the udders are soft and flexible, and in a normal condition. The results are striking along that line. In some instances we have found animals having this fibrous condition in the udder and the milk showing a higher leucocyte content, and yet the milk was perfectly normal in every respect, so far as physical examination is concerned. If, upon further examination, it should prove true that such animals show no history of pus, it is a question whether it would be the part of wisdom to put forth a definite quantitative standard and use it as a basis for the rejection of milk supplies. I never have agreed to think where there is an actual inflammatory disturbance of the udder, the milk from that cow should be rejected, but there are many factors which may result in a slight congestion that may be purely temperamental in character. Such a congestion of the udder will set up a leucocytosis. The injection of cold water even a warm may often set up a leucocytosis which will continue for several days. This would have no positive sanitary significance, but it would relate itself to variations in the quantitative cell content of the milk. The methods must need modification and then a more liberal interpretation as to the significance of results.

[illegible] are subject to [illegible] attention [illegible] eliminating the [illegible] at the present time. In my judgment it would be a mistake just now to enforce the condemnation of supplies on [illegible] and render municipal or state boards of health [illegible] as advocating methods that are unsecure, because [illegible] data from which [illegible] scientific [illegible].

JUDGING THE SANITARY CONDITION OF DAIRIES WITH THE AID OF A SCORE CARD.

By R. A. PEARSON, Professor of Dairy Industry,
New York State College of Agriculture, Cornell University, Ithaca, N. Y.

We are beginning to learn some of the definite requirements for the production of clean milk. The subject has been under discussion a long time, and many notions have been advanced to soon perish. Many thousand dollars have been expended in the effort to put into practice impracticable ideas. At the same time knowledge of sanitary science in its relation to dairy industry has been increasing, and to-day we are able to state with considerable exactness the necessary or vital conditions governing the production of pure milk. These constitute our standard.

When we have a definite standard it is always helpful to have a definite system of measurement in some familiar unit. In our dairy score card we use numbers, and we are able to express what is accomplished toward reaching the standard by the use of a higher or lower number. This enables comparison of any given conditions with ideal conditions, or with corresponding conditions existing elsewhere.

The score card provides a system for measuring the excellence of conditions where milk is produced and handled and which have to do with the sanitary value or purity of the milk. In calling your attention to this card I would say that it is attempted to have it include mention of all items of equipment and methods that influence the wholesomeness of milk. The numerical values assigned to each topic represent perfection for that feature. When scoring a dairy the numbers are cut to correspond with the conditions found.

The points to be guarded in the production of milk for the market may be conveniently assigned to five groups,— the health of the herd, cleanliness in the stable, condition of utensils, cleanliness of the employes, cooling and handling the milk. If the condition of any one of these groups is very much neglected the value of the milk is ruined for the market As each group is of vital importance, it is assigned a total of one hundred points for perfection. By dividing all the points to be considered into five groups, with totals of one hundred each, it is possible to make a relatively heavy cut in the score for any serious condi-

tion found. This heavy cut gives the group a low score and the table at the bottom of the scoring sheet is so arranged that if any one group scores low the final score must be low. There are a large number of very important or vital points, and this scheme at the foot of the score card permits any one of them to count for more than would be its proportion in the ordinary way of using score cards.

Good judgment must be used with this score card as with all score cards. To assist the inspector a statement is made to accompany this score card describing briefly what is perfection of each point.

The value of the score card lies in the fact that the producer is permitted to see which parts of his work are in greatest need of improvement, and the inspector is aided by having in his hand a short, clean-cut statement to remind him of every thing to be noticed and its relative importance.

The following is a copy of the score card as we have used it the past few years.

DEPARTMENT OF DAIRY INDUSTRY, COLLEGE OF AGRICULTURE, CORNELL UNIVERSITY.

SCORE CARD FOR PRODUCTION OF SANITARY MILK.

Date ..... Dairy of ..... P. O. .....

			Defects.
I. Health of the herd and its protection.	Health and comfort of the cows and their isolation when sick or leaving time	4%	
	Lighting and ventilation of the stable	35	
	Food and water	20	
		100	
II. Cleanliness of the cows and their surroundings.	Cows	40	
	Stable	20	
	Barnyard and pasture	5	
	Stable air (freedom from dust and flies)	10	
	Total	100	

SCORE CARD FOR PRODUCTION OF SANITARY MILK.

Date ..... Dairy of ..... P. O.....

III. Construction and care of utensils.	Construction of utensils and their cleaning and sterilizing.....	40	.....
	Water supply for cleaning and location and protection of its source	25	.....
	Care of utensils after cleaning....	20	.....
	Use of small-top milking pail....	15	.....
	Total	100	
IV. Health of employees and manner of milking.	Health of employees.....	45	.....
	Clean over-all milking suits and milking with clean, dry hands..	30	.....
	Quiet milking, attention to cleanliness of the udder and discarding fore milk.....	25	.....
	Total	100	
V. Handling the milk.	Prompt and efficient cooling.....	35	.....
	Handling milk in a sanitary room and holding it at a low temperature	35	.....
	Protection during transportation to market.....	30	.....
	Total	100	.....
	Total of all scores.....	500	

If the total of all scores is	And each division is	The sanitary conditions are
480 or above.....	90 or above.....	EXCELLENT
450 or above.....	80 or above.....	GOOD
400 or above.....	60 or above.....	MEDIUM
Below 400....Or any division is below 60..		POOR

The sanitary conditions are..... Scored by.....

A BRIEF DESCRIPTION OF WHAT CONSTITUTES PERFECT UNDER EACH HEADING.

I. *Health.* No evidence of chronic or infectious disease or of acute disease in any member of the herd on the dairy premises. Freedom from tuberculosis proven by the tuberculin test made within one year

Comfort Protection from weather extremes Stall comfortable, — at least 3' wide for a small cow, or 3½' for a large cow; length of stall sufficient for cow to rest easily Sufficient bedding Frequent out-door exercise.

Isolation Removal of cows to comfortable quarters outside of the dairy stable, when sick or at calving time.

Location of Stable Elevated, with healthful surroundings

Lighting As light as a well lighted living room, and with not less than four square feet for light from the east, south or west, for each cow

Ventilation An adequate ventilating system of the King or other approved pattern, and, except when the stable is being cleaned, no marked stable odor

Food Clean, wholesome feeding stuffs, fed in proper quantities

Water Clean, fresh water free from possibility of contamination by disease germs

II Cows Cleaned by thorough brushing and where necessary by washing, [illegible] before milking, and by washing just before milking, leaving the udder damp to cause dust to adhere [illegible]

Stable Free from accumulation of dust and dirt except fresh manure in the gutter Apart from horses pigs, privy, poultry house, etc

Barnyard and Pasture No [illegible] plants no mudhole nor pile of manure or any decaying substance where cows have access

Stable Air Free from floating dust and odors Light partition or floor between the space occupied by cows and that used for storage of feed or other purposes [illegible] during milking

III Construction of Utensils No absorbent material and every part accessible to the brush, and, except inside of tubes, visible when being cleaned.

Cleaning Thorough cleaning with brush and hot water and rinsing each utensil in clear water No laundry soap Thorough sterilization in special apparatus

Water, from a source known to be pure, protected from contamination from seepage, or surface drainage

Care of Utensils Such as to avoid contamination by dust as well as coarser dirt

Small-top Pail —with opening not over seven inches in diameter, and at least one third of this opening protected by hood

IV. Employees,—free from contagious disease and not dwelling in nor frequenting any place where contagious disease exists.

Milking Suits,—freshly laundered and clean; ample to protect from dust and dirt from the milker's person or clothing.

Milker's Hands. Hands and teats dry when milking. Hands thoroughly cleaned before milking each cow. Wash basin and clean towel in stable or milk room

Milking Quietly,—so as to avoid dislodging dirt from cow's hair At least four streams of foremilk from each teat to be discarded into a separate vessel.

V. Cooling. Cooled within fifteen minutes of milking, to temperature below 45 degrees F.

Handling,—in a room used exclusively for handling milk, and free from dust, dirt and odors; and the milk after being cooled, always at a temperature below 45 degrees.

Protection during transportation. Protected from dirt by tightly closed receptacles, temperature always below 45 degrees F.; not delayed in transit, reaching market within twenty-six hours after milking.

The following statement shows the amounts cut for some of the more common defects. This statement is to be used as a guide. It is not intended to include all possible defects, but it would suggest a proper cut for almost any defect not included:

HEALTH OF THE HERD AND ITS PROTECTION.

No tuberculin test	12
Old tuberculin test (over 1 year)	12
Stalls in poor repair	5
Rigid stanchions	3
Light fair but not ideal	1
Light poorly distributed	3
Light poor when doors closed	5
No light except from doors	12
No special ventilation (such as King system)	2
Ventilation not good (only fair)	7
Ventilation very poor	15
Isolation stall in same stable	5
Cows calving in stanchions	5
Isolation stall not comfortable	3
Stable poorly built to protect from weather	10

CLEANLINESS OF COWS AND THEIR SURROUNDINGS.

Small amount of manure on 1 or 2 cows, not on udders or flanks	2
Small amount of manure on majority of herd, not on udders or flanks	4
Large amount of manure and dust on cows,—udders and flanks	14
Hair about udder not clipped	1
Udder not cleaned except when noticeably dirty	4

Brush or burlap used on udder just before milking	5
Damp cloth not used before milking	2
Large amount of cobwebs, dirt and dust in stable	10
Large amount of dry litter on floor	5
Small amount of cobwebs, dirt and dust in stable	2
Hay kept in cow stable	4
Stable not whitewashed	5
Old whitewash	2
Horses in same stable	5
Stable open to privy contamination, pig pens, etc	10
Manure not removed once a day	10
Large amount of manure and water in barnyard	10
Small amount of manure and water in barnyard	5
Wet manure piled up near stable entrance	5
Dry manure near stable entrance	2
Mud hole in barnyard	4
Ceiling not tight	3
Feeding hay just before milking	13
Feeding dry corn stalks just before milking	7
Feeding grain just before milking	2
Feeding green corn	2
Floor swept just before milking	15
Floor swept one half to three quarters of an hour before milking	5
Floor not dampened just before milking, if dry	1
Musty odor in stable	2
Too much odor of manure in stable (not very bad)	2
Odor of old milk (spilled on floor)	2

CONSTRUCTION AND CARE OF UTENSILS

No special sterilizing	5
Scalding pails and cans from one to the other	15
Returned milk bottles not properly cleansed	12
Use of cistern water for washing utensils	3
Exposure to dust after cleaning	3
No small top milk pail used	15
One of two pails a small top	7
Source of water a well in barnyard	15

HEALTH OF EMPLOYEES AND MANNER OF MILKING

Use of burlap apron during milking	3
No special milking suits	5
Hands not clean	10
Milking with wet hand	10
Foremilk not discarded	2
Rubbing head on cow during milking	3

HANDLING THE MILK

Efficient cooling (not 50° F or below)	10
Not cooled below 70° F	15

Not held at 50° F. or below	5
Milk strained in stable	10
Milk room opening into barnyard	5
Milk room in wood shed	4
Milk room in poor condition	10

Where an exceptionally competent milk inspector cannot be employed, it is found to be helpful for the inspector to use a question sheet, the questions being in considerable detail and arranged in groups or topics in the same order as the different topics are mentioned on the score card. Thus with this question sheet, the inspector will secure information upon all necessary points, and an expert in the office can quickly assign numerical values. The question sheet, therefore, may be a means of getting greater uniformity in the work when many inspectors are working, as well as a great assistance when poorly trained inspectors must be employed.

The question sheet adapted for use with our score card follows:

DEPARTMENT OF DAIRY INDUSTRY, N. Y. STATE COLLEGE OF AGRICULTURE.

MILK INSPECTION.

Dairyman ..... Date .....
P. O..... Location .....
No. Cows milking..... In herd..... Qts. Milk.... Cans or Bottles.....
Milk sold to..... License No.....
Report by..... At milking time?..... Hour .....M.

I. Health of the herd and its protection.

Do all cows appear healthy?.....
Are udders sound and free from signs of disease?.....
Are cows tuberculin tested?.....
Date of last test..... By whom.....
Number of cows added to herd since last test.....

Is the stable well built to protect from the weather?.....
Are cows brought in during bad storms?.....
How many hours are the cows out daily?.....
Width of stall..... Length .....
Is the stall comfortable..... How are the cows tied?.....
Kind and quality of bedding.....

Where are cows kept when sick and at calving time?.....
In separate stable?..... Comfort of place.....

Is the stable well located?.....

Number and size of windows..............................
Number and size of windows .... . . **Distribution of light** . .
Are the windows clean?
Size of the stable, length............**width**..........**height** . . ..
Number of stalls . ..
How ventilated? ....

Kinds of feeds used.................. ....
Are they of good quality and proportions?............
Source of water for cows.................................
Method of watering Cleanliness of troughs.. ....

II. *Cleanliness of the cows and their surroundings.*

Are the cows clean? . . ... How are they cleaned? . ...
Is the hair clipped about the udder?.. ....
Is the udder cleaned before milking? How? How long before .

Is the stable free from accumulation of cobwebs, dirt and dust? . .
Is the stable white washed? How often?
Kinds and number of other animals, if any, in same room with cows
... .
Same, adjacent rooms . ... What openings between?
Is the stable protected from such sources of contamination as privy, etc . ...
How often is the manure removed from the stable? . .
How far is manure removed from stable?
Is the barnyard free from manure pile? And mud holes? . ...
Is the pasture clean and free from injurious plants?
and mud holes? .

Is the stable provided with dust tight ceiling? And partitions?
Stable floor of wood, cement or ground? Repair of same
...

Is feeding done before or after milking? How long before?
Is the floor swept and sprinkled before milking? How long before?
Is the air free from dust and odors

III. *Construction and care of the utensils*

Are all utensils such that they can be thoroughly cleaned?
Method of washing utensils? .
How are the utensils sterilized? .
How soon after milking are utensils washed?

Is the water used for washing utensils pure? How do you know?

What is its source?
Is the source protected against contamination?

How are utensils kept after cleaning?

Is a small top pail used for milking? If so, what style and size of opening? . . .

IV. Health of employees and manner of milking.

What evidence is there of absence of contagious disease and of exposure of family and employees to disease?.....

Who is the family physician?.....

Are the milkers clean personally?.....

Do the milkers wear clean over-all suits?..... How often are the over-alls washed?..... Are the suits kept in a clean place?.....

Do the milkers wash their hands just before milking?.....

Where? .....

Do milkers have hands wet when milking?.....

Are milkers careful not to dislodge hair and dirt from the cow while milking? .....

Is the foremilk discarded?.....

V. Handling the milk.

How is the milk cooled?.....

How soon after milking is the milk cooled?.....

To what temperature?.....

Is the milk handled in a room detached from the stable?.....

How far from stable?.....

What kind of floor?..... Repair of same.....

Is the milk room used exclusively for milk, and is it free from dirt odors? .....

At what temperature is the milk kept after cooling?.....

How is milk cared for during transportation to market?.....

CONSTRUCTION AND CARE OF STREETS, FROM A PUBLIC HEALTH STANDPOINT.

Dr. M. MARQUEZ, Chihuahua, Mexico.

Fonssagrives considers the street as the hygienic unity of the cities, and it may be said that the health conditions of a town are worth as much as the streets forming the same. If the streets have a great deal of importance as means of communication, under the standpoint of hygienics, they are ample sources for the sun's rays to penetrate the residences, carrying the vivifying air, so as to produce the necessary elements for the maintenance of animal and vegetable life.

Therefore, the construction of the streets, in the first place, is subject to the orientation which shall give to the houses the most exposure to the sun during the shortest days in such a manner that the sun's rays shall bathe, at least, each facade of the two limiting the said houses, during four hours from 10 A. M. to 2 P. M., which fact can be accomplished by submitting the direction of its centre in regard to the indications of the climatic conditions, latitude, and especially those of each locality; as we know that the rule for the orientation of the streets has, as starting point, the scientific study of the penetration of light into the houses, and the factors to be considered are the latitude of the place and the medium angle formed by the sun's rays with the horizontal plane of each locality Through a mathematical formula it can be determined the width of a street and the height of the sidewalks forming the same, thus for a given latitude and orientation, the sun's rays may reach the lower floor of a building during the shortest days in the year.

The application of this formula produces general results. The streets in a direction from north to south require less width than the perpendicular ones, or those from east to west, for giving a better light Between these two directions, considered as extremes, are included in this angle of 90 degrees, the width of all the others and the very important consequence derived from this is, that in order to obtain a good exposure to the sun at any place on the earth, the width of a street is, not only a requisite of height of the houses, but a requisite of the angle which is formed by such street h the meridian, and therefore it is indispensable to keep in mind ntation, in order to determine the width of the streets and

the height of the buildings. In the modern cities and in the new streets built in the old ones, it is given to such streets the most of the amplitude as permitted by the local conditions, in such a manner that we have there a great central way for vehicles and tramways; narrower on both sides for pedestrians and between both gardens or passages for persons on horseback, bicycles or automobiles.

The depth of a street is the consequence of the height of the buildings and it is entirely subject to such, and it can be affirmed that it shall always be in an inverse ratio of the width.

The longitude and direction of the streets has also a very remarkable influence on healthy conditions. The straight and long streets, when they are built subject to what we have stated above, favor the ventilation of the rooms and the drying of the floor in damp places. The strong air currents upon displacing themselves produce the same effect as caused by a double-acting pump, forcing forward and sucking by the opposite side and make the ventilation of by-streets, especially when these are perpendicular to the direction of the wind. These air currents, if it is true that they favor the ventilation of a town, in exchange in the great arteries of populous cities they molest and produce other inconveniences. Besides, if the straight street is ample for the traffic and beneficious for hygienics, it is monotonous and it might be desired that the same would present interruptions from distance to distance, such as gardens, squares, parks, etc.

For paving the streets, which pavement shall have a slight convex shape, ought to be preferred sufficiently strong materials, durable, of an easy and economical preservation, to be as noiseless as it can be made, by reason of traffic, and finally that the wear and tear be as little as possible, thus producing the least quantity of dust, which is highly obnoxious by reason of its mechanical action in attacking the mucous membrane, facilitating the introduction of a great many microbes, of which it is a constant vehicle. Out of macadam, wood paving and compressed asphalt, this last one mentioned must be used, as besides having the above named conditions, it presents a smooth surface, without any spaces between, which may be washed with abundance of water and in small spaces; this pavement is beautiful and comfortable if there is plenty of water to allow the washing out of mud which is formed if such washing is not properly made; in these conditions of cleanliness it gives proper security to transients, either on foot or on horseback, and the only objection against it is the radiation produced by the smooth surface and which makes it uncomfortable during the warm weather.

The sub-soil must be solid, water proof, so as to avoid in filtration, and its contamination to the pavement as also to the drainage courses, which shall have a sufficient inclination for the rapid flowing of waste liquids, of the storm water, which should always be separated and conducted in different tubes or pipes from those used for the drainage of the city.

The planting of trees on the streets, squares and public promenades, modifies the hygienic conditions in a very favorable manner, provided the trees shall not prevent the buildings from receiving light and air it shall also be a good improvement for the convenience of transients and for public hygiene to establish at certain distances and especially on the [illegible] streets urinals and water closets, provided the same are kept in good sanitary order and clean.

Unhealthiness [illegible] of the streets, constitute a very appropriate [illegible] and development of pathogenic [illegible] by the active traffic or by the wind [illegible] are deposited on the dresses, eatables [illegible] the breathing and digestive organs the bacilli of tuber[illegible] typhoid fevers, diphtheria, pneumonia and others [illegible]

[illegible] with pure water two or three [illegible] and most appropriate proceeding to avoid [illegible] and although it has been said [illegible] of germs as according to [illegible] is destroyed by desiccation [illegible] of such disease, it is not [illegible] the irrigation of the streets, notwithstanding, [illegible] demonstrated that bacteria existing [illegible] several times during the day [illegible] Besides the diffuse or direct [illegible] experiments made and which are noted [illegible]

[illegible]

after one hour of being directly exposed to the sun. In addition to this it is demonstrated that the vegetative forms of damp bacteria are more sensible to the action of disinfectant agencies than when the same are dry. In consequence, irrigation is a very powerful prophylactic means against infection caused by dust in the streets, not only because it makes it settle and prevents its being raised by the wind, but it also produces a certain degree of sterilization in diminishing the number of bacteria. But it is indispensable that such irrigation be made regularly, several times during the day, so as to keep the surface of the pavement always wet, using the purest water obtainable, and finally, the dampness so produced modifies and refreshes the breathing temperature and causes it to be more agreeable.

That cleanliness in the public way, the gatherings of sweepings and uncleanness, its transportation and its final destination, shall be made in such a manner that neither persons, objects nor air might be infected, irrigation as mentioned above, shall be previously made, either during the evening or early in the morning, when the traffic is less, and such sweepings being yet damp, shall be gathered and conveyed in convenient vehicles to some place where the same are separated. Whatever may be utilized out of them, such as fertilizer for agricultural purposes or otherwise, shall be divided, exercising all hygienic precautions, and the balance shall be burned in crematory furnaces so that the same are totally destroyed.

As the streets belong to the city, it shall not be permitted that out of the houses there may be thrown any waste, filth or dirty water, nor to clean any dresses, carpets, etc., and especially any animal's dung, on which microbes find very intense elements for their culture, for from it emerges flies and other obnoxious insects carrying with them some transmissive diseases. It shall be convenient to advise that waste inside of the rooms be gathered in metallic vessels which can be hermetically closed, in order to avoid the deleterious emanations proceeding from them on their being taken out to be conveyed outside of the city.

The health conditions of a city are in direct ratio with the cleanliness of its streets on which rooms communicate and from which the same receive ventilation. Cleanliness is much less expensive than a sanitarium, is more powerful against tuberculosis, preventing it better than any other means for treating the same in all cases confirmed. In the dirty streets and causeways, in the dresses which we use and which collect all dry and pulverized mud, are to be found the bacilli and where the contagion takes place. The pavement or soil of parks and promenades is generally the origin of tuberculosis in the

infants as the children playing their usual games remove the sand or earth from the floor, which keeps or carries the germs of infection and which inspired by the children form the starting point of this terrible disease.

CONCLUSIONS.

Under the above, we believe ourselves authorized to arrive at the following conclusions in the affirmative

1 In order to determine the orientation of the streets, the conditions of climate, latitude and those especially adapted to the locality should be considered.

2 The width of the streets shall have to be subjected to the orientation and height of buildings limiting the same, and, as a general rule it should be tried to give it the greatest extension, so as to have ample ways for transients, either pedestrians or on horseback, etc The depth depends on the height, and the longitude should be straight, interrupted at distances with parks, squares or gardens.

3 The pavement of the streets must be hard, resistant and water proof, so that the wear and tear be as little as possible and which may produce the least quantity of dust by reason of traffic; that the same be noiseless and that the cleaning of it may easily be made, the repairs to be [illegible] and [illegible] be given to transients

4 The subsoil shall be protected against infiltrations proceeding from the surface which is sure to obtain if the pavement is water proof with the sufficient inclination and a good installation of the drainage pipes and [illegible] for rain water, running in separate courses

5 The cleaning of the streets shall be made during the time when there is the least traffic irrigating copiously, which irrigation shall be repeated as many times as may be necessary to keep the pavement wet

6 Waste, sweepings etc shall be conveyed in vehicles adapted to [illegible] purpose to the place of its destination there the same shall be [illegible] using these for fertilizing agricultural lands, exercising a [illegible] process systems and the latter shall be completely destroyed in [illegible] furnaces

EXPERIMENTS.

Dust was gathered from the street and was passed through a sieve number five of the Knoppe scale for the purpose of obtaining uniformity in its composition such dust was divided into lots of fifty grammes which were placed in watch glasses, one-half of them were dampened or moistened with even quantities of sterilized

water and some of them were exposed to the direct light of the sun and others to a diffuse light; the other half or portion was carefully submitted to the influence of the light in similar conditions as the former, so as to be used as comparison.

With the moistened dust, there were made three series: the first one was irrigated three times a day with fifty cubic centimetres of water; the second one, once a day with an even quantity, and the third only once during the time of the experiment, which was carried on day and night, keeping the glasses in the same place.

Every eight hours the samples of dust were comparatively observed, both wet and dry, and there made sowings under culture methods, proceeding in the following manner: in order that the weights be correct, to each lot of fifty grammes of dust were added five hundred cubic centimetres of distilled water, shaking the whole so as to have a good mixture, during 10 minutes the mixture was moved with a small glass rod, previously sterilized; one cubic centimetre to a temperature of five degrees centigrade (Celsius) was taken afterwards of such mixture which was at the time mixed with an additional five hundred cubic centimetres of water, and finally one cubic centimetre of this last mixture was used to sow in plates of agar, in accordance with the methods of Koch. The results obtained refer to one ten thousands of dry dust, and to get the spores the mixture was kept during one hour in water bath (balneum Mariae) over eighty degrees and was carried afterwards to the stove over thirty-seven degrees.

The experiment demonstrated: that the diminishing of bacteria in dust irrigated three times a day was greater than on those not irrigated or dry, as it may be seen by the number of germs:

	Direct light.	Diffuse light.
Dry dust	2,225	3,382
Damp dust	1,111	1,585

Unfortunately the experiment could not be made in the dark with which we might have obtained the action which directly would correspond to dampness.

Considering the above facts, it can be seen that the wet dust, exposed to the solar light, direct or diffuse, present a fewer number of germs than when it is dry.

THE PUBLIC ROAD IN ITS RELATION TO THE PUBLIC HEALTH

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A question that is asked almost daily by the unthinking American is: What possible relation has the public road to the public health? It is somewhat appropriate, therefore, to select and put on your program two papers dealing with this question.

There is an apocryphal story in science which serves my purpose, at least, well enough. It is related that at one time the flavor of the famous Stafford shire cheese was nearly lost. Sir John Lubbock, the great naturalist, after a prolonged investigation announced to the farmers of Staffordshire that the best restorative measure, in his judgment, would be the importation into Staffordshire of a large number of cats. When pressed for the reasons for such an extraordinary prescription, he said that the flavor of Staffordshire cheese was given by a certain kind of clover that grew in great abundance in Staffordshire; but that the field mice fed on this clover in such numbers that they had destroyed the roots of the [illegible] and that the only [illegible] was the only element in stress [illegible] the [illegible] would be lost to the flavor [illegible]

Now whether that story is true or not, it serves to illustrate [illegible] delicate [illegible] which [illegible] between [illegible]

It is certain that the public road is the greatest factor [illegible] probably more than ninety per cent of all the dust we inhale is manufactured [illegible] the improvement of our public roads and streets [illegible] the public health [illegible] the high [illegible] It is only necessary to [illegible] that which must appeal [illegible] to show, in its true aspects, that the dust problem is a [illegible] We must consider some of the [illegible] which are connected with the building of the highways. I refer particularly to the great volumes of dust which are thrown into the air by the constantly increasing rubber tired traffic. The [illegible] has grown tremendously in importance with the [illegible] and the road engineer is particu-

larly confronted with it, because from this point of view roads which were adequate for iron-shod traffic are gradually disintegrated by the automobile. That road is best adapted to its purpose in which the amount of dust that is taken off of it is replaced by the grinding action of the traffic that goes over it. In order to hold a stone road down there must be dust upon the surface. The entire cementing of the surface of a road is done by fine particles of dust, and, therefore, under the old-fashioned iron traffic as fast as dust was removed by wind and rain, it was replaced again by the grinding action of the wheels and horses' hoofs upon the coarser aggregate making up the rough surface. With rubber-tired automobiles, however, owing to a vacuum which is formed by the contraction of the pneumatic tires, the dust is sucked away from the road surface and carried up into the air, where the wind distributes it over the neighborhood. No more dust is formed, and the road goes to pieces. This phase of the subject may not particularly interest you. Your inquiry, as I understand it, is: What happens after the dust is taken off the roads, and what is the effect of the dust, after it is distributed, upon the public health? You are better judges of that than I am. But you will be interested to hear something of what is being done by road engineers and students of this problem, in order to prevent robbing the roads and the consequent distribution of dust.

We have many ways, nearly all of them still in the experimental stage in which we are attempting to meet this problem. In the first place, you have probably heard of the oiled roads of California. It was necessary to keep the dust down in California because the oranges and other fruits, when once covered with dust, were no longer saleable in the market for as high a price as when free from dust. As one of your speakers has pointed out, men arouse themselves to public action as soon as they find it to their private interests to do so. Men do not, as a rule, consider problems such as this on broad philosophical grounds, but as soon as it begins to touch their pockets they organize to cure the evil. California was a pioneer in dustless roads, merely on account of its fruit interests. It happens that Providence has been kind to the state of California. The local oils in that state differ from the oils elsewhere in the world in the fact that they contain a very high asphaltum base, so that when spread on the road the volatile portion of the oil evaporates and leaves the asphaltum as a binder. When the oiled roads were successful in California it was assumed by engineers, particularly in France, and afterwards by some of our Eastern engineers, that oiling was the proper treatment for roads and would prove to be an universal cure for the dust nuisance. This, however, has

not been the case, and it has been found that the oils of other parts of the world frequently, though not invariably, contain a petroleum base instead of asphaltum. In such a case the result has been that when the volatile portion evaporates the parts of the oil left behind are greasy, similar in consistency to vaseline. Such an oil does not adhere and bind the surface of the road, but is picked up by passing traffic, distributed upon peoples' clothes, and is altogether inefficient. So much for the many failures of oil treatment of roads.

Calcium chloride was then suggested for use on roads. This is a by-product manufactured in some of the great chemical factories of the world and can be obtained at a comparatively low cost. Calcic chloride is hygroscopic, and when in a dry condition will absorb water from the atmosphere, and retain that moisture. The theory of its use is that by distributing it upon the surface of the road, its ability to absorb water from the atmosphere or hold it after rain has fallen prevents the road drying out so that dust can not form. Furthermore, calcic chloride has mild antiseptic properties so that the addition of it to the water, when roads are treated with it, should be found beneficial. I would suggest to our medical men to use your influence with the road authorities in your home places so that some of these things that have been found helpful may come more rapidly into general use. It is quite possible to treat roads in the neighborhood of great cities with solutions of calcic chloride, although the expense may prohibit their use in the country districts. Experiments have been made with various oil emulsions, made by mixing crude oil and common soap with water. These have been used with some success in park ways, not only keeping down the dust but naturally exerting a certain antiseptic action.

Those of you who have visited some of the more progressive cities in this country know that a number of park ways and macadam roads are now treated in this way. In Boston, the condition of affairs now as compared with a few years ago is noticeable to every visitor to that city. The air which used to be continually dust laden is now comparatively free, and the people who live in the houses along the avenues where the great automobile traffic is no longer complain of the dust which formerly entered their houses through every crevice and open window.

I refer to the use of the crude heavy oils that are the high suburban or rural type of petroleum products, which through their specific gravity have been found to give excellent results. My office in cooperation with the Massachusetts Highway Commission has treated a number of miles of road in this way this summer, and the work ap-

pears to have been successful. So there are things we can do, and what we need now is a more widespread education of the people along these lines. You gentlemen as well as we public officials know, that the people of the United States are not unintelligent, but they stand in need of education in regard to problems affecting public health. The average American citizen, I think, is too apt to be skeptical. There is a story (probably you have all heard it) that illustrates this: A farmer who saw a dromedary for the first time, after looking the animal over carefully and studying it, turned to a man and exclaimed: "O, get out, there is no such animal." (Laughter.) That really, in my experience, pretty well illustrates the frame of mind of the ordinary American citizen when one attempts to educate him in relation to many of the great problems with which he is face to face. Agents of our office have traveled over this country from coast to coast and from north to south in an effort to increase interest in road building in this country. There are over two million miles of public roads in the United States, and only seven per cent. of them are improved. I have noticed that, wherever I see bad roads, I invariably see neglected, unkempt, unwashed children. If I travel along a good road, I see children well cared for. I do not say that one thing directly follows the other, but they undoubtedly go together. A community that is negligent of its roads will be negligent of its children, and a community that is negligent of its children will not produce good citizens, nor, above all things, will it have a high standard of public health.

THE SANITARIAN'S RESPONSIBILITY TO EMBALMERS

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Laws, rules and regulations have been formulated for the safeguarding of the living against infection from the dead, but as yet action has been, perhaps, too much along theoretical rather than practical lines. State boards of health, state and national funeral directors' associations, [illegible] and individual health boards and others, have had certain practical problems of embalming to deal with for years and attempts are being made to secure preliminary training in and to test by examination the capacity of those who are legally to engage in embalming. The funeral directors [illegible] state and local [illegible] own state. [illegible] aggregation of the different [illegible] rules and regulations governing the disposal of the dead [illegible]

[illegible]

different conditions. Funeral directors wish to know more, and cannot expect much help from the commercial houses, which seem to be fearful that their interests will be jeopardized by an increase in knowledge on the part of their customers. This is probably a very hasty conclusion, since the firms which supply hospital fixtures, drugs, surgical appliances, and other necessities to physicians, do not seem to be affected, except beneficially, by an increase in knowledge on the part of the medical profession.

At present only one fluid has received official approval, and that is a fluid which was compounded in Minnesota during the investigations undertaken for the Minnesota State Funeral Directors' Association at first by the Minnesota State Board of Health, and later with the help of Prof. Geo. B. Frankforter, dean of the college of chemistry of the University of Minnesota and professor of chemistry in the college of medicine and surgery of the same university.

This work had its origin eight or nine years ago when the Minnesota State Funeral Directors' Association asked for the collaboration of the Minnesota State Board of Health. The original request was for the testing of fluids already upon the market, with a report to the association of their germicidal and embalming value. This was objected to on the grounds that it would furnish advertising material which might be unscrupulously used by commercial firms and also because if the association wished to secure the best results, it should undertake the compounding of its own fluids and the publication of formulæ, so that all of its members would be free to compound their own fluids or have them compounded, thus reducing cost and yielding fluids of known purity, strength and germicidal value. The investigation finally ended in studies looking to—

(*a*) Compounding of fluids;

(*b*) Sanitary test of such compounded fluids, and

(*c*) The perfection of methods of embalming.

Bactericidal efficiency was determined both by observations in the test tube, and in human bodies which had been embalmed where full details of methods employed were recorded. This work was continued in 1904 on the request of Mr. W. L. Grapp, chairman of the committee on embalming fluids appointed by the Minnesota State Funeral Directors' Association. Methods were devised for these tests and Dr. R. H. Mullin, of the staff of the department of pathology and bacteriology of the University of Minnesota, undertook the work for the State Board of Health. The results of his work were embodied in a report to the State Board of Health, and have been included in a paper entitled, "A Sanitary Test of Embalming Fluids," presented by

[illegible] at the annual meeting of the National Funeral Directors' [illegible] on September 4, 1929.

In fact the methods employed at this time were the testing of [illegible] fluids secured in the open market by a committee of the State Funeral Directors Association and forwarded by them to the laboratory. The experiments were carried through without the publication of the names of any of the fluids. Two methods were utilized in the testing of the fluids as follows:

[illegible]. A pressed mass culture of typhoid bacillus and staphylococcus pyogenes aureus was grown in human pleural fluid in order to furnish conditions somewhat comparable to those in the human body. This was divided into test tubes, each containing [illegible] added to each tube in the first series of experiments, [illegible] in the later series [illegible]. Some fluid embalming [illegible]. This represented [illegible] to 150 and 8 to [illegible] of the water [illegible] of the fluid employed in embalming [illegible] to be used in the ordinary [illegible].

[illegible] to germicidal [illegible].

[illegible] fluids were later tested [illegible] the accumulation of an [illegible] embalming [illegible] used in every [illegible] embalming [illegible] accurately [illegible] rabbits were [illegible] ascertain [illegible] had been killed. The sites [illegible] made were kept constant [illegible] these fluids [illegible] and [illegible] the results [illegible] dissection [illegible] were [illegible] Association [illegible] these [illegible] was finally chosen [illegible] the state and the United States [illegible] National Funeral Directors Association [illegible] has been engaged for three years in extending the

work originally undertaken in Minnesota. From reports, based on the results of actual use by embalmers and from all experimental data available, this fluid seems to be very satisfactory, and by some is pronounced the most satisfactory fluid in use. This opinion, coming from the funeral directors and embalmers means, of course, that from the aesthetic point of view, it is satisfactory. Concerning the sanitary value of this fluid there is no doubt, although probably, modification might be recommended in regard to the method of its employment for certain classes of cases. This fluid has been approved by the Minnesota State Board of Health and by the Conference of State and Provincial Boards of Health. Its formula is as follows:

Formaldehyde	14 per cent.
Glycerine	5 per cent.
Borax	3 per cent
Boric acid	1 per cent.
Saltpeter	3 per cent.
Eosine (20 c.c.)	1 per cent. solution

At present the embalmer is held rigidly in certain locations, and seems likely to be held in others, to the use of a fluid which must contain 14 per cent. of formaldehyde, which makes it safe; but since the formula is approved, an "approved disinfectant" must also contain the other ingredients. There are doubtless many other formulæ which might be as good and perhaps better than this formula, but there is no mechanism available for their study. The National Funeral Directors' Association made a very limited appropriation and has no experts and laboratories with which to carry on investigations. Nor, on the other hand, have the Conference of State and Provincial Boards of Health, the baggageman's association or other interstate associations, the mechanism for such necessary experimental work, unless it be referred for the United States to the United States Public Health and Marine Hospital Service. The American Public Health Association has, however, the facilities through its different sections, of dealing with this matter and it is presented to the Association at this time in order to secure, if possible, concerted effort on the part of sanitarians throughout this continent, so that standard methods of dealing with the legal and executive as also the practical and technical aspects of the question, may be formulated. Three ways of approaching the problem from a sanitary view point present themselves:

1. Exact specification of methods and fluids on the part of the sanitary authorities, with restriction of the embalmer to such methods and formulæ, could be employed.

2. The embalmer might be encouraged to undertake experimenta-

tion in the compounding of new fluids and the utilization of new methods, by permitting considerable latitude in the actual details of his work. This involves a very rigid supervision by an efficient corps of inspectors and a system of reporting, the results of which would be very difficult to tabulate, as also an expensive machinery in the way of chemical, bacteriological and experimental laboratories, for the testing of fluids and methods by some central sanitary authority.

3. However, since our knowledge concerning embalming, is as yet fragmentary, it would seem advisable for a committee of this Association including executive officers, chemists and bacteriologists, to cooperate with a committee from the National Funeral Directors' Association in the laying out of a definite program of study for the evolution of standard methods to be employed in:

(a) Actual embalming,

(b) The preparation of formulæ with details concerning methods to be employed in the use of various fluids, and

(c) Chemical, bacteriological and other tests of methods and fluids.

In regard to the preparation of formulæ and the specification of methods of embalming which might be permitted by the various sanitary authorities, it will be necessary to formulate some definite plan.

As the committee would distribute responsibility and work, interesting the various municipal, state or provincial and research health laboratories both in the compounding of fluids and in the testing of fluids and methods submitted to them. On the part of the embalmers all suggestions and requests for the examination of fluids, should come through some representative body, so as to eliminate a very great deal of [illegible] which might be requested by interested or ignorant people. At the very outset it will be necessary to determine whether any fluids or methods proposed to be brought under patent will be examined.

[illegible] are very active in their fight against the public [illegible] these firms are now manufacturing [illegible] and it will be necessary from time to time [illegible] determine whether they are up to standard. [illegible] becomes necessary to examine [illegible] The whole problem is far reaching and [illegible] the preparation of formulæ [illegible] as well as the [illegible] observing and tabulating [illegible]

The National Funeral Directors' Association meets within a few days, and I am authorized to state that the fluid committee of that association will welcome suggestions and assistance in carrying forward this work.

In conclusion, it would appear that if this is of any sanitary importance at all its international and interstate relations, demand cooperation in the working out of the many details which are involved. The solution of such far reaching problems should not be confined to any one state, and it is earnestly hoped that the interest and cooperation of all sanitary authorities and research institutions may be secured with a resulting division of responsibility and labor. The devising of technique for the compounding and testing of formulæ together with suggestions in regard to legal restrictions undertaken jointly by the American Public Health Association and those who are chiefly interested, namely, the National Funeral Directors' Association, seems to be the most logical method of procedure.

the physician to the patient who can discontinue treatment whenever he chooses; by the very act of appointing you to office, the public has said to you: "Our health is in your hands." And as, in individual practice, the necessity is now more widely recognized of securing the patient's interest and co-operation, so it is an important part of the health officer's business to secure *public* interest and co-operation in his program.

The problem, therefore, to which this paper wishes to direct your attention is — *How can adequate support be secured for the policies and programs of health departments?* The answer proposed is — *By an effective publicity of budget and report.* The prospect may seem at first sight very unpromising. It will be said: "The public is not interested in figures. How can you give publicity to a thing which nobody will read?" The objection is only too valid, as figures are now presented. The departmental estimate is often an unintelligible jumble of figures, while "report" has come to be almost a synonym for "dulness." Who ever heard of an ordinary citizen, impelled by neither self-interest nor a civic conscience, sitting down to read a departmental report? But that public health reports need be dull, who will maintain? Even statistics can be made interesting.

Imagine a health department which borrows a leaf from organizations in the industrial world, and so keeps its accounts and records that it can tell definitely what service is rendered in return for the expenditure of certain sums of money. When that department presents its periodical estimate and request for appropriation, it is able to say: "With the present appropriation we are inspecting a certain number of dairies per month. At this rate, each dairy is inspected on the average once in a year. The conditions found are the following: use of water that may become contaminated at any time; filthy dairies, careless methods of handling milk, etc. To remedy these conditions dairies should be inspected at least once in two months. The number of inspectors must therefore be multiplied by six. If we receive an appropriation enabling this increase, we pledge the department to an inspection of that frequency."

In such a statement there is nothing that needs to be abstruse or complex, nothing that can not be made intelligible to citizens at large. On the contrary, when graphically presented, it has news value that will give it a circulation and find it a reading. Graphic presentation is not necessarily yellow journalism; graphic presentation is not inconsistent with professional dignity or etiquette. It is in no wise like the advertisement of the quack; it is rather the summary report of an executive officer to his board of directors.

[illegible] has two results. First, it immediately places on a [illegible] basis the relations between the department and the appropriating body. The latter in its capacity of representing the public [illegible] the position of being able to demand certain definite services in return for appropriations granted. Instead of an unintelligent [illegible] which arbitrarily cuts departmental estimates by a [illegible] the appropriating body, which is naturally jealous [illegible] and the requesting department [illegible] can come together on the [illegible] basis. That is, certain amounts of money are now spent, [illegible] are now obtained, the needs of the case appear [illegible] can apparently be met with a certain [illegible] increased expenditure. Second, it arouses public interest [illegible] department's program, for the public is interested in increased [illegible] and is on the whole ready to recognize it whenever effective [illegible] appropriating body is indifferent to the requests of the department [illegible] Board wants. If tuberculosis clinics are not [illegible] for a suspension of their work for two weeks [illegible] that the funds would be immediately forthcoming [illegible] application of this method of supplying [illegible] to the appropriating body and to the public can [illegible]

[illegible] It is receiving its demonstration in the practice [illegible] departments, notably the health department. [illegible] the departmental estimate of the Board of Health, [illegible] Board of Estimate and Apportionment was for $1,731,451. The previous year the Board of Health had asked for $1,510,000 and received $1,313,000, in the regular budget. [illegible] the year 1916 however special revenue bonds [illegible] $892,257. For several years back [illegible] percentage the health department [illegible] the subsequent issue of bonds to [illegible] This practice was unsatisfactory from any point of view [illegible] to the Board of Health or the [illegible] the coming year it prevented [illegible] from making any far-reaching plans, and forced it [illegible] Hospitals had to be built and [illegible] It became the [illegible] department only [illegible] This practice apparently [illegible] and that [illegible] was unbusinesslike and

way, and that the only way to keep expenses within bounds of reason was to keep them continually on a short tether; to give a small appropriation in the first place, and then dole out through the year what there seemed to be no excuse for denying. The fallacy of this position was that there was no more certainty after delay than before, as to what was or was not necessary to the health of the city. Postponement brought no enlightenment. The root of the difficulty was that neither the health department in making its request nor the finance department in making the appropriation had in its possession *the facts of cost of the different branches of the health service.* The different heads in the health department's accounting system did not correspond to the functions maintained. There were upwards of twenty-five functions or lines of work maintained and only eleven accounts. For example, the second account was "Salaries of Officers, Clerks, Inspectors and Other Employes." This was termed the "main roll," and included work of every description, from milk inspection to sanitary inspection of back yards; from maintenance of hospitals to diagnosis of horses for glanders; from the manufacture of serums in laboratories to the conduct of departmental stables; in a word, a general catch-all. Not even the accountants knew what men were performing service in the various divisions. Supplies were voted in a lump as "Supplies and Contingencies," irrespective of the administrative divisions in which they were to be consumed. It was therefore impossible to arrive at even an approximate statement of cost.

On the other hand, it was almost equally impossible to arrive at an accurate statement of service rendered. In "Sanitary Inspection," for example, the total number of inspections was given, but no idea as to the nature of the inspections, whether of milk shops, slaughter houses or back yards. In milk inspection the total number of inspections and certain other data were given, but so fragmentarily as to afford no real criterion of the service.

All this is not brought forward as a criticism of the health department of New York City, which is well known for its progressive attitude. The same situation existed in many of its aspects in other city departments. Neither cost data nor reports of service had been demanded as a basis of administration or of appropriation. In its appreciation of the importance of *doing* the work the health department lost sight of the importance of *making that work known*, as the *means* of being able to *do more*. As soon as the above analysis of the situation was laid before Dr. Darlington and his associates, Dr. Biggs and Dr. Bensel, they recognized its truth and at once took steps to remedy the conditions. In collaboration with the Bureau of Muni-

cipal Research, an analysis of the department's pay roll expenditure according to functional divisions was presented to the Board of Estimate and Apportionment, as a supplement to the regular estimate which was still in its hands. The new presentation of the case resulted in a budget appropriation of $1,847,819.00, an increase of over 30 per cent. over any previous budget appropriation.

And in connection with the general question thus raised, resolutions were passed by the Board of Estimate and Apportionment and by the Board of Aldermen requiring departmental estimates to be segregated according to functions. A committee of the finance department has for some months been engaged in revising the forms of departmental budgets and accounts, so that in future appropriations, items shall have direct reference to the functions of the departments concerned. The department of health has adopted a new form of report which will much more effectively demonstrate to the public the service it is rendering in each of its lines of activity.

The American theory is that government is controlled by public opinion. Yet it is apparently the last thing to occur to many public officials, when they are in need of support for their policies, to go directly to the public and ask for what they want. If an industrial corporation, seeking a charter, is expected to submit its balance sheet to the financial interests whose support is desired, why should not a public official, seeking an appropriation, expect to lay before the public and its representatives a statement, based on past experience, [illegible] and extent of the proposed program? He will be in a far better position to secure the size of his appropriation. Whatever the [illegible] in order to secure the maximum service [illegible] be provided with the means of administrative control [illegible] system of accounts and records. The same device will be one of the most effective means in securing an adequate appropriation. He will make his request for funds and his reports of [illegible] in graphic form based on modern principles of accounting and reporting, and he will be rewarded by adequate funds.

[illegible] public welfare possesses such a publicity value [illegible] It requires only some ingenuity to turn the [illegible] dollars and cents. *In the end, health officials of the country will realize that the opportunity at their hands of [illegible] is their real experience with the public [illegible] and are the most valuable and socially enlarged [illegible]*

MEAT INSPECTION OF THE FEDERAL DISTRICT.

DR. JOSE DELA LUZ GOMEZ, MEXICO CITY, MEXICO.

Fulfilling the requirement of Article 131 of the Sanitary Code in force in the Federal District of the Mexican Republic, the Superior Board of Health has at its disposition at present a competent staff, composed of professionals, who watch strictly the soundness of the meat as food.

This staff has sufficient knowledge to find and to value pathological lesions and to discover quickly all alterations in fresh meat.

It will be seen by the preceding that the inspection has official character and is performed by veterinary physicians, legally authorized, and managed by a chief inspector of the work done, he being the means of communication with the board of health.

Fourteen veterinarians serve in the slaughter houses of the Federal District, of whom one is the chief director of the service, nine are inspectors, and four aspirants to this charge. Their office is established in the city slaughter house, divided in two sections: the first, used for the business of the department, and the second, (of large dimensions) devoted to the bacteriological laboratory.

The examination of the animals to be used for public consumption is made in life and *post-mortem*. The first is made the day before killing, with the object of separating the sick and suspicious animals. If from this first examination some are sick or possibly tuberculous, tuberculin is applied. At present, and in order to save time, the pure tuberculin is used diluted in water at the rate of 1% and applied in small incisions, Von Pircher's process. The results are satisfactory up to date because it saves labor, giving the best results in least time.

The second examination, post-mortem, is observing the lesions and proving their nature, by laboratory work. In addition is sought the agglutination of the bacteria from which they have fresh cultivations. If from this investigation it is found that the lesions are classified, and capable of contagion or transmission, all remains of the beef are ordered to be destroyed by fire.

Precipitate serums are also prepared in this laboratory to distinguish the origin or the class to which the beeves belong, using for the same purpose mineral acids which acting on the meats, they emit odors of the species from which they are derived.

The knowledge which the inspectors possess in comparative anatomy

of domestic animals and the pathological anatomy save all the difficulties which some cases present.

Finally, all the meats which come from the slaughter houses have stamped upon them the seal of health and the retail houses are also watched daily by the inspectors.

Today we inspect monthly in all the slaughter houses of the Federal District, 11,000 to 12,000 beeves, from 16,000 to 17,000 sheep and goats, and from 8,000 to 9,000 hogs, making a total of from 36,000 to 38,000 animals.

The present exposition has no other object than to know if the great American nation follows the same method or has others more efficient, for it is the great desire of the undersigned that the system applied in both countries, whatever it may be, shall reach the greatest uniformity, as this should bring good results to the public health and to commerce in general.

OFFICIAL REPORT OF THE PROCEEDINGS OF THE THIRTY-FIFTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALH ASSOCIATION.

MONDAY, SEPTEMBER 30, 1907.

The Laboratory Section held its meeting at the Marlborough-Blenheim Hotel, under the chairmanship of Dr. Hiblert W. Hill, of Minneapolis, Minnesota.

TUESDAY, OCTOBER 1, 1907.

FIRST DAY — MORNING SESSION.

The Association met in the West Solarium, Marlborough-Blenheim Hotel, and was called to order by the President, Dr. Domingo Orvanaños, of Mexico City, at 10:30 A. M.

THE PRESIDENT: We will now listen to announcements from the Chairman of the Local Committee of Arrangements, Dr. Guion.

DR. E. GUION, of Atlantic City: As Chairman of the Local Committee of Arrangements, I take great pleasure in welcoming you to Atlantic City. As you will notice by the program, ther are certain entertainments to be given, so that it is unnecessary for me to mention them in detail.

THE PRESIDENT: We will now listen to the reading of the minutes of the last annual meeting.

DR. HENRY D. HOLTON, of Brattleboro, Vermont: Inasmuch as the minutes of the last annual meeting have been printed in the volume of transactions and read by the members, I move that the reading of them at this time be dispensed with.

This motion was seconded by several and carried.

THE PRESIDENT: The next order is the report of the Executive Committee by the Secretary.

THE SECRETARY: The Executive Committee has held two meetings since arriving here, and has considered the applications for membership of a number of applicants. The Executive Committee has one or two other matters to bring before the Association at this time.

A report was received from the Laboratory Section of the officers nominated by that section subject to the approval of the Association.

Chairman: Nomination not made with the understanding that the name of Dr. James Carroll, Washington, D. C. (lately deceased), the Vice-Chairman of last year be understood to fill the place.

Vice-Chairman: Dr. J. J. Kinyoun, Washington, D. C.

Secretary: B. R. Rickards, Boston, Mass.

Recorder: Dr. H. D. Pease, Albany, N. Y.

Council.

Dr. H. W. Hill, Minneapolis, Minn.
Dr. Joseph Girard, Mexico City, Mexico.
Mr. R. S. Weston, Boston, Mass.
Dr. Edward Bartow, Urbana, Ills.
Mr. H. B. Baldwin, Newark, N. J.

The Executive Committee wishes to recommend that these officers be appointed by the General Association.

Dr. [illegible]: I move that the Association endorse the nominations of the Laboratory Section.

[illegible] was seconded by several, and carried.

[illegible]: The question of making some changes in the manner of holding the meetings of the Association was discussed by the Executive Committee last evening, and the committee wishes to recommend to the Association that the arrangements for our meeting next year and subsequently shall be as follows: The Association shall meet on Tuesday morning at 10 o'clock, there being no section meeting on Monday as heretofore. After calling the Association together [illegible] the meetings of the various sections. We have at present [illegible] sections with the possibility of a third being [illegible]. On Wednesday and Thursday mornings the various sections will hold their meetings, there being general meetings [illegible] on Tuesday, Wednesday and Thursday afternoons at [illegible], if necessary, with a concluding [illegible] as heretofore. The Executive Committee [illegible] and Place for the next annual meeting as well as [illegible] Association.

[illegible]: What action will the Association take on this report?

[illegible]: I move, sir, that this [illegible] Executive Committee [illegible].

[illegible]: I second the motion.

[illegible]: Is it understood that the general meetings are to be held [illegible] the section meetings in the morning?

THE PRESIDENT: Yes, sir.

The motion was then put and carried.

The Secretary then submitted a list of applications for membership which were recommended by the Executive Committee to the Association for election.

THE PRESIDENT: You have read the list of applications for membership. What disposition will you make of these applications?

PROFESSOR FRANKLIN C. ROBINSON, of Brunswick, Maine: I move that the Secretary be authorized to cast the unanimous ballot of the Association for the list of applicants as read.

The motion was seconded by several.

Accordingly, the Secretary then cast the unanimous ballot of the Association, as instructed, and they were declared duly elected.

THE PRESIDENT: We will listen to the report of the Committee on Organization of a Section on Vital Statistics, Dr. John N. Hurty, Secretary, Indiana State Board of Health, Chairman.

REPORT OF COMMITTEE ON ORGANIZATION OF A SECTION OF VITAL STATISTICS.

J. N. HURTY, M. D., CHAIRMAN, INDIANAPOLIS, INDIANA

The Committee on Organization of a Section on Vital Statistics was appointed by the president in accordance with the following resolution passed at the meeting of the Association held in Mexico City in December 1906:

Resolved. That a committee of five be appointed by the president of the American Public Health Association to report on the organization of a Section of Vital Statistics at the next meeting of the Association, and that it be authorized to notify registration officials in the countries represented in the Association, particularly inviting their attendance at the next meeting, and to prepare a constitution for approval by the Association and adoption by the Section at that time.

The committee appointed by the president is composed as follows:

J. N. Hurty, Chairman; Cressy L. Wilbur, John S. Fulton, Jesus E. Monjaras, Chas. A. Hodgetts.

The committee has fulfilled the provisions of the resolution and respectfully presents: The purpose of the organization is to bring about a closer official and personal association of the registration officials of the several countries composing the American Public Health Association; to promote the introduction of effective systems of registering vital statistics; to aid the adoption of uniform methods of collecting, preserving, correcting and compiling registration records and of

publishing the statistical data derived therefrom in the most useful form, especially for sanitary purposes; to conduct the active co-operation of the American Public Health Association with the government agencies of each country and with other organizations interested in the improvement and use of vital statistics to report on the actual condition of the international classification of causes of death as employed in vital statistics reports and bulletins, and to formulate recommendations for its decennial revision, to help in the better reporting and classification of the mortality of occupations, to prevent and discuss papers relating to vital statistics both in the section meetings and in the general sessions of the American Public Health Association; and in general to promote a proper appreciation of the necessity and importance of vital statistics as an absolutely essential basis of modern public health work, and to improve the character and status of registration service.

In accordance with the program prepared by the program committee of the general Association, a meeting of those members interested was held in the Marlborough-Blenheim Hotel at Atlantic City, New Jersey, September 30, 1907.

The business of the Association [illegible] and sections [illegible] and a meeting of the Section on Vital Statistics was duly held.

Temporary organization was effected by choosing I. N. Hurty as chairman and Cressy L. Wilbur as secretary. The consideration of the constitution prepared by the committee was first taken up, and herewith is presented the document which was finally agreed upon, the same having been considered and approved by sections and as a whole. And your committee [illegible] recommends its approval by the Association.

The [illegible] the following amendment to the [illegible]

[illegible] OF THE [illegible] PUBLIC HEALTH ASSOCIATION

IX. The Executive Committee shall consist of the President, Past Vice-Presidents, First Vice-President, Second Vice-President, Secretary, Treasurer and Chairmen of the various sections, [illegible] active members of which three shall be selected annually by ballot to serve two years, and who shall be ineligible for re-election for a second successive term, (3) of the ex-presidents of the Association, (4) of the Chairman and Secretary of the Laboratory Section and the retiring chairman of that section, (5) the Chairman and Secretary of the Section on Vital Statistics and the retiring Chairman of that Section.

After the adoption of the constitution, the meeting resolved itself into a conference upon questions pertaining to vital statistics. The opening paper was by Cressy L. Wilbur and was entitled, "What Are the Chief Needs of American Registration?" The reading and discussion of this paper occupied the time until noon adjournment. At the afternoon session four other papers were read and discussed, namely, "Development of Vital Statistics," by Henry D. Holton; "Methods in Use in the Maine Registration Office of Checking up Returns of Births, Marriages and Deaths," by A. G. Young; "The Use of Vital Statistics," by Wm. C. Woodward; and "The Mortality from Consumption in Small Cities," by F. S. Crum. At the session Tuesday morning the papers read and discussed were: "Some Comparative Vital Statistics of Ontario and Michigan," by A. Blue. "A Method of Dealing with Unregistered Deaths," and "A Method of Computing the Average Age at Death with Practical Demonstration," by Marshall L. Price; "The Importance of Uniform Methods in the Presentation of Vital Statistics," by Wilmer R. Batt. Six other papers were presented.

In conclusion we will say — There is a large field of usefulness for a section on vital statistics, and we think what has so far been done, is an earnest of that usefulness.

THE PRESIDENT: You have heard the report of this committee. What action will you take on it?

DR. GARDNER T. SWARTS, of Providence, Rhode Island: I move that the report of the committee be accepted and adopted, including the recommendation for the creation of such a section as mentioned in the report.

DR. PETER H. BRYCE: I second the motion, but in so doing, I wish to say there is only one thing connected with it which I think should receive the special consideration of this Association, and that is the relationship of this new section to the general Association. There was a title given to this section in the report which has been read, and which, it seems to me, hardly comports with the ideas of some of us with regard to whether these new branches or sections, organized for technical work, should be called simply sections of the American Public Health Association. If I understand the title, according to the report read, it is "The American Association of Registrars of Vital Statistics." It appears to me it would be well for the homogeneousness of our work that we should call these a section on vital statistics, a section on bacteriology, or biology, etc. I would move, therefore, that the constitution and by-laws, which have been presented to us by this committee for approval, be adopted, and that the section be called

"A Section on Vital Statistics." This is an amendment to the wording we have in the report. (Not seconded.)

DR. CHESTER I. SAVAGE: For the information of the Association I will say that this same question came up before the Laboratory Section last year. There was a desire on the part of some members to reform the resolution presented, making this section a distinct association having a distinct title as though it were an association not a member of the American Public Health Association. If I am correct that question was voted down, and the section is still to be known as the Laboratory Section of the American Public Health Association as I understand the matter, the contention of Dr. Bruce is that this should be a Section on Vital Statistics. There seems to be a tendency to have distinct organizations which the public do not understand although those who believe in these systems have a distinctive name which I have some explanation to offer.

DR. JESSE D. WOOD, Washington, D. C.: I believe the full text of your resolution [illegible] Registrars of Vital Statistics [illegible] Public Health Association [illegible] that the whole subject [illegible] parent association is matched on the state. For the purposes this section, with the title we have, seems a little more suitable than if it were simply known as a Section on Vital Statistics. The latter title does not [illegible] that should be known as a national association [illegible] the purposes for which we desire to organize registrars. The proposition was originally made to organize a section of the parent association. I suppose at least I have been a member of the American Public Health Association for many years [illegible] the Laboratory Section as a branch of the American Public Health Association, but we should not altogether desert [illegible] Registrars' Association of registration [illegible] we'll meet on all official occasions. Organized as a Section of the American Public Health Association we will be amply sufficient to cover the whole topic that have [illegible] by the Association.

DR. [illegible], Minneapolis, Minnesota: Since an [illegible] Laboratory Section I change its name [illegible] who have quite [illegible] Dr. Wood [illegible] bringing the matter up [illegible] should have distinctive titles. It is perhaps

a minor matter, but if we call the statistical section "The American Association of Registrars of Vital Statistics" it sounds better, and I think it adds dignity to the Association. It would give to this new section the title to which it is properly entitled, if it represents what it is supposed to represent.

DR. JOHN N. HURTY, Indianapolis, Indiana: Another argument in favor of retaining this name is that it preempts that title. It is quite certain that when the registration area is extended to other states (and you see what it is now by looking at this map on the wall), we might have a national association which is complete and separate from this. But that is not desirable. For instance, in Washington last year was organized a society called "The Society of School Hygiene." That, really, ought to be a section of this Association, but instead they organized as a National Association of School Hygiene. When spoken to as to why they did not organize as a section of this Association, reasons were presented similar to those that have been mentioned. This is a powerful organization, and I believe if we had accorded them a distinct title, they would have come in as a section of the American Public Health Association. Of course, from some points of view it is undesirable; from other points of view it is desirable, in that it will increase our membership. It would strengthen us in many ways. It will increase the membership of the other national associations of that kind which might be formed and likewise increase their strength. I sincerely hope that the American Public Health Association will permit this name for this section. It will represent the American Association of Registrars of Vital Statistics, organized as a section of the American Public Health Association. I hope that this title will prevail.

MR. R. S. WESTON, of Boston, Mass: As I opposed the adoption of the longer name at the meeting of the Laboratory Section, I may be pardoned at this time for giving my reasons for so doing.

The title suggested and proposed for the Laboratory Section was "The American Association of Public Health Laboratories Affiliated with the American Public Health Association." In the first place, this title seemed too long. Then it seemed that the term Public Health was inclusive enough. A man by stating that he was a member of the American Public Health Association implied that he might be competent along laboratory or other lines. We should have for our section name something to distinguish it among ourselves alone, but not necessarily to distinguish the section or the details of membership in the Association for the benefit of the outsider. Our standing with the public is as members of the American Public Health Association,

and although [illegible] of one or more of its sections, the general name should satisfy all the necessities of publication. The name proposed for the laboratory section did not seem to me to fit the facts. I am trying to make a case where, if a man were called into court to testify as an expert and should say that he was a member of the Association of Sanitary Engineers affiliated with the American Public Health Association, the statement would not have much meaning, whereas if he should say that he was a member of the American Public Health Association and then, if necessary, a member of the sanitary engineering section of the statement would be more definite and would carry far greater weight with the court. It is customary in everyday life that children should be first distinguished by their family names. Intimates, however, know them more familiarly.

A Motion was made to second the remarks of Dr. Walker and Dr. Hurty, and ask that the American Public Health Association, who is acting as sponsor to this new born child be magnanimous and grant as our desire.

[illegible] to accept the invitation of the American Public Health Association [illegible] the sanitary affiliated sections have [illegible]

[illegible] meeting [illegible] the Association [illegible] great British Medical Association and [illegible] Association, on what a great association with [illegible] that every one here interested in public [illegible] to be a member of the American [illegible] sections. [illegible] these [illegible] Association [illegible] Public Health Association [illegible] thanks [illegible] [illegible] what the great interests of the American public health work in this movement demands [illegible] but because I [illegible] to be familiar

with public health conditions, and I considered myself a better member of the Association because I was an officer of both branches. If we start to form sections and call them, for instance, the Association of Vital Statistics, the Association of Public Health Laboratory Workers, the Association of Municipal Engineers, the Association of Municipal Health Officers, etc., it would seem an unwise thing to do. We are all public health men, no matter to what department we belong, and all these branches should be united and work together. It is true, the workers are in the sections, and yet it would be well for the members of the sections to come to the meetings of the Association and discuss with us all questions pertaining to the general aspects of American public health work. The technical work they can very properly discuss in the respective sections, because they are members of boards of health or are officers of them.

I hope, Mr. President, before we vote on this matter, we will study the broad bearing of the whole question of forming sections. If not, we will very easily lose the broad characteristics of the Association in the sections, and we shall lose in that way the great purposes for which this Association was created. (Applause.)

DR. CRESSY L. WILBUR: With reference to the word "affiliation," we have not used it, nor did we think of that expression in connection with the organization of this Section. The full title proposed by the section is the "American Association of Registrars of Vital Statistics, organized as a Section of the American Public Health Association." It is organized as a *section* of this Association. In other words, it is a child of the American Public Health Association. For many practical purposes, we feel it is desirable that we should have a somewhat independent existence and be recognized to that extent, at least. The section can deal with minor questions of statistical procedure as they come up, while major questions with important sanitary relations will be submitted to the American Public Health Association for approval.

DR. ARCHIBALD BLUE, of Ottawa, Canada: We have in my province a magnificent stretch of land, the whole length of the Niagara River, and it has been designated by statute as "Queen Victoria Niagara Falls Park," the name being almost as long as the river. I do not believe in long names or long titles, and I would suggest that this Association follow the example, as regards sections, of the American Association for the Advancement of Science, and the British Association for the Advancement of Science, designating our sections by letters and short titles. For example, I would say the American Public Health Association, Section A, Bacteriology; American Pub-

lic Health Association, Section B, Vital Statistics. I am sure that the shorter title would be in every way more suitable for our purposes. (Applause.)

Dr. Hibbert W. Hill. Dr. Bryce is unquestionably proud of his boy. I am also proud of mine. But I want my boy to have a name of his own, as, for instance, Hibbert Mosse Hill. And so as a section of the American Public Health Association, we would like to have a Christian name as well as a surname.

Dr. Henry Mitchell of Asbury Park, New Jersey. When this Association was organized it was composed of physicians, engineers, educators, members of various other professions, and laymen. They were enthusiastic advocates of all measures which promised promotion of the public health and prevention of the spread of disease. They were not then sanitary specialists, but in the course of time the progress and development of the art of public hygiene has brought all of the disciples of Hygeia into the ranks of specialism, and the membership has undergone a great change. Instead of being predominantly with practitioners of sanitary work, a large number of those who are now members of this organization are officially connected with the national, state or municipal administration of public hygiene, and in the future we can probably expect that a still larger proportion of our members will be paid officials. One consequence of these changes in the personnel of the membership has been the grouping of men in various specialties, and it seems to me a perfectly natural outcome that these various sections or departments should be organized, and that they should prefer to pursue the study of their chosen branches of the general subject. To distinguish these groups or sections by appropriate titles is of course desirable and necessary, but it would be unwise to convey the impression, in the selection of such titles, that these sections are separate organizations, for it would in my opinion detract very much from the strength of the various departments to be known as sections of the American Public Health Association, and I believe every local member of the organization [illegible] would be followed. I understand that the [illegible] on this section is being considered to be known as the Section on Municipal Hygiene, and it and each of the sections would, I think, gain by a distinctive name, it would weaken [illegible] Association.

Dr. Frederick H. Haynes. I move, Mr. President, that this report, with the recommendations as to the name as submitted, be adopted with the exception of the name of the section, and that this matter be referred to a committee to be appointed by the President.

This motion was seconded by several, and after Dr. Swarts had withdrawn his original motion, it was put and carried.

The President appointed as members of this committee Drs. Henry D. Holton, Peter H. Bryce, Henry Mitchell, Samuel H. Durgin, and J. J. Kinyoun.

Dr. Cressy L. Wilbur, Chief Statistician, Bureau of the Census, Washington, D. C., read a paper entitled, "The Outlook for a General System of Registration of Vital Statistics." (See paper, page 11.)

DISCUSSION.

DR. JOHN N. HURTY: It would be impossible to emphasize before this body to a greater degree than Dr. Wilbur has done, the very great importance of accurate registration of vital statistics. He has read a most excellent paper, and we all appreciate it. It is a valuable contribution to this subject. This was evident from the manner in which we applauded his statements while he was reading the paper. But he says, what will we do? We talk, for instance, about the weather, but nothing is done. And we talk about vital statistics from time to time, and do very little To be practical, we must do things. We must take our knowledge and use it. We must practically apply to every day life the laws of Nature.

We discuss milk and the importance of having pure milk. We discuss infantile diarrhœa and cholera infantum, and yet we have few birth and death certificates of an accurate nature, and unless we take this matter in hand, as Dr. Wilbur proposes to do, we will not know in the slightest degree what results are being produced. Dr. Wilbur used that illustration, but permit me to repeat it. If we wish to get at the fundamental work in which we are engaged, to produce practical results, we must, as an Association, exert ourselves in this direction. We must have a measure of health and of life and of death in this country, through vital statistics.

As Dr. Wilbur has said, foreigners look at us and wonder why we have laws and do not obey them. It is our disgrace, of course. We have been trying to collect accurate death certificates in Indiana. We are getting over ninety-five per cent. of the deaths recorded, while the United States Census Bureau requires but ninety per cent. The result has not been secured through the medical profession. I am not surprised at this, and yet the medical profession, as represented by the Indiana State Medical Association, has done everything it could to help the work on, while individually the members of the medical profession have not come forward and helped as they should do. They have been coerced; they have been compelled to report. We are

now prepared to give a complete registration of births, and I am sorry Dr. Weliver did not put a question mark upon the map of Indiana.

Dr. Weliver. I will do so if you say so.

Dr. Harris (Resuming). We are now sending out regulations for the purpose of collecting births. We have the law behind us, with a severe penalty. We will be able to collect accurate statistics of births in another year. We have learned a lesson, and that is, physicians will not report deaths unless they are compelled to do so, and I will tell you how we compel them. I mentioned this in the section meeting, but the new present did not hear it. If a dead body is buried in Indiana with out a permit, and that permit must not be issued until a certificate of death is returned complete, the coroner disinters the body, and secures the necessary data required on the death certificate. We also have a special police officer, whose income is dependent upon fees, and he is continually on the watch for instances of illegal burial, and so it happens the corpse lies in the house until the attending physician makes out a certificate of death, and hence physicians are prompt in making reports. We feel confident, therefore, that we are securing very accurate registration of deaths. But with births it is another matter. Our law says, that births shall be reported within twelve days after their occurrence. That is a mistake. We asked the legislature to make it immediate. It should be done at once. This error we hope to have corrected. The penalty of not reporting, a feature in our law, is as follows: for the first offense, a fine of from ten to twenty dollars; for the second offense, a fine of fifty to one hundred dollars; and for the third offense, one hundred dollars. A clause in the law was stricken out at the last minute when the bill was on its final passage, namely, that upon a third conviction for failure to report deaths or births the physician should lose his license to practice. This provision was opposed by the Indiana State Medical Association, not as a matter of principle, but as a matter of policy, as the medical profession. We feel that we are doing some effective work in this line, and I must say, the representatives of the different states here cannot do a better work for the public than to take up the matter of securing accurate registration.

[illegible] suggest to [illegible] that a uniform system of laws might [illegible] the legal profession in [illegible] attempt to make land [illegible] Difference in the local laws [illegible] why we get no statistics and information of

that kind is not the same in character in every state. The law in many states depends upon the disposition of people who know nothing at all about the subject, and for this reason it receives very little attention. The national authority is the proper source from which we should get suggestions of proper laws on a subject which is of national importance, and I would suggest that Dr. Wilbur, in closing the discussion, touch on this and the advisability of influencing legislation in this way, so that each state may know what every state is expected to do, and will proceed to assist the whole country in getting a system of laws sufficiently uniform to make the statistics of one state comparable with those of another.

DR. HENRY MITCHELL: I would like to say, that in an experience of about fourteen years in New Jersey, we have found that it is not a question of law, but one of enforcement of the law. In some of the municipalities in our state, we have local officers who are indifferent, poorly paid, who do not comprehend the value of prompt and accurate service, and consequently we have poor service in many localities so far as the collection of returns of births is concerned.

I was present yesterday for a few minutes at the meeting of the Section of Vital Statistics, and I listened with interest to the statements of various speakers who are officially engaged in this work, these statements showing that we are passing through a period of experimentation, and I do not believe that any two of the gentlemen referred to are pursuing the same course in their attempts to obtain full and complete returns of vital statistics. In our state we hope to improve the quality of these returns by the aid of our local registrars. We are now licensing all appointees of local boards of health, including registrars of vital statistics, and these men, before obtaining their licenses, must show by an examination that they are fitted for their duties. Whether this is the best way of accomplishing the purpose we are aiming at is, of course, a question, but it seems to me it is along this line we should direct our efforts in the enforcement of the law. We are told that in Florida a law is on the statute books which not only prescribes a penalty of two thousand dollars for failure to report births, but also provides for a long period of imprisonment, and yet the results are not satisfactory. It therefore appears that failure to obtain certificates of births is not alone due to the lack of a suitable law nor to the provision of a penalty of startling size, but to failure to enforce the law.

DR. WILBUR (closing the discussion): Dr. Mitchell has hit the key-note of the whole subject in the statement he has made, namely,

that it is not the law, but its enforcement. If we could enact a law that would enforce itself, it would be comparatively easy to secure effective registration, but we cannot make a law that some one will not ignore. At least, no one has succeeded in doing that yet.

The American Public Health Association has been co-operating with the Census Bureau for five years along that line, namely, in laying down principles on which a successful registration law can be constructed, and, second, in drafting such laws for adoption in various states. The first was issued in a circular prepared by the Committee on Demography of this Association, and the Census Bureau, in which eight principles were laid down that experience has proved necessary for a successful registration law for deaths. We said nothing about births because we did not propose to go further than actual experience warranted us in doing. As I have said, we laid down these principles and the last one of the eight was that penalties should be provided under the law. As a member of the proposed section on vital statistics, I have resubmitted these principles to that section and through the section to the Association for reaffirmation, and I have added to the last section, so that it reads thus: "Penalties should be provided *and enforced*." It is the key to the whole situation. I have also submitted a series of eight principles on the same general lines and with the same enabling provision, for the registration of births. In regard to the draft of laws relating to the registration of deaths and births permit me to mention a single instance where the principle of the law was adopted, almost without change except [illegible] particulars as the registration law passed by the [illegible] Legislature in 1908, which was the most complete success for the first year of operation of any registration law that has ever been put on the statute books.

We [illegible] working along this line, and with the [illegible] Laws and the American [illegible] this year we are going over these [illegible] laws and are endeavoring to present them, if possible, in [illegible] to reaffirm them next year [illegible] together with copies [illegible] in the laws now [illegible] states over with laws. Every [illegible] registration laws some of them [illegible] unless the laws are en- [illegible] to motives of physicians [illegible] with the law. It was

do not put them in jail when they violate it* — you are going to have worthless registration. Even that map (referring to map on wall showing registration states), after fifty years of effort, is not based on a *complete* registration of deaths. It is about ninety per cent. Somebody asked me if they had ninety per cent. of accuracy in registration in Germany and France. I replied, "No; they have one hundred per cent. of births and deaths returned. All births and deaths are registered in those countries."

In conclusion, I desire to present the following resolution:

Resolved, That the American Public Health Association extends its cordial congratulation to the Commonwealth Bureau of Census and Statistics, and to the Statistical Conference of Australasia, upon the adoption of the International Classification of Causes of Death, and welcomes the possibility of more satisfactory comparison of data for Australasia and America made possible thereby.

The resolution was seconded, and referred to the Executive Committee without discussion.

(Was amended by Dr. Wilbur at request of Executive Committee.)

Dr. Hibbert W. Hill, of Minneapolis, Minnesota, read a paper entitled, "Sources of Error in the Laboratory Diagnosis of Diphtheria." (See page 39.)

DISCUSSION.

Dr. John N. Hurty: I want to ask Dr. Hill if he does not consider it possible that a non-virulent bacillus in one throat may be virulent in another. We go into a school and we find two or three cases of virulent diphtheria come out of there, and if we take a culture from every throat in the room we are certain to find other children with diphtheria bacilli in their throats, and yet they are making a good defense against the disease, or the bacilli themselves are non-virulent, and I would like to know if these non-virulent bacilli transferred to another child could become virulent? We have been acting on the assumption that they could, and I am sure some effective work has been done in consequence. The finding of diphtheria bacilli is a bad sign. I think it is time to take action when they are found. If we visit a family where diphtheria bacilli exist, we proceed as for undoubted clinical diphtheria. We use the sovereign remedy — antitoxin, not only on the patient, but on the other children that are in

* Of course only for willful or repeated violation of the law and after milder means have failed.

the household, giving their immunizing doses. It has seemed to me that antitoxin was a good thing to use liberally whenever diphtheria existed and I feel quite certain in several instances in our state we have controlled epidemics of the disease. In one county I rode two or three miles and in that time visited sixteen families and found two cases of diphtheria. [illegible] the road was unmuzzled and that was the end of the matter. If we had not acted upon the assumption that it was possible [illegible] other children would have developed the disease. I do not inquire as to whether the children were infected with virulent or non-virulent diphtheria bacilli. That is [illegible]

Dr. Wm. C. Woodward, Washington, D. C.: I would like to ask a question as to the line of demarcation, possibly, between medical and sanitary control. We have had diphtheria for a year or two and the question arises in the District as to the exact [illegible] in which the diphtheria bacilli were found. [illegible] clinical symptoms of diphtheria whatsoever and a wise corporation counsel decided that it was found diphtheria [illegible] in a man's throat. It is now the duty of the health [illegible] to enforce the provisions of the law and that a man who had diphtheria was a danger to the community and [illegible] Where the question is left in the air [illegible] has had the [illegible] We have been working [illegible] cases of [illegible] Where [illegible] the man [illegible] the use of the [illegible] Many [illegible] fever and employes the [illegible] the presence of the [illegible] and the [illegible]

[illegible] the right [illegible] with [illegible] will [illegible] be accepted by [illegible] increased with the [illegible] was in [illegible] what [illegible]

legal diphtheria, and yet I question if in a court of law one could prove legal diphtheria by finding the bacillus in accordance with our present bacteriological methods in the throat or nose cultures. The present bacteriological methods are snap shot, are not satisfactory to clinicians, and certainly are not entirely satisfactory to the bacteriologists themselves. The great trouble is that so many organisms are met with which closely resemble the diphtheria bacillus. I think those who deal largely with bacteriology at the present time agree that a negative test of virulence with a culture that has been injected into a guinea pig is the only test which will exclude some of the forms of diphtheroid organisms, and the simple presence of an organism pronounced by the bacteriologist from his routine culture methods, such as are used in public health work, is not sufficient evidence. A positive report that such an organism as the diphtheria bacillus is present, would certainly not be accepted in a court of law, if some men questioned whether it was a virulent organism, or the true diphtheria bacillus. If its virulence had been tested and it killed a guinea pig with typical lesions, it would be accepted. I think the time is near at hand when in public health work and in large municipal laboratories suitable arrangements must be made for a more elaborate study of the diphtheria bacillus, and when there is absence of clinical symptoms, or when a culture for release remains positive for an abnormally long time, the test of virulence will be the thing to determine whether or not the patient shall be released.

Dr. Charles V. Chapin, of Providence, R. I.: I think Dr. Hill's contention is undoubtedly correct, that the word "diphtheria" should be confined to a description of a pathological state due to the toxines produced by the diphtheria bacillus. Diphtheria is the name of a disease; not of a person infected with the germs of disease. That is the common sense meaning, and I would say that in Providence we had the temerity to take the question into court. I undertook to restrain a boy who had diphtheria bacilli in his throat, but who was not sick, and the court decided that he did not have diphtheria.

I think Dr. Hill did well to emphasize this distinction, and as health officers we must recognize it fully in the future. Disease is one thing, but infection with disease germs is another. I feel very sure that the courts generally will interpret the term disease as applying merely to a pathological condition of the human body. They will not apply the term to a condition in which we simply have the organisms which may cause disease.

That brings us to another point which I feel as health officers we have not been ready to recognize. There are a great many people

who are infected with the germs of disease and who are not sick. They may, for instance, have diphtheria bacilli present in their throats and noses, but for some reason or another they are not really sick. I am very much afraid that we will have to make a distinction in our treatment of the persons who are sick, and of those who are simply infected.

DR. J. J. KINYOUN, Washington, D. C.: Academically, I agree entirely with Dr. Hill's contention regarding the laboratory examination of diphtheria, but from a public health standpoint, I do not. A great many health officers, and in fact, the majority of physicians, place too much stress upon positive tests or preliminary cultures in these cases. I think that just so soon as we attach less importance to preliminary tests and more importance to the discharge tests, the better it will be for patients. In other words, the free use of antitoxin will cure more cases of diphtheria and render less difficult the office of the health officer.

With regard to the legal opinion as to what constitutes diphtheria, it appears that Dr. Chapin's court has decided that a person has not diphtheria unless he is suffering clinically from the disease, yet from a public health standpoint, I am sure that the judge has made a wrong decision, because in that case we will have to abandon practically all quarantine measures.

There was a law passed in California which, with slight modifications, might be applicable to these cases of so-called non-clinical diphtheria. I had something to do with that law. In fact, I was responsible for it. I was requested by the surgeon-general to send some cultures of typhoid, diphtheria, plague to Washington, which I did. The governor immediately hearing of it, requested me to pass a law to prevent any person from sending cultures of the germs of disease, as they, cultures of cholera, [illegible] would be most effective as the California law [illegible]. In other words, a person may have diphtheria or virulent diphtheria, just as virulent as a true case, but be well and not sick and liable to [illegible] a true case, but under which we would [illegible].

[illegible] Dr. Hill's paper was Dr. Kinyoun with regard to [illegible] bacilli [illegible]. While it is true the majority of instances where the [illegible] health officers [illegible] diphtheria's prevention [illegible] I do know [illegible] that where the ba[illegible] in the family the members of the same

family and others contract the disease from the non-virulent forms. I think we had better be very careful in saying whether a diphtheria bacillus is virulent or non-virulent from animal inoculation.

Some experiments have been made in the New York laboratory of several strains of non-virulent cultures, which show that when they were put under proper conditions they would all develop a toxine, and there is not much difference in the strength of the toxine. That being the case, and diphtheria being due to a toxine, we should be careful in determining by animal inoculations whether or not a bacillus is virulent or non-virulent.

I think, as a rule, we should regard it, as health officers, wherever we find the diphtheria bacillus, as our duty to treat that case as diphtheria, for fear of the spread of the disease to others.

DR. WILLIAM BAILEY, of Louisville, Ky.: I do not appreciate fully the close discrimination that is being made between legal and non-legal diphtheria. It is my judgment that, whatever may be the judgment of the court, any child that has the bacillus of diphtheria in its throat ought to be put under control. At least, I would not like a child of mine to mingle with that child, and even if it can be decided technically that in an individual case the bacillus is non-virulent, we know that it may become virulent. It occurs to me, therefore, on the same principle we might take a rag or cloth that has come in contact with a smallpox patient into court, and while the court would not decide that the rag had smallpox and could not be convicted, yet I think it is wise to take care of the rag the same as I would a child that has the bacillus of diphtheria in its throat. (Laughter and applause.)

DR. CHARLES A. HODGETTS, of Toronto, Ontario: There is a difference between what we may call laboratory diphtheria and clinical diphtheria, consequently a greater responsibility is placed upon the health officer, who has to differentiate between the two in outbreaks of the disease. We leave it to the medical profession in the first instance to differentiate and report cases of diphtheria, but as health officers, when dealing with an outbreak, in a district, more especially among school children, we find upon examination of the throats a large number of children who are carrying the germs of diphtheria and yet do not present the clinical symptoms of the disease.

We have had an instance in Ontario of an industrial school of two hundred and fifty scholars and teachers, in which for two or three years, now and then, there had been true cases of diphtheria which were isolated. Our medical inspector made personal examinations of the pupils and took cultures, and of the two hundred and fifty

pupils over fifty per cent were found to be the carriers or breeders of the diphtheria bacilli. Those thus found were given immunizing doses of antitoxin, of from five hundred to one thousand units, and they were segregated. Examinations were made bi-weekly, and when on a second examination, laboratory tests of swabs were found to be negative, these children were allowed to mix with the others. The school authorities got tired of the slow nature of the work and the children were allowed to mix with one another, hence our work stopped. We expect at any time to hear from that school as having some cases of diphtheria again. Certainly there is a great responsibility resting upon us as health officers, which we should shoulder and deal with such cases when they occur, in a very rigid manner, very similar to those presenting the clinical symptoms of the disease.

Dr. [illegible] Ko[illegible], of Covington, Louisiana: It is [illegible] to [illegible] doubtless due to the writer of the paper just read that he is [illegible] invited to differentiate between the relationship of the official bacteriologist and the clinician, and the relationship between the official bacteriologist and the health officer, whose official person is represented perhaps [illegible] perhaps [illegible] and certainly [illegible] tection.

Dr. [illegible] in the [illegible] the question [illegible] of [illegible] the point of [illegible] We [illegible] afford to [illegible] necessary for us to take [illegible] diphtheria [illegible] taken [illegible] we [illegible] go to present [illegible]

[illegible] always [illegible] and I think [illegible]

that is the general teaching. I am not aware of any reports which show that all diphtheria bacilli are virulent.

As to the medical and legal definitions of diphtheria, we cannot expect courts or judges to decide this question intelligently from a medical standpoint, although they may do it occasionally. I think the trouble with courts or judges is that they do not often get such a pat illustration as was given by Dr. Bailey. I do not see how it is possible for anyone who is not sick, to have diphtheria, whether he has diphtheria bacilli in his throat or not. If we were to call a case diphtheria because the organisms of the disease are present, without clinical symptoms, we might just as well say that if I had a test tube in my pocket containing diphtheria bacilli I had the disease. As an association we ought to see to it that persons who are infected but not sick shall be prevented from spreading the disease, but we should say positively that they have not the disease. The principle has been practiced in Boston for some time. Under the Boston Board of Health regulations isolation, etc., is made to depend on infective, not on the presence of the disease, and that is all they need to prove. They do not have to prove the existence of the disease.

There can be no question as to the free use of antitoxin as recommended. It has been my rule to tell physicians that when they are in doubt as to whether a case is diphtheria or not to use antitoxin first and take a culture afterwards, to see if they should give more antitoxin or not.

Dr. Chapin has answered one or two of the questions that were asked which had a bearing on the opposite side of the question. Someone suggested that a test of virulence should be made in order to decide the question of when to release a diphtheria patient. A test of virulence is, in my opinion, a thing that is legitimate to use in these cases; but it is so time-consuming that we cannot expect to apply it to a large number of cases. It has frequently been our experience that when people get tired of waiting for release, and for a virulence test, long before the final result is obtained from the guinea pig the case is released by negative cultures. In other words, we release them on negative cultures before we get virulence in the guinea pig. Moreover, these virulence tests are not of great practical value in shortening isolation, for the reason that if the patient had diphtheria in the first place, the virulence tests always came positive in animals. I hope that what I have said answers the suggestion of Dr. Kohnke to point out the relationship of this matter to the public. Any dispute with the public or with the courts, depending on the definition of diphtheria

of the relation of bacterial findings to the presence or absence of the [illegible] can readily be settled by the health officer. He can make the determinations, he can publish them widely; he can incorporate them into his rules in a definite way and then see to it that they are rigidly enforced.

On motion, the three other papers on the program were postponed until Wednesday morning and made the first order.

On motion the Association then adjourned until 3 P. M.

FIRST DAY—AFTERNOON SESSION

The meeting was held in conjunction with the New Jersey Sanitary Association.

A symposium on "Ideal Milk of the Future" was held.

Professor R. A. Pearson of Ithaca, New York, and Professor F. [illegible] of New Brunswick, New Jersey, read papers on "Ideal Dairy and Transportation." Dr. Thomas Darlington of New York read a paper entitled "Municipal Control of Milk." Dr. C. E. [illegible] of Washington, D. C., read a paper entitled, "Ideal Milk—National [illegible] Association." Dr. [illegible] discussed Sanitary, and [illegible].

[illegible] Dr. Davis [illegible] of Syracuse, New York, Dr. [illegible] of Montclair, New Jersey, [illegible] Mass.

[illegible] 8 P. M.

SECOND DAY—FIRST SESSION

The meeting was held at St. Paul's M. E. Church and was called to order at 9 A. M. by the President.

Prayer was offered by Rev. [illegible], pastor of St. Paul's [illegible].

[illegible] Hon. F. P. Stockwell, mayor of [illegible], and the President, Dr. Dorman, [illegible] annual address. (See page [illegible].)

[illegible] Dr. Richard H. Lewis, seconded by Dr. Peter H. [illegible], a resolution was passed by the Association thanking the President for his address [illegible] progress in his own country.

[illegible] Association then adjourned until Wednesday, 10 [illegible].

WEDNESDAY, OCTOBER 2, 1907.

SECOND DAY — MORNING SESSION.

The Association met at 10 A. M. and was called to order by the President.

The Secretary, in the absence of Dr. Guion, made some announcements in behalf of the Committee on Arrangements.

THE PRESIDENT: We will now listen to the report of the Executive Committee by the Secretary.

The Secretary called the roll of the Advisory Council, and vacancies were filled by the President.

Dr. A. G. Young, Secretary of the Maine State Board of Health, then read a paper entitled, "Control of So-called Minor Infectious Diseases." (See paper page 50.)

Dr. Alfonso Pruneda, of Mexico City, followed with a paper entitled, "Means of Controlling the So-called Minor Infectious Diseases." (See page 53.)

DISCUSSION.

DR. GARDNER T. SWARTS, of Providence, Rhode Island: I think that as executive health officers we should be grateful to the Program Committee for having brought this topic before us for consideration and discussion. There is nothing more annoying than a lack of control or inability to control these minor infectious diseases. Many physicians say that while these diseases are contagious, they are not fatal to life; that they do not cause much systemic disturbance; that children do not suffer much from them. That this is not altogether true, has been pointed out by Dr. Young in his excellent paper. This paper has impressed us with the fact that the mortality attending some of these minor infectious diseases is not a small matter. It is something that we should carefully consider. We have fairly good control of such diseases as scarlet fever and diphtheria, but not enough attention has been given to these minor infectious diseases in the past to show what can be accomplished. They should receive more attention from us than they have. When we hear of a case of measles or whooping cough in school, the general impression is that the whole school of children will contract the disease; that they cannot help doing so. We used to say the same thing a few years ago with regard to scarlet fever and diphtheria. We cannot impress upon the public too strongly the importance of controlling the minor infectious diseases, and as long as these diseases are treated with indifference

by us and the people themselves, so long will they continue to spread contagion. We have clearly shown that scarlet fever and diphtheria are communicable diseases, and that these diseases are consequently preventable, and if we use our knowledge of other communicable diseases and methods of analysis, of control, we can prevent them. Even if we cannot wholly prevent them, we can check them in a measure. The sooner we impress upon the school authorities and teachers that these diseases are dangerous to the public health, and have ordinances and laws to that effect, the better it will be for us. In cases of diphtheria or scarlet fever, we placard houses, we isolate the patients, we quarantine them; but with the minor infectious diseases we make no mention of these things whatever. Teachers and the public generally have been led to believe that they are unimportant diseases. Are we right or wrong in this matter? I do not think so. I believe an effort should be made by us to check them. I am sure we are not educating the teachers and the mothers with the sufferers, the children, and the public generally, that there is not only some mortality connected with these diseases such as whooping cough, measles, etc., but that the sequelæ they leave behind. It seems to me that [illegible] sanitarians and health officers to make some move in these matters. We may not be able to stamp out measles or whooping cough or spread. It is of short incubation, but if we can stop fifty per cent of the cases from developing, it is worth while to do so. I believe measures should be taken in that direction. It is the local health officers, the active men engaged in this work from whom we expect results.

[illegible] of Covington, Louisiana. The importance of the [illegible] infectious diseases depends, it seems to me, upon the [illegible] element, and climatic conditions. In one part of the [illegible] disease may be important which in another part of the world [illegible] insignificant. I believe that each locality should be [illegible] the importance of any particular disease and adopt [illegible] to control it. If we take the mortality of disease as a [illegible] importance of the application of preventive measures, we [illegible] the astounding fact seemingly, that yellow fever [illegible] as compared with whooping cough [illegible] but mortality sta[illegible] yellow fever when it appears is m[illegible] the application of preventive meas[illegible] Mayor of Canada. It is important [illegible] of our towns. So with scarlatina measles

and whooping cough. In a cold climate the sequelae of scarlatina are mainly diseases of the kidney, which become important. In a warm, dry climate, scarlatina is not an important disease on this account. In a damp climate and a cold one, the sequelae of measles, lung affections, become of importance. So that measles in Maine, the mortality statistics of which are under consideration, or were considered by Dr. Young, as important; while in a warm, dry country, like many parts of the south, the disease is of lesser importance and is practically insignificant as compared with other diseases not important in cold countries. I believe that this Association cannot lay down a set of rules which should be observed by every health officer in every part of the countries that comprise this Association by representation. We should consider that point of view before deciding upon any radical measures. The majority of the members in this Association are accustomed to regard diseases from a northern point of view, from the point of view of a severe winter, and of course greater danger; but the southern membership of this Association must realize that a disease which is important in the north may be practically insignificant in the south; and general rules only, and elastic rules, should be adopted, and recommendations if made, should be modified according to environment, locality, and climatic conditions.

Dr. Young (closing the discussion): In my paper I spoke of the educative influences of local boards of health as being of great importance in teaching the public with regard to these so-called minor infectious diseases. In Maine we have one provision of the law which empowers the teachers of public schools to dismiss classes whenever they find a child or children in the schoolroom who have come from families in which there is an infectious disease, such as scarlatina, or diphtheria, prevailing, and they are required to report the fact immediately to the health officers and to the school officers, stating that the school or schools have been dismissed. Then the local board of health disinfects the school forthwith. The school may be opened again in a short time, possibly within the next two or three days, as ordinarily it is easier to disinfect a schoolroom than it is a house.

Messrs. Robert Spurr Weston and Ralph C. Tarbett, of Boston, Massachusetts, read a joint paper entitled, "Typhoid Fever at Knoxville, Tennessee, and its Relation to the Water Supply." (See paper, page 63.)

DISCUSSION.

Dr. Quitman Kohnke, of Covington, Louisiana: Typhoid fever unlike the minor infectious diseases considered a while ago, demands

for its regulation rules that are universal. Its period of incubation is so long that it can be carried to any part of this country from another. Our experience in New Orleans bears out the opinion that typhoid fever there is in at least ninety per cent of the cases brought from other places, notably summer resorts. The average maximum period of incubation is twenty days, and an infected patient may go from the place of infection to any part of the country and there cause infection by insect transmission and otherwise. For this reason, typhoid fever should be considered important wherever it occurs, and it would be quite competent in my opinion for this Association to issue its recommendations based upon these facts.

Dr. John V. MacDonald, of Brandon, Manitoba. Speaking of flies and typhoid fever, I wish to draw attention to a thing that occurred in the country I came from. I have lived there upwards of twenty-four years and have never known of as little typhoid fever as we have had this year. Now, it is hardly possible that the water supply has improved so much as to do away with the prevalence of typhoid fever in that country. Typhoid fever has been prevalent there for twenty-four years every fall. Sometimes it would come on in August, and run its course in the form of an epidemic for two or three months. But one thing that is noteworthy is the absolute absence of flies. There were scarcely any flies to be seen there until about five or six weeks ago, and it is a curious coincidence, if it may be termed a coincidence, that typhoid fever was almost absolutely absent until the flies began to make their appearance again. During the greater part of the summer very few flies were seen anywhere in my town, and it seems to me that this is a valuable observation in connection with the possible dissemination of typhoid fever by flies.

Dr. Edward V. Hess, of Lorain, Ohio. I would like to ask the reader of the paper what coagulant is used in their filtration plant?

Dr. Whipple. Ferric sulphate or aluminum was used.

Dr. Hess. I have a few figures from the city of Lorain, one of the first cities to adopt the mechanical filtration method of dealing with water. I will not read these figures, but simply give you the results.

For several years Lorain had no sewer system, that was, prior to 1895. During these years for which we have statistics, the death rate from typhoid fever was about forty-four per hundred thousand population. The population of Lorain is about thirty-five thousand. Between 1895 and 1899 the water was polluted by sewage. Lorain obtains its water supply from Lake Erie about one-quarter of a mile from the point at which the main public sewer empties. The death rate during the years from 1895 to 1899 inclusive was 111.5 per

100,000 on the estimate of the population. It was early in 1897 that the mechanical filtration plant was put into operation, and it was in successful operation until 1903, when it was deemed to be inadequate for the population. I have the figures here from 1897 to 1906 inclusive. The death rate from typhoid fever with filtered water, including the years in which the filtration plant was inefficient, was 16.5 per one hundred thousand, as compared with 111.5. During the past two years, however, that is, 1906 and 1907, so far the death rate has reached 54 per one hundred thousand. During these years the city has been building a new plant with a capacity of six million gallons per day. This plant has not thus far been successfully operated There have been defects or difficulties connected with the mechanical arrangement. I also have figures here which show the relative efficiency of alum as a coagulant and the sulphate of iron which has been in use at Lorain lately. From 1897 to 1903 alum was used, and the death rate during those years was 15.6. From 1904 to 1907 iron has been used, and the death rate is about 35 per 100,000. I believe that shows pretty conclusively that the sulphate of alumina is better than the sulphate of iron as a coagulant.

DR. HILL: I would like to ask what the coli efficient of the filters was during the fluctuations that have been spoken of?

DR. HUG: I cannot say anything definitely on that point, but I would like to remark that up to 1903, we had a competent bacteriologist in charge of the plant at Lorain and the coli efficient was all right. It was seldom that the colon bacillus was found. Since then, however, the only bacteriologist we have had, has been a gentleman who is working in the interest of a corporation. He is not working for the city of Lorain, but the colon bacillus has been found on the occasions on which the State Board of Health made examinations. The city at present has not a bacteriologist of its own. I am not a bacteriologist myself, so that I cannot speak definitely in regard to the point made by Dr Hill, and the city does not furnish me with one. But judging from the number of typhoid fever cases we are having, I think the colon bacillus as well as the bacillus typhosus must be present.

DR. HIBBERT W. HILL, of Minneapolis, Minnesota: I should like to comment on the fact that filtration as a solution of the problem of water supplies has one tremendous drawback. Water can unquestionably be properly filtered. A filter, entirely capable of doing proper work, can be installed, b the qu ion then inevitably comes, "Will it be put in charge o ll see that it is properly attended to?"] : "No." It is not as simple a prob the time these filtra-

tion plants are managed in such a way that they do not filter water properly, and that question of inefficient management is one of the great problems we have to contend with in considering filtration for public water supplies in the Northwest—indeed, anywhere in this country, for that matter.

I want to ask those gentlemen who have had experience in Northern regions whether they have seen outbreaks of typhoid fever beginning shortly after the freezing over of a river water supply and terminating when the ice broke up. I know in the Red River Valley, with a population of about 10,000 people, ten percent of the inhabitants of that town had typhoid fever within three months one winter recently due to a polluted river supply. The epidemic began when the river became frozen over, but ceased when the river thawed out again. I would like to know whether that has been the experience of others or not.

Dr. H. [illegible] Albany, New York: I can corroborate what Dr. [illegible] said with reference to winter epidemics of typhoid fever [illegible] polluted water supplies. If it were desirable and [illegible] I could give the details of five or six epidemics of typhoid fever that have occurred, some in small places and some in large cities, which have followed the course that has been mentioned. In some of these instances examinations of the water supplies causing these epidemics [illegible] apparently less pollution in the winter than [illegible] During the summer, these places would [illegible] These are factors in the situation [illegible] thoroughly worked out. I think in a few years [illegible] present satisfactory evidence as to the [illegible]

Mr. W[illegible]: Closing the discussion. The discussion which has [illegible] interesting. I was about to mention the [illegible] from the ideal. Many have per[illegible] that the water supply is the cause [illegible] and that [illegible] responsible for the other [illegible] We have been able to gather [illegible] and something [illegible] for an explanation of the [illegible]

[illegible] the water [illegible] instituted [illegible] They should be

in competent hands. I do not mean only that a man should inspect the plant occasionally, take samples of water and report upon the efficiency of the plant, but that a competent man should be on hand each day to see that the plant works efficiently.

It is well that Dr. MacDonald has brought up the subject of winter typhoid. Many will remember that the typhoid fever in London is a winter disease. The high point in the curve comes during December and January when the old open filters fail to do their work efficiently on account of ice, while in other cities in England where there are better water supplies or more efficient filters, the high point in the typhoid fever curve occurs in September.

With reference to the remarks by Dr. Hug on coagulants for water filters, I would say that I do not think that it makes very much difference what coagulant is used if it is used properly and is adapted to the particular water in question. Good results can be obtained with several kinds of coagulants that may be used with more than one kind of filter and purification plant. Sulphate of alumina seems to act very well in many cases, but only where the water is alkaline and not too clear. Lime and ferrous sulphate is a very efficient combination in the central west, but has not yet been proved to be satisfactory on the South Atlantic seaboard. To some waters the addition of suspended clay assists the coagulation and magnesium hydrate, formed during the softening process, is also a good coagulant as was shown during the Columbus experiments.

Professor R. A. Pearson, of Cornell University, read a paper on "Judging the Sanitary Condition of Dairies With the Aid of a Dairy Score Card." (See paper, page 179.)

Professor H. L. Russell of University of Wisconsin, spoke on "Leucocytes in Milk." (See page 174.)

DISCUSSION.

DR. WILLIAM R. STOKES, of Baltimore, Maryland: I was very glad to hear Professor Russell speak concerning this matter of leucocytes in milk, and I must say that in the main, I thoroughly agree with him.

Some years ago in co-operating with a professional friend of mine, we found a remarkable condition on one of the farms near Baltimore in a herd suffering from what we call garget.

Of some eighty animals the disease was transferred from one to another and the entire herd became dry. The udders of the cows were full of pus and the pus contained streptococci. We began to make examinations of the milk from the individual cows, and we found by a method, which has since been improved, that some of the cows had on

an average one pus cell in ten fields. In other animals there were one hundred and fifty pus cells in one field. We found streptococci and inflammatory conditions, so that we proposed at that time that it would be a good thing to make routine examinations of the milk from individual cows. Others began the same work and, as Professor Russell has said, different methods have been proposed for the purpose of examining milk from many cows. If one cow suffers from an inflammatory condition of the udder and the milk is mixed with that from one hundred different cows, it will produce less pus cells in the mixed milk than it must with the milk of nine other cows. If we use this method to great advantage, the examinations should be made of milk from individual cows on the dairy farm. I think it may be of some use in examining the mixed milk, if we get, as we do sometimes, large quantities of pus cells and streptococci in the sediment in mixed milk from many cows. If we find this condition it will call our attention to that special herd, and in such cases, we will find some of the animals suffering from similar unseen conditions of the udder.

[illegible] Professor Russell has hit the nail on the head and I would like to say I think it is a good plan to use either Wright's or Jenner's blood stain. Wright's or Jenner's blood stain will enable us to differentiate [illegible] the polymorphonuclear leucocytes [illegible] lymphocytes and epithelial cells. When we [illegible] pus cells from the others present in the milk [illegible] staining a pus sediment to use Wright's or Jenner's blood stain and in this way we are reasonably sure [illegible] to produce an inflammatory [illegible]

[illegible] Dr. Leon. The writer of the paper [illegible] and I [illegible] he has said. The question of [illegible] count of a laboratory [illegible] with [illegible] Russell has just mentioned [illegible] the laboratory ex[illegible] at that time was [illegible] individual examinations [illegible] and in eleven [illegible] At that time I was [illegible] the matter [illegible] the dairy and put [illegible] was only one cow out of the eleven [illegible] its veterinary surgeon could

discover. His careful examination failed to disclose any disease in ten out of eleven cows. Of course, with a diseased udder it was easy to understand where the pus came from, but in the other ten cows we could not find a cause for it. Careful examination made at that time, also before and since then, as to the surroundings, the hygienic condition of the dairy, the food, and other conditions did not disclose anything in particular, and the only difference between that dairy and other dairies was this: This man was feeding his cows a much larger proportion of cotton seed meal than any other dairy. Cotton seed meal, as you know, is a very nutritious diet. These ten cows were excluded, and the one with a diseased udder was disposed of. In these ten cows the diet was changed and they were put on pasture and food of a different kind entirely, and slowly the pus disappeared from the milk. Some of them had pus in the milk so long that we became doubtful as to what effect the diet had on it.

Professor Russell has said that this worked a great hardship on the dairymen of Memphis. It is true, we had considerable trouble when the law was first enforced, but a competent bacteriologist was hired by the dairymen to check with our bacteriologist and we always won out in the courts.

So far as the score card is concerned, I am a great advocate of it, although we have not adopted it yet. The reason we have not adopted it is because we have thought the police court was the best score card we could get. If the recorder should fine a dairyman two or three times in succession, it would ruin his business, because in cities of our size everybody reads the newspapers, and when a dairyman is find two or three times he either goes out of business or changes the name of his dairy. And some of them have been forced out of business. The bacteriologist is the man that makes up the score card after all.

I would like to ask Professor Russell if he has any opinion with regard to diet influencing or producing pus in the milk. Our bacteriologist investigated that subject and found out very little about it. He was at a loss for a long time to know where the pus came from; but it was found that when the diet of these cows was changed the pus gradually disappeared.

DR. ERNEST C. LEVY, of Richmond, Virginia: I cannot agree with the last speaker (Dr. Jones) that mere punishment of the men who sell bad milk can ever take the place of the score card. These are two very distinct things.

DR. JONES: I had reference to a small city.

DR. LEVY: I am from a comparatively small city — Richmond. We must realize that the most a laboratory can do is to enable us to keep

watch over a large number of dairies, but, at the very best, it can do no more than could be accomplished if we could employ an unlimited number of inspectors, including veterinarians, to watch the milk at every stage from the cow to the time it is offered for sale. A high bacterial count tells us that something is wrong, but it does not tell us whether the fault lies in dirty methods or in failure to cool the milk promptly and keep it cool. If a man is fined simply for having a high bacterial count, or for selling milk below standards of any kind, you may succeed in driving him out of business, but an intelligent inspector can show him where the fault lies and help him to correct it and stay in business.

In Richmond the work of sanitary improvement of the milk supply has been going on only since May first. The score card of the Dairy Division of the United States Department of Agriculture was adopted from the start with the single modification of having a margin reserved for bacteria, which I regard as an important addition. We also have an index card for each dairyman, on which a number of his scores are entered, each with an index figure corresponding to the number of each score. This index card enables us to see immediately how each man has been running in his scores for some time, and, if details are desired, the serial number enables us to turn at once to his full score.

I cannot too strongly recommend the score card to those who have not yet tried it. It keeps before the inspector at all times an idea of all the points to be looked into at every dairy farm, and by attaching a numerical value to each point, it enables him to make quite accurate comparisons between the various places which he visits and also between conditions found at the same place at different times. He can not do this without a score card since even if he could carry in his mind, from one visit to the next, a perfect picture of each place still, many of them will be found to have improved in some respects while they have gone back in others.

When this work was started in Richmond, five months ago, the conditions of many of the dairy farms was very bad indeed. The average score was less than forty per cent. We had seventeen that scored under thirty per cent, and many of these were under twenty. One man as low as thirteen. We revoked seventeen permits on the second visit, a pretty high proportion out of a total of ninety seven places sending milk into the city. We have now eighty six in business, six new ones having come in, and their average score now is to two per cent. One man who scored only twenty on May first now scores over two and a half, and others have improved to an almost

equal degree. To state the improvement somewhat differently, on the first of May fifty-four out of ninety-seven dairies (or 55.6 per cent. of all) scored under forty per cent., while now, after five months' work, only three out of eighty-six who are sending in milk (or 3.5 per cent score under forty. These three must make a better showing next month or go out of business.

We must realize that the entire blame for bad milk must not be laid on the dairy people. Much depends upon how the milk is cared for after it is delivered. For that reason, our health department issued twenty thousand circulars on care of milk in the home and had the milk men distribute these to their customers. They went over the entire city on a single day—Saturday, July the thirteenth. Our three daily papers published this circular in full on the same day and gave excellent editorial comments.

It is not safe to judge of the results of this work after only five months, but at a meeting of the Richmond Academy of Medicine last Tuesday night the matter was brought before the medical profession on account of the fact that the dairymen's association was seeking to have our ordinance amended and made less severe. At this meeting a strong protest was entered against any such change, the doctors unanimously testifying that they had never seen so little illness among infants in our city during any previous summer and that they attributed this largely to the improvement in the milk supply.

A MEMBER: I would like to ask Professor Russell if any examination has been made with regard to a differential leucocyte count, as alluded to by the previous speaker. I think that would be most interesting and would prove of value if we knew. For instance, we have in the human being a leucocytosis, which is very decidedly affected by different outside influences. In human beings who have digestive disturbances, the leucocyte count will run up. The same thing holds good with regard to cows. There may be a disturbance of digestion owing to a cold having been contracted by the cow, and, as Professor Russell has pointed out, a cow in lying on a cement floor may chill its udders, in this way affecting the milk. As these things are noted in human beings particularly in infants, there is no reason why the same influences should not obtain in animals. With these changes we get a decided difference in the leucocyte count in infants, the lymphocytes being largely in excess of the polymorphonuclear cells or pus cells. That applies, in a measure, to young cows. We get a larger proportion of the lymphocytes and polymorphonuclear cells.

DR. HENRY D. HOLTON, of Brattleboro, Vermont: I would like to ask Professor Russell in replying to tell us something with regard to

the presence of streptococci in milk, and what importance he attaches to that. In our laboratory we have made examinations of some hundred specimens of milk from seventy-four cows, and of that number we have found four or five in which there were streptococci in the milk. In one of these cases the milk was mixed. There were three cows, so far as we could learn, that had suffered from garget or inflammation of the udder, so that they were not giving milk from all their teats, showing there was decided trouble.

We have also made a number of examinations with regard to the number of leucocytes found in the blood, and we have found that the leucocytes found in the blood had no relation whatever to the number of leucocytes contained in the milk, showing that the number of leucocytes must be from some local cause rather than from the general condition of the animal. I would like Professor Russell to speak on these points when he closes the discussion.

Dr. WILLIAM C. WOODWARD of Washington, D. C.: We have been using a score card for some time, and our method of using it brings to my mind one feature that has not been spoken of in the course of the discussion, relative to the utility of score cards. It is not enough to score a dairy, but the score must be brought to the attention of the dairyman if we would get the best results. For that reason, our score cards are printed on thin paper and are bound in books, so that the inspector at the time of making his score, which he must do on the farm, makes not only an original copy, which he files with his daily report, but a carbon copy which he leaves with the dairyman. The result is that if the dairyman has any criticism or objection to make as to his score, he can do so then and there. If he fails to do so, he has no right to complain after a week or a month has elapsed, if one of his cows causes trouble to the health department, examines his records and finds that his score is good, he has had ample time to take whatever steps he saw fit that he might make.

I am not in accord, however, with the whole business of scoring. I was impressed very much yesterday by a phrase repeatedly used in Professor Russell's paper. I do not know as he realized how frequently he repeated it. It is the dairyman for whom we are working. And after all, while we are striving to mechanical means such as score cards for improvement in methods and the bacterial count, we must not lose sight of the human element. We must get inspectors who are competent to go to the farms and score them fairly and intelligently, but we must at the same time, keep in touch with the human interests involved and get it so we can secure men who will win the respect and confidence and good feeling of the dairyman. What it seems to me, is

quite as important as the score card; and from a somewhat extended experience I can say this, that it is often difficult to get a good inspector, one who can score intelligently and win the friendship of the dairyman, and when we get hold of such a man he should be treasured as gold. (Applause.)

MR. B. R. RICKARDS, of Boston, Massachusetts: Professor Russell's paper brings out clearly the side of the dairyman, the rights of whom must be thoroughly considered in framing a regulation.

I think every laboratory worker appreciates that our present knowledge of the meaning of leucocytes in milk is yet on an insufficient basis for strict enforcement of a stringent regulation.

But I understood Professor Russell to say that we should have no regulation or limit on the number of leucocytes in milk at the present time. If I understood him rightly, then I can hardly agree with that statement because the city and state *must* have some regulation which will permit them to forbid the sale of milk coming from unhealthy cows. Rather should we not first establish a very liberal limit as to the number of leucocytes found, and then as far as possible have every herd, whose milk shows a large number of leucocytes carefully inspected by a competent veterinary surgeon, weeding out such cows as show lesions.

Dr. Holton asked about pus and streptococci. I would like to say that in practically every instance so far as our experience goes where pus and streptococci are found together in abundance the cow has shown lesions.

PROFESSOR RUSSELL (closing the discussion): I will try to answer the questions that have been asked in consecutive order. First, in regard to the relation which streptococci bear to the leucocyte content. Dr. Stokes said it was not likely that physiological garget would be accompanied by streptococci. In that connection I would say that we have attempted to correlate the relation of streptococci and leucocytes, and we find that there is some degree of parallelism between them. I have under observation at the present time four cows that have had numerous streptococci for four to six weeks past. Their milk is, however, normal. The animals are absolutely healthy so far as any clinical symptoms are concerned, and these animals have been in the herd for years and under close veterinary inspection. Therefore, the history of a cow is worth a good deal more than occasional examinations. I do not think these organisms, however, are pathogenic, but are simply normal residents of the udder gland. The trouble is not contagious in cha[illegible] in it[illegible]es not spread from animal to animal. In th[illegible] veloped this trouble within

a month or six weeks, it has persisted for some time and then disappeared. Wherever we get cases of that sort in which there is a high streptococcus content, where the leucocyte count goes up, the presence of streptococci, while it may be indicative of a slight inflammatory process, so far as our present knowledge goes, it is no indication of a disease process, whether such a condition represents merely a physiological type of garget or not I cannot say.

As to whether diet affects leucocytosis or not, I will say that we have some evidence along that line. We have had half of this herd put on a high protein diet and the other half on a low protein diet. With reference to feeding, we have compared the university herd with what we might call a "scrub herd," and an examination of the milk with reference to the leucocyte content fails to reveal any parallelism between the matter of diet and the presence of leucocytes. Neither is there any parallelism between leucocytes in the blood and leucocytes in the milk. We have accumulated some data on this point. Dr. Holton has told us that according to their examinations in Vermont they have arrived at negative results, and our smaller mass of data along this line is contributory of the results he has given you. I am inclined to believe that the variations which produce a change in the leucocyte content of the blood are not reflected in the leucocyte content of the milk.

As to the position taken with regard to whether we shall formulate a standard or not, it seems to me that at the present time, the best we can do is to take the leucocyte content as an indicator rather than the basis of a standard. I am not in thorough accord with Mr. Rickards as to the advisability of formulating a quantitative standard, because I do not believe we possess data enough to give us a safe scientific foundation, and it is far better to wait until the proper basis for a standard has been determined than to have to take back what we may say later on. The matter of standards has been to back water all along the line.

Dr. Stocker first formulated a certain standard, namely, ten cells to a one twelfth oil immersion field. That has now been increased to twenty five and even to fifty cells per field. It may have served some purpose in the early days to call attention to a given quantitative standard, but it is my impression that while executive health officers are always anxious for information we will have to postpone the matter of a standard until we have accumulated reliable evidence, otherwise we will do an injustice to the dairyman, and bring our own profession into disrepute by formulating a standard on insufficient foundations. If we were asked at the present day as to what constitutes a

definite standard, we would not know whether to put it at five hundred thousand or a million cells per cc. when the variation is so great. We must unify our methods; we must study the animals directly and formulate a quantitative standard which can be interpreted with reason and until that is done, it is futile to put up a laboratory standard and say that above this limit we will reject, and below that limit we will accept. (Applause.)

PROFESSOR PEARSON (closing the discussion): I wish to confirm what Dr. Woodward has said in regard to giving a dairyman his score. It is customary with us to draw an arrow point on the score card, so that one can easily tell whether the score is improving or not from time to time. That gives the dairyman an indication and makes the point prominent, so that we may look for an improvement.

As to good inspectors, I will say that in every state there is an agricultural college, and if that college is not turning out men competent to be good inspectors, then it is not doing what it ought to do. It is up to health officers to go to these colleges and insist that dairy inspectors be trained for the work. That is the place where it ought to be done and where it can be done.

On motion, the Association adjourned until 3 P M.

SECOND DAY — AFTERNOON SESSION.

The Association re-assembled at 3 p. m., and was called to order by the President.

Dr. Joaquin Cosio, of Mexico City read a paper entitled, "Prevention of Tuberculosis in Schools." (See paper, page 105.)

The Secretary read a paper by Professor John Weinzirl, University of Washington, entitled, "The Action of a High, Dry Climate in Tuberculosis." (See paper, page 111.)

Dr. E. Liceaga, of Mexico City, contributed a paper entitled, "Measures Adopted in Mexico Relative to Immigration." (See paper, page page 141.)

Dr. Peter H. Bryce, of Ottawa, Canada, read a paper entitled, "Social Ethics as Influenced by Immigration." (See paper, page 144.)

Dr. Augustin Chacon, of Mexico City, followed with a paper entitled, "Trachoma and Immigration." (See paper, page 163.)

DISCUSSION.

DR. JOSEPH W. SCHERESCHEWSKY, of Baltimore, Md.: Mr. President: As a member of the United States Public Health and Marine Hospital Service, which service, you know, has charge of the medical

inspection of immigrants. I would like to say a few words with reference to immigration in general.

As Dr. Bryce has pointed out, during the last year 1,225,000 aliens [illegible] to this country, and we have been charged with the duty and responsibility of examining these aliens to see whether or not they were suffering from any dangerous contagious disease or from any physical defects of such a character which would affect their health in becoming a living [illegible] of this number, I should say that approximately 13,000 have been rejected for various physical causes. But that only corresponds to about 1¼ percent of the total number. It seems a small proportion, because in all statistics that are available of rejections for [illegible] are made, the number of rejections is much greater than that in relative to a large number because there are certain factors governing conditions here which do not obtain in other circumstances, i. e., the fact that these immigrants have been subjected to a previous [illegible] examination by the steamship companies. There is a fine [illegible] for the importation of certain diseases, such as trachoma, which may escape detection on the other side. The steamship [illegible] at this and other ports are consequently very solicitous [illegible] the physical [illegible] these immigrants. Notwithstanding that every steamship company is supposed to inspect their own immigrants [illegible] they carry, still when they arrive in this country fully one and [illegible] per cent of these immigrants are found [illegible] and [illegible].

[illegible] glad to hear the papers read by the gentlemen from [illegible] have emphasized the necessity of excluding trachoma from that [illegible]. We have found that trachoma is entirely an imported disease. [illegible] originate *de novo* in any place in this country, [illegible] sections of Europe such as Poland, we find that it is [illegible] Cases of trachoma have from thirty to thirty-five percent of [illegible] which may be traced to previous [illegible]. I do not think the question [illegible] is a serious one, as long as [illegible] are to be so rigidly enforced. We have [illegible] in this state. There are very few people of [illegible] who suffer from trachoma. Of [illegible] to different parts of our [illegible]. While there are certain [illegible] trachoma is reported there [illegible] Dr. Bryce has said about immigrants, I will say [illegible] charged materially in the [illegible] are [illegible] class of immigrants today [illegible]

and mentally in this country, as we did years ago. The mental standard is considerably lower. We find on investigation that the steamship companies having invested a large amount of capital for the purpose of carrying on a large business, in order to get adequate returns they find immigrants the most profitable cargo. No article of freight is as profitable to the steamship companies as these immigrants, and therefore, the steamship companies have done everything they possibly could to encourage immigration. This country is represented to immigrants in a very favorable and glorious light. They are ready to believe that this is a country in which money can be picked up in the streets. To be sure the rumors of other immigrants gives some color to that story and they write to their friends at home and tell them the conditions when they come here. The mental status of the immigrant today is different to that which it used to be. In former years to be an immigrant argued a good degree of independence on his part. The modern immigrant regards his own country as a good place in which to live, but of no great economic advantage to the man who earns a mere pittance. In this country, when the immigrant begins to make money his expenses of living are greater, but he manages to save enough money so that in time he can return to his own country to spend it. A certain proportion of them, probably fifty per-cent., who come here manifest a desire not to go back, but to make their permanent home in this country. These become naturalized. If an immigrant of good physique, with no mental stigmata, comes here, and intends to remain, he can be assimilated in the process of time. But I think we are going to be confronted with the problem of how to deal with the inferior numbers who settle here. Those are the ones who are going to marry and have children which will reproduce any inferior characteristics which they may possess, and this is a phase of the subject which I think will have to be considered some time.

DR. CHARLES A. HODGETTS, of Toronto, Ontario: The influx of immigrants raises not only a social, but a sanitary question, and that is the difficulty of housing the foreign population. In our cities and larger towns, in Ontario, in the last few years, with the influx of immigrants, we find these people who come especially from Southern Europe, crowd together, and in coming into Canada and not knowing our laws, they revert very much to the same customs that were in vogue at their European home. We have been somwhat lax as a province and as city health authorities, in enforcing our laws regarding the habitation of these people. In this connection, I might mention one instance that occurred in a city in Ontario not long ago. An Englishman went to a certain place to secure lodgings, and on entering the

house he called in which there was one room in which there were three double beds. He asked the woman, who was a foreigner and spoke imperfect English, where the bed room was and she pointed to a bed in one corner of the room. He asked her, "Who is this bed for?" He found out that one bed was for the husband and wife, another was for three children, and the other bed was the one they had to let.

These are conditions with which we are confronted so far as Ontario is concerned and I feel sure they are common elsewhere. It seems to me very essential that we should try to educate foreign immigrants as to how they should live and what they are expected to do in order to conform with the law. Our local authorities must take the matter in hand if we wish to bring up proper Canadian and American citizens, and by the distribution of health literature printed in their own language begin the work upon their arrival.

DR. G. LEWIS KOHNKE, of Covington, Louisiana. From the point of view of the state of Louisiana, it is very desirable that immigration should be encouraged. Our experience in recent years points to the necessity. I suppose you have not forgotten that there was an epidemic of yellow fever in New Orleans in 1905. That epidemic began on the Italian ships. It remained undetected for weeks until a great number of persons had an immense sum of money had to be spent, with suffering and loss of life. Had those immigrants from Italy, a large number of them from Sicily, and our experience teaches us that Sicilians are worse than Italians of the lowest grade here, been law abiding people of their own country, had they been people of the slightest education our disasters would not have been so great and possibly might have been prevented altogether. My personal experience with the Italian citizens in New Orleans is that it contains a great many criminals who came from the jails of Italy and their presence is a burden to the citizens of Louisiana. Whether the Italian Government encourages this selection or whether the immigrants, the undesirables, come over on their own accord from Italy to the United States I cannot say. But I know that immigration from some of the European countries [illegible] the steamship companies and the governments [illegible] federal legislation on the one hand and on the [illegible] for the proper transportation [illegible] building up a new country but restricted immigration [illegible] states against less valuable [illegible] a new country [illegible] simply on the new country, that new [illegible] and health are additional burden, with the character [illegible] ties represented in the persons of those who

leave it to reach the new one, and in my opinion it is absolutely necessary for the preservation of the morality of the new country that immigration be restricted to moral people and to law abiding citizens of the old countries.

A MEMBER: I would like to say a word or two on this subject. There are a great many immigrants who have come into our new country, Western Canada, but I think that our government is now exercising more rigid supervision and careful inspection of those who are admitted, and my friend, Dr. Bryce, is a strong supporter of this movement. He has had a good deal to do with this supervision and inspection of immigrants. I am sure that our government is anxious to get the right kind of immigrants, but hitherto we have not been strict enough. The lines, however, now, are closely drawn, and there is no doubt that we are getting a higher class of immigrants today than formerly, both from a physical and intellectual point of view. If we do not get five millions of people in twenty years, let us endeavor to get the right kind of people. Let us see to it that we do not get Sicilians of the lowest type, but a class of people which will add to the material good of the population.

DR. CHARLES O. PROBST, of Columbus, Ohio: One of the speakers referred to the education of the immigrant. It seems to me, we might do something to educate immigrants on their arrival, in questions relating to health. I believe the Sons of the American Revolution, a national organization, has done something in this way by handing little circulars to immigrants on their arrival, so that they may become familiar with the customs and institutions of our country. The commissioners of education in the various countries might consider, at least, the propriety of printing in different languages simple instructions to serve as a guide to immigrants, pointing out their new relations, and what is necessary for them to do to protect the health of their families. It is true, a large number of immigrants are unable to read or write, but undoubtedly there are some among them who are, and who could read these instructions to them. That might be the commencement of the education of the immigrant in health matters.

DR. BRYCE (closing the discussion): There are very few questions which have arisen from the reading of my paper. I have been delighted to hear the steps that have been taken by the government of Mexico with regard to the supervision of immigrants coming into that country. The United States has carried on this rigid supervision and inspection for a number of years, and during the last five or six years Canada has done the same.

This subject is such a large one, whether it be in its physical rela-

tions or as regards the moral and intellectual welfare of our peoples, that time does not permit us to discuss these various phases at this time. One thing is certain, however, that of late, after having watched at the seaports and noticing the incoming immigrants, there has been an enormous reduction in number of a certain type of undesirable immigrants coming to Canada, and the same obtains in New York. I take it, on account of the rigid supervision which the United States Government has exercised. Years ago immigrants came to the United States in droves, and unsuspected. Five or six years ago they began to inspect carefully the class of immigrants that were being admitted, and when some of them were rejected or turned back, a large number of them came by way of Canada. But Canada, I am glad to say, has stopped that kind of immigration very thoroughly by forcing inspection on the part of the steamship companies, and this year there has been twenty-five per cent. less immigrants deported than in years gone by. It is our duty to prevent, if possible, undesirable immigrants from coming into our countries. The Immigration Act of Canada is very positive, in that it clearly says, that when any person becomes a criminal, a pauper, or is insane in any municipality, it becomes the duty of the clerk to notify the Department of the Interior of that fact. This department in turn undertakes to deport every undesirable immigrant or person that can be deported, and within the last two years many undesirable people have been deported. This last year there were over one hundred insane persons deported, who were in our asylums before the new law came in force. While we all recognize the difficulties that exist in preventing undesirable people from coming into our several countries, our governments are doing all they can at the present time to deter this influx, because it is the moral quality of individuals, after all, which is going to play the most prominent part in the successful development of the country, so far as immigration is concerned.

Dr. W. C. Woodward of Washington, D. C., Chairman, read the report of the Committee to Investigate and Report upon the Formation of a Section Composed of Municipal Health Officers.

REPORT OF COMMITTEE TO INVESTIGATE AND REPORT UPON THE FORMATION OF A SECTION COMPOSED OF MUNICIPAL HEALTH OFFICERS

Your committee was appointed under a resolution adopted at the last meeting of the Association to investigate the feasibility of organizing a section of municipal health officers, to outline a scheme of work for

such a section, and to report at this meeting of the Association, begs leave to submit the following report:

Your committee believes that the true end and aim of the American Public Health Association is the promotion of the science and art of public hygiene. The scope, however, of such science and art has increased enormously within recent years, and is constantly increasing, so that today not only is sanitary science to be looked upon as a special field of study and the application of that science as a special field of work but within the field of sanitary science, whether viewed as a pure science or as an art, are more limited fields of study and of industry to which many scientific men are confining, and may well confine, their best efforts. The men engaged in such special work profit by attendance at the regular meetings of this Association; such attendance helps to broaden their views with respect to public hygiene and to keep them more closely in touch with their fellow-workers. These specialists, however, as they may be termed, have not asked, and can not reasonably expect, the Association to devote its general meetings to the special discussion of those more refined and technical portions of their work that for their proper comprehension and discussion require knowledge of which the general sanitarian is not ordinarily possessed. This has been recognized already through the organization of the laboratory section and the section on vital statistics. The question now to be determined, therefore, relates not to the inauguration of a new movement but merely to the continuance of a movement already begun.

No body of men is more directly interested in the art of public hygiene than are municipal health officers. No other body of sanitarians comes more closely into touch with the people than do they. For these reasons alone, this Association will do a public service if it brings municipal health officers into its membership, where they will come into contact with the men of four great countries who are actively engaged in the study and application of sanitary science. The general membership of the Association will profit by the ideas and influences which the municipal health officer will bring into it and these officers will in turn be influenced by the scientific atmosphere of the Association as a whole. Moreover, the presence in the Association of a large number of such men will do much to broaden the influence of the Association by bringing it more closely into touch with the people at large.

But in order to bring any considerable number of municipal health officers into the Association it will be necessary to make the work of the Association, and to make its meetings, more attractive and service-

able to them than they have been in the past; otherwise there is no reason for believing that more of them will join the Association and come within its influence in the future than have done so in the past. And in undertaking to determine which of the particular needs and desires of the municipal health officer have not heretofore been met by the American Public Health Association, and which of such needs can be met now by appropriate action, consideration must be given to the fact that, however important a knowledge of sanitary science may be to the health officer, yet his failure or his success as a municipal official does not depend upon an abstract knowledge of sanitary matters or even upon familiarity with test tubes, culture media, and such things, but rather upon ability, through acquaintance with sanitary science and by such agencies and such procedure as is authorized by law, to correct concrete conditions endangering the health of the community which he serves.

For the reasons just stated, it seems to your committee, that this Association should undertake the organization of a section of municipal health officers to which these men can come annually, or oftener if they so elect, to present papers and to discuss problems relative to the practical application of sanitary science through the municipal health department. A section of this kind would necessarily consider the relations to be established between the municipal health department and the general government of the city and its various branches, the best form of organization for a municipal health department, the proper scope of its operations, annual budgets, needed legislation and the way to procure it, the keeping of records, criminal and civil legal action, and so on. All of these are subjects that are of peculiar interest to a municipal health officer, but most of them, it is believed, would call forth but a poor attendance and provoke but little discussion if considered in a general meeting of this body.

The matter of organizing such a section has been submitted by letter to the health officers of ninety-nine of the largest cities and towns in this country, Canada, Mexico, and Cuba. To these letters twenty-seven replies have been received. It may be said that, with a single exception, these are uniformly favorable.

It is recommended, therefore, that a committee of five be appointed by the president to consider such amendments to the constitution of the Association as may be necessary to provide for the establishment of a section of municipal health officers, to prepare by-laws for its government, and to provide a suitable program for its meeting next year, and that said committee be authorized to inform municipal health officers in the communities represented in the Association that at the next

meeting of the Association there will be organized a Section of Municipal Health Officers and to invite and urge their attendance.

Respectfully submitted,

WM. C. WOODWARD,
EUGENE BUEHLER,
WALTER D. GREENE,
Committee.

It was moved and seconded that the report be adopted. Carried.

The President announced that he would appoint the committee of five tomorrow morning.

On motion, the Association then adjourned until 10 A. M., Thursday.

THURSDAY, OCTOBER 3, 1907.

THIRD DAY — MORNING SESSION.

The Association met at 10:10 A. M., and was called to order by the First Vice President, Dr. Quitman Kohnke.

Announcements were made by the Chairman of the Local Committee of Arrangements.

The Vice President then announced the following committee, appointed in conformity with the resolution offered at a previous session, with reference to the establishment of a section composed of municipal health officers: Dr. Samuel H. Durgin, Dr. A. J. Douglas, Dr. M. Iglesias, Dr. E. Buehler, and Dr. William C. Woodward.

THE VICE PRESIDENT: We will now listen to the report of the treasurer, Dr. Frank W. Wright.

Dr. Wright read his report as treasurer, as follows:

FRANK W. WRIGHT, TREASURER, IN ACCOUNT WITH THE AMERICAN PUBLIC HEALTH ASSOCIATION.

RECEIPTS.

1906.		
Dec. 5.	Amount on hand	$962 36
	Dues collected for 1905	75 00
	Dues collected for 1906	2,055 00
	Dues collected for 1907	95 00
	Sale of Transactions	208 30
		$3,395 66

EXPENDITURES.

1906.		
Dec. 31.	By cash paid Fred J. Heer, (Order No. 230)	$200 00
31.	By cash paid Am. Publishing Co., (Order No. 231)	11 25

1907			
Jan	15	By cash paid C O Probst, (Order No 233)	251 50
	15	By cash paid Frank W Wright, (Order No 234)	[illegible]
Feb	4	By cash paid H W Hill, (Order No. 235)	24 41
	25	By cash paid J A Hauff, Agt , (Order No. 236)	15 00
	25	By cash paid Wells Fargo & Co's Ex , (Order No. 237)	4 78
	25	By cash paid Am Express Co , (Order No 238)	1 62
April	24	By cash paid Fred J Heer (Order No 239)	41 75
	24	By cash paid F C McElroy, (Order No 240)	18 75
	24	By cash paid H D Pease, (Order No 241)	66 70
Sept	14	By cash paid C O Probst, (Order No 242)	325 00
	14	By cash paid Journal Infect Diseases, (Order No 243)	511 72
	14	By cash paid Paul Hansen, (Order No 244)	6 08
	14	By cash paid Carleton Keyes, (Order No 245)	5 00
	25	By cash paid Frank W Wright	59 50
		Total expenditures	$1,639 56
	25	Cash on hand	1,746 10
			$3,385 66

OCTOBER 3, 1907

The Auditing Committee which you have appointed have examined the books and vouchers of the Treasurer and find the same to be correct

B. R. RICKARDS *Chairman*
JAMES O. JACKSON.
J. A. EXTON.
Auditing Committee

It was moved and seconded that the report be referred to an Auditing Committee to be appointed by the chair Carried

Vice President Eyerly appointed as Auditing Committee Drs Rickards Jordan and Exton

The Vice President We will now listen to the report of the Committee on Resolutions relating to deceased members of the Association

General A. A. Woodhull of Princeton New Jersey presented a report as Chairman of this committee

RESOLUTIONS ON THE DEATH OF DR FELIX FORMENTO

Resolved That in the recent death in New Orleans, Louisiana, of Dr Felix Formento our beloved President in 1892 this Association has lost one of its most distinguished members, whose active sanitary and surgical work in camp and hospital during time of war, as a member of the State Board of Health of his state, whose valued contribution in time of peace to the sanitary welfare of his people is evidenced

by his long continuance in official position of honor and trust; whose benevolent interest in the unfortunate is marked, by the awarding to him of a medal of distinction by the Italian Government, in grateful appreciation of his important services to the poor of its citizens, included in the Italian colony of New Orleans; and whose example, as a sanitarian, physician and citizen, is an inspiration and a guide to the younger generation.

Resolved, That copies of the appreciation by the Association be sent to the family of Dr. Formento.

RESOLUTIONS ON THE DEATH OF DR. JAMES CARROLL.

Resolved, That this Association recognizes in the death of Major James Carroll, of the medical department of the United States Army, not merely the loss of an intelligent and efficient working bacteriologist from among its members, but the departure from this life of a rare hero who with deliberate courage accepted the very serious risk of demonstrating in his own person that theory of the transmission of yellow fever whose proof has made possible the control, by prevention, of that disease. When Dr. Carroll volunteered to make in this way a vital test of Walter Reed's experimentation and reasoning and thus to assist in establishing its truth, he intelligently accepted a risk greater than that of battle and of far more importance in its consequences to the world than would be the sacrifice of any individual active warrior. He took part in the conflict whose outcome, thanks to his courage and that of his companions, has given the world practical immunity from one of its greatest scourges.

Resolved, That this Association shall present to the War Department of the United States, through the Surgeon General of its Army, this appreciation not only of Major Carroll's heroic conduct, but of the value of his service to the peoples whom the Association represents; and also that it presents to his family its acute sympathy in this bereavement, tempered only by the conviction that his memory will be held in respectful esteem as long as the history of preventive medicine shall be a part of the record of the progress of the race.

DR. FREDERICK MONTIZAMBERT, of Ottawa, Canada: I beg to move that these resolutions be adopted, and as a mark of respect to our deceased colleagues, they be received by a standing vote and in silence.

This motion was seconded by several and carried.

THE VICE PRESIDENT: We will now listen to the report of the committee appointed to select the name of our new Section on Vital Statistics.

DR. HENRY D. HOLTON: The committee met with representatives

from the Laboratory Section and the proposed Section on Vital Statistics and the secretary of the committee will make the report.

DR. J. J. KINYOUN. Your committee recommends that the proposed new section to be known and designated as follows: American Public Health Association, Section on Vital Statistics.

Your committee further recommends that in the event of any new sections being formed, a similar designation be adopted.

THE VICE PRESIDENT. You have heard the report of the committee. What is your pleasure?

DR. HENRY MITCHELL. I move that the report be adopted.

This motion was seconded by several and carried.

THE VICE PRESIDENT. We will now pass to the consideration of proposed amendments to the Constitution. I believe there is a committee report to act on this subject.

THE SECRETARY. The committee that was appointed for this purpose, as I understand it, discharged its duty in presenting a report at the meeting which was held in Mexico last year. This report was accepted by the Association and further consideration of it postponed until this meeting, as it involves amendments to the Constitution and By-Laws. The report has been printed and distributed and copies of the same have been available since the members have come to this meeting.

THE VICE PRESIDENT. A motion is in order that the Secretary read the report in its entirety or by abstract, or let the question be otherwise disposed of. This report, gentlemen, is lengthy. It should be familiar to every one, because it was sent to all of you in time to be read before coming to this meeting.

DR. [illegible] D. SWARTS. If I understood the matter rightly, this report was presented at the meeting in Mexico, was thoroughly threshed out and accepted by the Association and inasmuch as there has been no discussion [illegible] at this meeting so far, I move, sir, that we dispense with the reading of these amendments to the Constitution and By-Laws and that they be adopted according to the requirements of the present Constitution and By-Laws. As I have said as there [illegible] no discussion, I think it is unnecessary reading all these amendments. Is not that so?

DR. HOWARD D. HAINES. What Doctor Swarts has said is true, but I should like an amendment to what he has said as it is a question in my mind whether all of us have sufficiently threshed out this matter and whether it should not be referred to a special committee for further consideration and report next year. There are some

amendments to those already proposed that I think it would be proper to make, if there is any prospect of acting on these proposed changes at this meeting. When we make a change in the fundamental law of an organization, it is a serious matter, especially when the amendments are of such a character as to change very materially the conditions which have existed for nearly half a century. This organization was established in eighteen hundred and seventy-two, and while I recognize the fact, as I think others do, that there are amendments that should be made, the question is whether these amendments cover the ground sufficiently. Although the report is a lengthy one, yet I believe it is not satisfactory in all its wording to meet the conditions, and for this Association at this time to enter upon an attempt to correct some of the defects that seem to be present would be unwise. It is not a matter that we need to be in haste about. More time should be taken in order that the work may be done thoroughly. We have now a good outline of it, and without making any further remarks, I would move that it be referred to a special committee of three for further consideration and report next year. Seconded.

DR. GARDNER T. SWARTS: Having brought out the question of any opposition or objection to these proposed changes which I desired to do I now withdraw the motion I made.

DR. WILLIAM BAILEY, of Louisville, Ky.: There are many things about this Association that I regard very highly because of their age, and one is that this organization has been successful under the present management. One of its characteristics is that, in addition to the elected members of the Executive Committee, each retiring President becomes a member of that body, and I will say to you, that no institution I have ever been connected with shows the same interest that is manifested in this Association which is kept up by the men who have presided over its deliberations. I have seen as many as twelve, yes, fifteen, ex-presidents of the Association in attendance, and they are wholesome in council. For one, I am inclined to go slow, believing that we are doing well. A child is born to us every year, and I hope it will remain as it is.

DR. WILLIAM C. WOODWARD: I would like to speak in furtherance of Dr. Holton's motion. Since I have been here I have considered the present Constitution of the Association in connection with the proposed amendments, and as one of the younger members of the Association, I must say I believe we had better go slow. Having, I believe, given this matter more study than most of the members have given it, it is not altogether clear to me that this change in the Con-

stitution is desirable. I regret that we should take any action which will delay favorable action on any report of the committee. The committee is made up of my friends, and I think of a saying which is attributed to one of our national legislators, namely, What is the Constitution among friends? But the principle will work both ways, and I would like to see action on it deferred. I believe three would be an ample committee, and I move as an amendment to Dr. Holton's motion that the committee be instructed to send to each member of the Association, at least two weeks before the next meeting, a copy of the proposed amendments to the Constitution, a copy of the Constitution as it now stands, with a brief statement of such recommendations for changes as the committee may advise, and a statement of what the effect of the proposed changes will be, so that every member of the Association who comes to the meeting, will have before him in print, form these changes or a statement of what we are going to do. Seconded.

Dr. Holton. I accept the amendment.

[illegible] McSorley, of Ottawa, Canada. As an old member of the Association and one who has its interests closely at heart, I have wish to cast a dissident vote on this subject, a subject [illegible] of the greatest importance. I am heartily in accord with Dr. Holton's amendment. This Association has lived for [illegible] and we trust it will live for many centuries to come. In the [illegible] an Association such as this, a year is as nothing.

[illegible] suggestions I would like to make in connection with [illegible]. First, the committee that has made its report recommends [illegible] moderation of certain definite proposals [illegible] Dr. Mitchell's [illegible] request Mr. President that that committee be [illegible] to take a larger and wider view to take [illegible] consideration and even go outside our [illegible] the consideration of other bodies such as the [illegible] Great Britain [illegible] the British Medical Association [illegible] large societies in France [illegible] study of these [illegible] researches in [illegible].

[illegible] By what [illegible] this Association [illegible] should be

regarded. I would favor, therefore, a committee of three who will work together, that committee to be selected from among the members from the United States. This Association will have ample time to submit views to the committee in writing at the proper time, and to take part in the discussion when the matter is brought before the Association. It is only fitting and courteous on the part of those of us who come from Canada, Mexico and Cuba, that this committee should be drawn exclusively from members of that nation which is the parent of this Association. There ought to be, in my opinion, three men chosen from amongst members residing in the United States, and the more closely these three men can be brought together geographically, the more readily they will work together, and with the less difficulty in the way of correspondence, etc. (Applause.)

DR. WILLIAM C. WOODWARD: I have been reminded that two weeks prior to the meeting is too short a time. I had thought that if we received the reports two weeks before the meeting, the members would take more interest in them. I understand there is a certain time provided for sending out the preliminary announcement of the meeting, and it has occurred to me that it would be well to send out these reports at that time, which, I believe, is not less than one month before the meeting of the Association.

GENERAL A. A. WOODHULL, of Princeton, N. J.: I would offer the suggestion that when this report is sent out, the old constitution, or so much of it as is proposed to be amended, shall be printed, and the amendments printed on the same paper and not given in separate papers. That is a legislative custom. Where amendments are made to a bill in a legislative body, the original bill is printed and the amendments are usually printed in italics, so that one can see the two things at a glance, without having two separate papers in parallel columns, or one below the other, as may be typographically convenient. If the committee in charge will consider that suggestion, I fancy it would be desirable. I simply offer it as a suggestion. I am entirely in accord with the general feeling to defer this matter, and I am speaking now as one of the oldest members of the Association.

MR. R. S. WESTON: I would like to make a suggestion in the form of a motion, if necessary, that the committee in its report shall state the arguments for and against any proposed changes in the constitution.

PROFESSOR FRANKLIN C. ROBINSON: As a member of the committee that submitted this report, I have been much interested in what has been said in reference to it. I feel, as undoubtdly other members of the committee do, that we have done our part, in presenting it. I am

not sure that we evolved the best possible constitution for this Association, but we did the best we could. Much time was given to the preparation of this report. We had a good deal of discussion in the committee, and careful work was done in connection with it. Personally, I have been much interested in seeing how the members look at it. I was impressed with the fact, as a great many others were, that this Association is very old and has been very successful under the old plan; yet, most of us have felt that some changes were needed in the Constitution to comport with its growth and development. I am sure, as a member of the committee, I shall not feel indignant if the report is deferred and worked over again. We were all busy men, but we gave careful consideration to every phase of the report before presenting it to the Association. But in the light of what has been said here, I can see the advantages of having it gone over again and reported back to the Association at another meeting. I do not wonder that many of the members feel that we ought to go slow, for this report is something more than amendments to the Constitution, it is practically a new Constitution, and of course the question arises, won't it be wise to adopt this new Constitution, and then perhaps find in a year or so that some of its provisions need modification. Briefly, I am in favor of having the matter postponed and gone over again carefully by other men who are not connected with the present committee.

Dr. Hulbert, Dr. Dwight of Albany, New York. I think it is unnecessary to say more than to say a few words of the details of the committee's work that many of the suggestions made here were actually carried out in the work of the committee, and in formulating this report. For instance, the question of practically a large medical society in New York and Boston, and other cities, were carefully considered, and the provisions that appear in the report of the committee were taken to meet the Constitutions. As I was the secretary of the committee, I am quite well aware that some of the provisions of other constitutions of extremely successful societies, both those that deal with applied science and those that deal with science in the pure sense, so-called, were incorporated by us in the report.

Regarding the suggestion made by General Woodhull relating to the printing of the Constitution, I will say that in our deliberations we had this in mind, the new Constitution put in legislative form with the amendments in close contact with the original form, but for purposes of economy in printing and because of the difficulty of aligning some of the amendments up with the old portions of the Constitution, and to avoid the creation of undesirable confusion, the old Constitution was not included in the new report. I have it in the minutes as secretary

of the committee. It would not, however, have been difficult to have placed such portions of the old Constitution as were amended directly in contact with those portions that appear in this report.

As Dr. Montizambert has said, the committee was to a certain extent limited by the address which the president of the Association, Dr. Wesbrook, had made, and I think in reading this over it will be seen that the committee was to a certain extent required to deal with certain aspects, and no provision was made for dealing with aspects which were not included in the address of President Wesbrook. Personally, I take exactly the same position as other members of the Association, that the committee should not decide this matter by votes, but by discussion. Nothing would be gained by voting on the details of the proposed amendments until the whole matter has been gone over and carefully considered in all its aspects and compromises have been arrived at. I see no particular reason for changing my opinion at the present time. The members of the committee know that only by concentrating our attention constantly on this report was it possible for us to keep in view all of the objects we had in mind. While I appreciate the great mental ability of the members of this Association, I can thoroughly appreciate also that a few hours' reading of this Constitution would be entirely inadequate to grasp the meaning of all its provisions, and I do not think that a year would be any too long, possibly even two years, before any definite action could be arrived at. But I would bespeak for the committee, the members of which put many hours of the hardest kind of mental labor into this report, that its provisions be most carefully considered, and that those who were on this committee, who put considerable time and thought into it, should receive consideration at the hands of the new committee, and that, if necessary, those members of the old committee who do not or will not appear on the new committee be consulted, because I am sure that a great deal of time will be saved, for I have yet to hear any argument put forth by any member of this Association either for or against this Constitution that was not considered carefully by the committee, and gone over to its minutest details. Therefore, while I agree absolutely with the idea that delay is desirable for further consideration of this matter, and that discussion will be eminently valuable, I would bespeak the most careful consideration of what the committee has here presented.

Dr. John S. Fulton, of Washington, D. C.: It occurs to me that the inclination to postpone this important business is due not to unreadiness on the part of the committee which has the matter in charge, but to the Association's unpreparedness to act, even after

having been informed fully and in ample time by the committee. In this matter to refer the report to another committee for another report next year, I find an unpleasing quality which the Association should consider before taking such a step. I doubt if the significance of this step is quite clear. The members of the present committee have done this work with such care and fidelity as we expected of them. No one has questioned the particulars of their recommendations. They are here to be interrogated, and we have not interrogated them. They know, I dare say, more about all the phases of this subject, than the rest of us combined. Must a new committee now set to work to accumulate all the information which the existing committee has patiently acquired and assimilated in nearly three years past? I hope the Association will pause for a moment's reflection before handing this important business over to an entirely new set of men.

Vice-President KOUNTZE. As I understand it, the committee has made its report, and has been discharged. Their work is complete, and the transmission of the subject matter to a fresh committee cannot be considered any reflection on the work of the old committee; and, as a matter of fact, the old committee, perhaps all of them, will join in a discussion of the subject when it is presented in its present shape; and there are ways of providing for their direct representation on the new committee.

At this point there were cries of Question! Question!

The motion to refer to a committee of three was put and carried.

Dr. WILLIAM C. WOODWARD. I do not think Dr. Pease has in any way exaggerated the volume or character of the labor incident to the consideration of these proposed amendments. It seems to me, therefore, that the Association should tender to that committee a vote of thanks, and I move it.

Dr. HENRY M. PEASE. I desire to second that motion. I realize that the present committee has done a vast amount of work, and I think we may congratulate ourselves that we have received a report from such an able committee.

The SECRETARY. Dr. Pease, who was really the worker of this committee, has had more work than any other member, should be the one to move a vote of thanks, and I would offer that as an amendment to the motion.

Dr. THOMAS MORGAN. As a member of the committee I would like to say that the present secretary, Dr. Pease, retires. He brought the suggestions to the committee [illegible] New York on two or three different

occasions, and spent at least half a day each time in studying the matter presented by him, and it is to him we owe thanks for this great labor.

The motion, as amended, was put and carried.

DR. HERBERT D. PEASE: While manual labor counts for something in the preparation of a report like this, the details of the work were gone over in the committee, and the results are the action of the committee. Every member of the committee put in a large amount of time and thought, and I was merely the medium through which the committee acted. I thank you for your very kind expressions of thanks.

DR HENRY D. HOLTON: If it is in order, I have in my hand two amendments to the constitution of this Association, whether it be the old one or the new one. The first is, it simply adds that the Bureau of Census shall be one of the arms of the national service, which shall be recognized by a delegate in this body; that the Advisory Council shall also have among its members a representative from the Bureau of Census. Of course, these will lie over for one year and can be referred to the new committee for consideration. One amendment is for the old constitution, and one for the new.

DR. PETER H. BRYCE: I would draw attention of the committee to this matter, that the Dominion of Canada might be mentioned for having nomination of membership in connection with this Association. I find that the United States Army and Navy have been included, and incidentally we might include the army and navy of Cuba and Canada; likewise the Census Bureau of Canada.

VICE-PRESIDENT KOHNKE: The chair would suggest that the same argument may apply to every country represented in this Association.

DR. WOODWARD: I would like to mention also the United States Department of Agriculture.

VICE-PRESIDENT KOHNKE: The chair understands that the committee, to which these amendments are referred, has the authority to report in accordance with the discussions thereon at the next meeting.

DR. BRYCE: My idea is that these are directions or suggestions for the future committee to widen the scope of membership under the new constitution which is to be proposed and discussed.

VICE-PRESIDENT KOHNKE: These amendments and suggestions are simply submitted for consideration by the committee, the amendments to lie over.

DR. J. J. KINYOUN: I would request that Dr. Holton include in his proposed amendments to the old and new constitutions not only the Census Bureau of the United States, but the Agricultural Department,

as well as similar bureaus or departments of the governments of Canada, Mexico and Cuba.

Dr. Bryce: I have been reminded by Dr. Pease that it is the intention to amend our present constitution by the introduction of such items or suggestions as may be thought essential, it being necessary to have them put in writing at this meeting, so that they may be adopted as a part of any new constitution on which we may act at the next annual meeting.

Vice President Koons: This whole matter will be submitted to the new committee which will decide what shall be done.

The chair wishes to announce that the new committee will consist of Professor Frank Pierce C. Robinson, Dr. Samuel H. Durgin, and Dr. Hibbert W. Hill. This committee has been selected with regard to thoroughness of consideration of the subject, and somewhat with reference to ease of communication and meeting, and also with regard to representation on the new committee of the old.

Dr. J. Price Lewis of Buffalo, N. Y., read a paper entitled, "The Control of Ophthalmia Neonatorum." (See page 167.)

DISCUSSION ON DR. LEWIS' PAPER

Dr. William Bruce of Louisville, Ky.: Mr. President: It has been my privilege for about thirty years to have control of the children in the various Institutions for the Education of the Blind, and I must confess that this paper is admirable, and one fit for this Association to consider. I have long been convinced that the injury which comes from the gonococcus is more detrimental to the innocent member of the family than is the germ producing syphilis. When we take into account the infection of the innocent wife and the abdominal surgery that she undergoes at and the blind children that are the result, who have not the privilege of Cesarean section, but must come through as nature has ordained, this subject is of more importance to us than this, and how to prevent the disease. If we could begin early and educate boys in regard to the evils of gonorrhea, we would accomplish a great deal; and I think a night school would be a splendid thing if we could interest young men under the ban that would promote male virtue. Gonorrhea is not regarded by men as a disgrace, but as a thing that lasts for two or three weeks. They have no conception of the fact that a disease gonorrhea is likely to produce. [illegible] an innocent wife gonorrheal infection, and [illegible] relations born blind by virtue of it. [illegible] professor who went out and hanged himself. (Applause.)

DR. RICHARD H. LEWIS, of Raleigh, N. C.: As I am an oculist in my private practice, I trust you will pardon me for saying a few words in regard to the admirable paper that has been read. I endorse every word of it not only from the standpoint of an oculist, but also from that of a sanitarian. I have made an attempt to secure the legislation that has been suggested by our General Assembly, but I regret to say I failed ignominiously. We proposed a law regulating midwives, but the Legislature objected, and I did not succeed in getting the desired law. In a country populated as ours is, largely rural, composed of one-third negroes, in addition to a considerable number of ignorant white women, you can readily understand the practical difficulties in the way of carrying out these measures. We all realize that a law, unless public sentiment is behind it, is a dead law. This is an explanation of the fact why so many of these laws are dead letters. We should strive to educate the public in regard to these matters. They need education. The ignorant midwives in our country are largely negroes; consequently the difficulties from a practical point of view are almost insurmountable. However, something should be done, and I shall make another attempt at our next Legislature to see if I cannot secure some legislation.

This paper is a complete, admirable, and convincing one, and I hope it will make the impression that it deserves.

DR JOHN N. HURTY, of Indianapolis: We have listened to a paper of great importance and interest to us, and all can see what responsibility rests upon health officers and upon the medical profession for the existence of this disease. It is a fearful, an awful responsibility the medical profession shoulders. The medical profession and certain societies have been trying to do what they can to control this disease, but they have not done yet one-tenth as much as they can do. All who are interested in this work must work harder and harder. It has been said that typhoid, like sin, is a reproach to any community, and if this form of ophthalmia neonatorum is not a reproach to any community, what is a reproach? I have always been impressed throughout my life with a remark of Benjamin Franklin's in regard to law. We have just heard that unless a community is behind the law we can do nothing, and a community will not be behind the law unless personal interests are involved, and a penalty is imposed. Put on a penalty and people are interested in obedience. We need pronounced laws in regard to this subject that can be enforced. We must have legislation, and beyond that we must have action. It seems to me if we were to put on our birth certificates a question to this effect, Did you use prophylaxis against eye infection? it would be the

means of doing a great deal of good. It would call the attention of physicians to their duty to treat eyes prophylactically, as they should do in the majority of cases.

With reference to a penalty, we have in nearly all the states a labor commission to look after labor, to look after sanitation, the ventilation of factories, etc. What do they do? They inspect these factories, order the proprietors to do so and so and have the courts to enforce the orders. We know if a penalty is imposed on a manufacturer, making him liable in damages for not complying with the rules and regulations regarding sanitation and ventilation, he can be made to comply in a very rapid manner. And it seems to me the medical profession should consent to a law covering the care of the eyes of infants at birth and that in case of ophthalmia neonatorum, if it can be proven that the disease is the result of carelessness on the part of the physician, he should be made liable in damages, and then his personal interests will be considered. I think Dr. Lewis would be willing to [illegible] cases that occurred in his practice and where it [illegible] he would not be willing to be liable [illegible] the result of neglect on his part. The imposition of a penalty would create a great deal of discussion, but such a convention should physician would object to it. Of course it would be hard to prove that ophthalmia neonatorum develops as the result of neglect or ignorance on the part of the physician. The imposition of a penalty, however, would help a great deal. This responsibility which rests upon the medical profession should be considered with very great seriousness.

Dr. Hiram W. Hayes, Minneapolis: I would like to ask Dr. Lewis how many cases of Dr. Lewis would occur weekly, let us say, in [illegible] of foreign people.

Dr. Lewis: It depends largely on locality.

Dr. Hayes: Even on a rough average figure.

Dr. Lewis: Well, the number may be very small. Infection of [illegible] one in fifty or one in two hundred [illegible] active practice may go on for ten years and [illegible]. At the end of the tenth year, however, after [illegible] safe and immune during that length of time, [illegible]. Among the poorer [illegible] and in places where sanitary conditions [illegible] observed these cases are more frequent. The disease [illegible] a large number of physicians consider [illegible] and that there is not a great deal of [illegible]. The aggregate number of blind

children throughout the whole country, as I have demonstrated by the accounts in blind schools, is very large.

THE SECRETARY: As the Association should take some action in reference to this matter, I therefore offer the following resolution:

Resolved, That a committee of three be appointed by this Association to co-operate with American Academy of Ophthalmology and Oto-Laryngology, the American Association of Obstetricians and Gynecologists, and other similar national organizations for the prevention of blindness. (Referred to the Executive Committee.)

DR. WILLIAM C. WOODWARD: There is probably not a state or territory in this country where any legislation is needed to carry into effect the idea advanced by Dr. Hurty. In other words, there is no state or territory in this Union where a physician is not already responsible for the consequence of his ignorance or neglect. A penalty must be enforced by the parent of the child or the next of kin to it. If a case is taken into court and it is clearly shown that the child is made blind by the ignorance of the attending physician, he can be made to pay an appropriate penalty.

DR. C. A. HARPER, of Madison, Wis.: I would like to ask Dr. Lewis if he would advise using the one percent. solution of nitrate of silver in all cases, making it compulsory not only to midwives, but to physicians.

My observation has been with reference to practicing midwives is their lack of knowledge of its use, or there has been objection to it on the part of physicians. In the Wisconsin legislature of 1907 the State Board of Health introduced a bill for the purpose of licensing midwives in that state. The legislature as a body was ready and willing to pass such legislation, but we found serious objection to it coming from members of the medical profession of the state. Members of the State Board of Medical Examiners, I regret to say, as well as many of our prominent physicians in the cities and rural districts, opposed in person and by letter the passage of such a measure. I believe we ought to include in some resolution that is to be drawn up the necessity of emphasizing this not only on the part of physicians, but upon midwives in their respective communities. I believe we should go further and advise that the medical colleges of this country emphasize to students the necessity of preventive medicine more than has been done. Men are turned out of these colleges from time to time with no knowledge of sanitary measures, not only with reference to these cases of ophthalmia neonatorum, but in other lines.

Dr. Miguel Marquez, Chihuahua, Mexico, read a paper entitled,

"Construction and Care of Streets from a Public Health Standpoint." (See page 188.)

Dr. Allerton S. Cushman, Assistant Director, Office Public Roads, U. S. Department of Agriculture, followed with remarks on "The Public Road in its Relation to the Public Health." (See page 194.)

DISCUSSION.

Dr. Quitman Kohnke, of Covington, Louisiana: Mr. President: Those of us who went to Mexico last year realize that the paper presented, though idealistic in its aim and trend, is really an indication of what Mexico is trying to accomplish practically. Such a paper written of an American city would seem extreme. The idea of cutting down our high buildings and widening our streets is too radical, but in Mexico it is not too radical. In Mexico pure science obtains in health matters to a far greater extent than in many parts of our home country.

I am glad the two papers were on similar lines, for we have demonstrated by one of our own countrymen to the Mexican members present that such things are accomplished in the United States with regard to roads in their relation to the public health in the suppression of dust. Doubtless, our Mexican friends will go home with this idea, and should any of us visit Mexico in the next year or so, I opine we will find there a practical illustration of what has been learned by them at this meeting from one of our engineers.

Dr. Hiram Code of New York: There was a point made by the first speaker in his paper which unfortunately he did not include in his conclusions, namely, in our study of highways we ought to make provisions for public comfort stations. That is one of the disgraces of our modern civilization, in that we leave it to the saloon-keeper and the store keeper to furnish the necessary means for our personal comfort. It can be stated without contradiction, I think, that the saloon-keeper finds that his efforts along that line are much more profitable than the free lunch counter.

Dr. Charles V. Chapin, of Providence, R. I., read a paper on "Contact Infection." (See page 57.)

Dr. Henry Mitchell of Asbury Park, N. J.: Mr. President: The outbreak of typhoid fever which occurred in the state hospital at Preston during the past summer was traced to contact infection. The first patient sickened during the month of February, but the nature of the ailment was not recognized until several weeks had elapsed after the illness began. The next patient was a roommate of the first, and other successive patients were quartered near the

first and second. This was the asylum for the insane, and, as you all know, the best efforts of the nurses and attendants in such institutions to prevent contact between the inmates and to prevent uncleanly practices on the part of the patients are attended with great difficulty. The outbreak was first brought to the attention of the State Board of Health on the 11th of June, and up to that time there had been thirteen cases in the institution. Investigations were immediately undertaken and were directed to the water supply, the food supply, including milk, shellfish, uncooked vegetables, etc. The bowel and urinary discharges of the attendants who handled the food were examined in the State Laboratory of Hygiene, but the results of these examinations were negative. The demand of the public for information in regard to the cause of the outbreak was clamorous and persistent, but the Board refrained from expressing an opinion until the investigation was completed.

The final report in regard to the probable cause of the extension of the disease was that it was due to contact infection, and the reasons for the opinion, briefly stated, are these: The water supply was the same for the entire institution, there being about one thousand inmates located in the two principal buildings, but the disease was confined largely to one wing of the main building, although it finally spread to all of the wards of that building. But the other building, known as the annex, containing four hundred inmates, did not have a single case of typhoid fever. The food, water, and all other supplies were precisely the same for both buildings, all being from the same sources. A number of persons were affected with the disease who did not live in the institution, but who dwelt in buildings on the institution grounds, some of whom were employees and others being members of the employee's families. There was some difficulty in learning how it happened that these people were infected, but it was found, in the course of the inquiry, that all of these persons obtained portions of their supplies of food from the hospital kitchens, and as the epidemic advanced every article of food which was received in the kitchens became liable to be infected.

Dr. J. J. Kinyoun, of Washington, D. C., read a paper entitled, "Uncinariasis in Florida." (See page 123.)

On motion, the Association adjourned until Friday morning, at 10 A. M.

OCTOBER 4TH, 1907.

FOURTH DAY, MORNING SESSION.

The Association met at 10 A. M., and was called to order by the President.

After some announcements by Dr. Guion, Chairman of the Local Committee of Arrangements, the Secretary stated that the Executive Committee had considered the resolution presented by Dr. Wilbur at a previous session, and recommended its passage by the Association with the following preamble:

WHEREAS, The Commonwealth of Australia, by its Bureau of Census and Statistics, acting upon the recommendation of a statistical conference participated in by every state of the commonwealth, and by New Zeland, has adopted the International Classification of Causes of Death, as proposed by this Association, and published a translation thereof "for the use of members of the medical profession, of statisticians, of registrars of death, and for general information," therefore, be it

Resolved, That the American Public Health Association extends its cordial congratulation to the Commonwealth Bureau of Census and Statistics, and to the Statistical Conference of Australasia, upon the adoption of the International Classification of Causes of Death, and welcomes the possibility of more satisfactory comparison of data for Australasia and America made possible thereby.

On motion, the preamble and resolution were adopted.

THE SECRETARY: The Executive Committee recommends that the resolution calling for the appointment of a committee of three of this Association to cooperate with the committee of the American Medical Association on ophthalmia neonatorum with reference to measures for the prevention of this disease, be adopted, and that such a committee be authorized.

It was moved that the resolution be adopted, and the recommendation [illegible] Seconded by several and carried.

THE PRESIDENT: We will now listen to the report of the Advisory Council.

The following report of the Advisory Council was read by Dr. C. A. Hodgetts:

REPORT OF THE ADVISORY COUNCIL.

The Advisory Council begs to recommend, as follows:

1. That the next place of meeting be the city of Winnipeg, Manitoba, Dominion of Canada.

2. Date of the meeting to be some time in the month of August, 1908.

3. As officers for the ensuing year, the Council recommends the following:

President, Dr. Richard H. Lewis, Raleigh, N. C.
First Vice-President, Dr. Gardner T. Swarts, Providence, R. I.
Second Vice-President, Dr. Charles A. Hodgetts, Toronto, Can.
Third Vice-President, Dr. Manuel Iglesias, Vera Cruz, Mexico.
Treasurer, Dr. Frank W. Wright, New Haven, Conn.

The Council further recommends that the following be appointed members of the Executive Committee in lieu of the retiring members: Dr. Herbert D. Pease, Albany, New York; Dr. C. A. Harper, Madison, Wisconsin; Dr. J. Y. Porter, Jacksonville, Florida, and that Dr. John S. Fulton be appointed to fill the vacancy created by Dr. Lewis in becoming President, to serve for a period of one year, all of which is respectfully submitted.

CHARLES A. HODGETTS,
Secretary Advisory Council.

Dr. Frederick Montizambert moved that the Secretary cast the unanimous ballot of the Association for the election of the officers named.

This motion was seconded by several, and carried.

The Secretary then cast the ballot of the Association for the list of officers as read, and they were declared duly elected.

It was then moved and seconded that the action of the Advisory Council in selecting Winnipeg as the next place of meeting be approved by the Association. Carried.

The Secretary announced the following officers of the new Section on Vital Statistics: Dr. John N. Hurty, of Indianapolis, Chairman; Dr. Charles A. Hodgetts, of Toronto, Ont., Vice-Chairman; Secretary, Dr. W. R. Batt, of Harrisburg, Pa.; Council, above officers; Dr. Charles V. Chapin, of Providence, R. I.; Dr. Jesus E. Monjaras, of Mexico City; Dr. Martin O. Heckard, of Chicago; Dr. Wm. C. Woodward, of Washington, D. C., and Dr. Cressy L. Wilbur, of Washington, D. C., as Advisory Member.

It was moved and seconded that these officers be recommended to the Association for its approval, and that the Secretary be instructed to cast the ballot of the Association for their election. Carried.

The Secretary did this, and they were declared duly elected.

The President appointed Drs. Frederick Montizambert and Alfonso Pruneda to escort the President-elect to the platform.

The retiring President, Dr. Orvananos, said he considered it a great honor and privilege to introduce the newly-elected President for the ensuing year, Dr. Lewis, and thanked Dr. Lewis for his kindness last year in Mexico in yielding the presidency to him.

Dr. Lewis, in accepting the presidency, said: It gave me great pleasure last year to withdraw in favor of the distinguished gentleman from Mexico, Dr. Orvananos, and I am sure that the Association has been pleased with the selection that was then made.

I wish to express my appreciation to this Association for the great honor it has conferred upon me. When I look on the line of my predecessors, the able men who have held this office, I really feel that I am an amateur in this business, and that it will be impossible for me to fill their shoes. But I assure you, gentlemen, it will be my pleasure, as well as my duty, to do everything in my power to advance the interests of the American Public Health Association. (Applause.)

REPORT OF THE COMMITTEE TO INVITE THE CONFERENCE OF STATE AND PROVINCIAL BOARDS OF HEALTH OF NORTH AMERICA TO AFFILIATE WITH THE AMERICAN PUBLIC HEALTH ASSOCIATION

DR. GARDNER T. SWARTS, CHAIRMAN, PROVIDENCE, RHODE ISLAND.

Your committee presented the invitation of this Association to the Conference of State and Provincial Boards of Health of North America at its last meeting, held in June in Washington. The object of the invitation was expressed to the effect that they should become a section of the American Public Health Association. As many of you know, the members of the Conference are made up almost entirely of the active members of this Association, and after the Conference had considered this subject, its members voted not to accept the invitation, but to thank the Association for its kindness in offering its assistance to the Conference. The reasons given for this in the discussion were that the Conference was originated for the same reasons that these separate sections have been originated or organized, namely, for the purpose of having free and full discussions upon technical subjects of interest to the executive health officers of states and of sanitary organizations, and they do not find time in the general sessions of the Association to carry on that work. The members further felt they ought to organize and become thoroughly established in their work in a way that it would not facilitate matters to affiliate with this Association. And another reason is that you will see when you reflect upon the matter of who the members are and their connection with the Association. They are men who are interested not only in sanitary matters, but in statistics, in laboratory work, which they must necessarily be familiar with, and if they would attempt to meet three or four different sections such as have been established, namely, a section on vital statistics, a laboratory section, a section on municipal health officers, and their own section,

and endeavor to be in four places at once, or so subdivided personally, they would not know how they stood.

Another point which was thoroughly considered was the making of two or three different trips to different parts of the country during the year to attend meetings. But it so happens that the federal government has provided that it is unnecessary for state officers to meet with the Public Health and Marine Hospital Service once a year, and these officers should be in close touch with the workings of that department, and with the officers of that department it is so arranged that we can meet at the same time and in the same place, keeping in such close touch with one another that we may know wherein to cooperate. We are, therefore, obliged to state that the Conference, feeling its obligations to the Association for its kind endeavor to assist it, is obliged to decline the invitation.

In view of what I have said, I would move, therefore, that the report of the committee be accepted and that the committee be discharged.

Seconded and carried.

REPORT OF COMMITTEE ON THE ESTABLISHMENT OF AN ASSOCIATION JOURNAL.

DR. HENRY MITCHELL, of Asbury Park, N. J.: There has been some progress made during the past year in the study and examination of the question of journalizing the proceedings of this Association, but it has been found impossible to present to any publisher a definite proposition. The difficulties are almost entirely financial. If we had a membership sufficiently large, or if we could guarantee a publisher a sufficient number of subscribers to protect him against loss, we would be able to find a publisher without difficulty. My suggestion at the present time, in the light of this inquiry which has been continued during the past year, is that a committee, preferably a new committee, be appointed to continue the agitation of this matter, as there are some reasons for the belief that in year after next, namely, in 1909, a more favorable state of affairs may exist. The committee recommends that the inquiry in relation to the establishment of an Association journal be continued.

DR. GARDNER T. SWARTS: I move that the report of the committee be accepted, and that the old committee be continued.

Seconded and carried.

Dr. John S. Fulton of Washington, D. C., made a verbal report as General Chairman of the four national committees appointed with reference to securing a National Department of Health in each country.

REPORT OF COMMITTEE ON A NATIONAL DEPARTMENT OF HEALTH FOR THE FOUR COUNTRIES REPRESENTED IN THE ASSOCIATION

JOHN S. FULTON, M. D., WASHINGTON, GENERAL CHAIRMAN

I have been informed by a friend, who ought to know, that shortly after my return from Mexico, last year, Dr. Probst notified me about my duties as chairman of this committee, and that I at once addressed letters to all the other members of the committee asking them to let me have their views on this subject. I have been negligent of the duty which you assigned to me, and I can offer no excuse but my forgetfulness. At this moment I recall it quite clearly. The committee was instructed to look into the feasibility of establishing a Department of Public Health in each of the four countries represented in this Association.

At the outset we must define a department of public health. In the United States a federal department has for its chief a secretary who is a cabinet officer. This is not the case in the other countries. Therefore, the proposition does not mean the same thing to all of the members of the committee, unless all of us want a minister of public health. In England the propriety of creating a ministry of public health has been discussed, but in England a minister of public health would not be an official of quite such high rank as would a secretary of public health in this country, and no country I believe has a hygienist in the next to the highest governmental grade. For us, citizens of the United States, this proposition is a degree more ambitious than it is for any of the other countries, having membership in this Association.

The American Medical Association has for a long time been advocating a department of public health in precisely this exalted sense, but I doubt if the members of that Association, or even the members of the Association's House of Delegates, know just what they are advocating. At all events the medical profession of the country talk about a national board of health, a federal bureau of health, and department of health as if all these things were synonymous. The American Public Health Association has also frequently discussed the advisability of nationalizing public hygiene, but without committing itself in recent years at least, to a project as definite as that recommended by the legislative committee of the American Medical Association.

I think most of us have known all along that it is impossible to add to the cabinet a secretary of public health. No recent president of the

United States would have consented to such a proposition. Mr. Roosevelt is known to be opposed to any further expansion of the cabinet. There are too many cabinet officers now. This is a very practical difficulty, and not likely to disappear for years to come.

Even if it were possible, I doubt if it would be desirable to create a separate department of public health. The practice of public hygiene is older and more advanced in some other countries than in our own, yet there is no example of a national department of public health. Should we not be thinking of ourselves more highly than we ought to think if we should advocate such a project? Of course the objects of public hygiene are not outranked by any governmental function whatsoever. But are we prepared to say that its practice has developed a class of men who could create a real department of public health? I doubt it. Here in this Association are the hygienists of this country. Within the past ten years we have listened with patience to papers on the disinfection of houses by means of coffee smoke, on infinitesimal questions of diet, and on other trivial topics, and we have advertised our infantilism to the world by printing such papers in our transactions. We have hardly shed our milk teeth. Our laboratory section is but a few years old, and until this year the laboratory section offered the only evidence that we were beginning to acquire the appliances of modern hygiene. We have created this week a section on vital statistics, and we think of creating a section for municipal health officers. We are awake and moving; our feet are fairly steady, and we have fair command of our arms and of a few tools, but I think we are not quite ready to undertake the creation of an independent department of public health. We are good enough to undertake the co-ordination of a good working bureau out of the elements to be found already in existence, to give them all definite aim and measurable effect, to bring some new agencies into the field, and to give our subject that firm footing in national politics which will assure sound progress to our children.

There are now three agencies in this country which, if they pulled together, could bring a real bureau of public health into existence. The American Medical Association is one of these agencies, the American Public Health Association is another, and the third, having originated outside of the medical profession, and outside the profession of hygiene, is the most interesting of the three. The Association for the Advancement of Science gave a start to this movement. Two years a young professor of political economy, Mr. J. Pease Norton of Yale, read a paper in which he discussed the agencies of public hygiene already existing in several federal bureaus, pointed out some

lines of hygienic work which ought to become governmental functions, and made a good economic argument for a department of public health. Following the presentation of this paper, the Association authorized the formation of a "Committee of One Hundred" to inform public opinion, and to influence national legislation on the subject of public health. In forming that committee the Association did not draw largely on the medical profession, nor the practicing hygienists. The committee includes many men of great influence in the work of education, in philanthropy, in the natural sciences, and in political and social science. This course, I think, was advantageous, for it has put the subject in which we are professionally interested, fairly before a strong body of men having a wide outlook on human affairs. The committee itself realizes, on the other hand, some disadvantages in its numerical limitations, though I believe that its exemption from anything like class distinction or technical bias amply compensates these disadvantages. This Committee of One Hundred proposes to make an active campaign of publicity, and will undertake some of the work which we have been halting at for several years. It would not be surprising if this committee should get into the field ahead of us with a journal of public health. The question of ways and means promises to be easier for this committee than for us. Probably they will be able to carry on thorough investigations by paid agents, and in this way they may be able to assemble in a year or two such accounts and kinds of evidence as will convince the people of the United States that the interests of public health are most imperfectly served by existing agencies, and that the whole practice of public hygiene needs intensive cultivation both in the states and in the nation.

Speaking for this committee above I recommend the appointment of a committee or the continuance of this committee, with instructions to cooperate with the Committee of One Hundred and with the American Medical Association in the work of nationalizing the practice of public hygiene.

The President. You have heard the report of this committee, as made by Dr. Fulton. What action will you take on it?

Dr. Chancellor E. Sawyer. I move that the report of the committee be accepted and that the committee be continued.

Seconded.

Dr. Hurty. I would move to amend that this committee be instructed to confer with other committees from other associations on the same subject.

Dr. Charles O. Probst, of Columbus, Ohio. I wish to say a word

or two in support of the proposition of Dr. Fulton, that we should not strive for a cabinet officer at this time.

It strikes me, that the most important work this Association can do now is not with Congress, but with the American Medical Association. Dr. Fulton, for some reason or other, failed to mention a significant fact, as I regard it, and that is, that President Roosevelt has expressed himself as favorable to the creation of a Bureau of Public Health, but is unalterably opposed to a cabinet minister. Now, we know what that means, and any way, it would be absolute folly for us to go before Congress divided in this matter. Unless we can persuade the American Medical Association to abandon its position for a cabinet minister and unite with us and the Committee of One Hundred in asking for a Bureau of Public Health, I fear our efforts will amount to nought.

Dr. William C. Woodward, of Washington, D. C.: I fully concur in the general trend of the report. Our cabinet, however, is not an integral part of our government. It is merely termed "Cabinet" by courtesy. It is not a voting body, so that there can be no serious objection, except from the standpoint of pure politics, to increasing its size. But it may be looked upon practically as a political body—political at times, possibly almost in an offensive sense; political in any event to the extent that the membership in the cabinet is bound to change with any change in the politics of the administration—so that I believe our efforts toward establishing a Bureau of Health are much better directed than any we may make toward establishing a Department of Health. A Bureau of Health under a Commissioner of Health would be an ideal arrangement. Those of us who are familiar with the magnificent work done by our Bureau of Labor will not look for any better organization than that body. Perhaps the Commissioner of Health should be directly responsible to the President of the United States, as was the Commissioner of Labor at one time, but that is a minor point and can well be left to be adjusted later.

I do not agree with Dr. Probst, that we must induce the American Medical Association to lower its demands before we are in a position to attain our own. I believe that if the American Medical Association demands a Department of Health, and any other responsible and representative body suggests that we be given something less, our chances of having our wishes granted by congress will not be seriously interfered with. (Applause.)

Professor Franklin C. Robinson, of Brunswick, Maine: I am of the opinion that the "Committee of One Hundred," to which reference has been made by previous speakers, did a wise thing when they de-

cided to give up agitating for a cabinet minister of public health in the United States, and work for a bureau instead.

Dr. Frederick L. Sawyer, of Providence, R. I.: It seems to me in this discussion, we have lost sight of the original question, namely the practicability and method of forming this bureau of public health. It is better for us to work for that which we can get rather than lose everything. I think if an expression of opinion could be had, the boards of health of this country would desire that such a bureau of public welfare outside of politics. I do not think they would demand such a high office as that of cabinet officer. Such a department of health, when organized, should be authorized to utilize the laboratories and research departments already working on separate lines. These are the departments of the Agricultural Bureau, Animal Industry, Public Health and Marine Hospital Service, the biological, chemical and bacteriological laboratories connected with these departments under a secretary head, without interference with their own work. The general bureau would have the duties of examination of [illegible] department.

[illegible] I would like to see this [illegible] public health, with [illegible] think that would be applicable to [illegible] as well as every country, and I would move [illegible] to this effect that the [illegible] their earnest efforts in [illegible] to attain this end. Let there [illegible] represented in this Asso-[illegible]

[illegible] except the amendment.

[illegible] was seconded, and the original motion as amended [illegible]

[illegible] Dr. Herman Kobbe read some [illegible] late Dr. James Carroll, [illegible] vol that a committee be [illegible] the correspondence namely [illegible]

[illegible] and it is fitting that [illegible] would be acted on in a manner [illegible] part of the Level was [illegible]

[illegible] We have [illegible] representatives of four na[illegible] anything about the great

work done by Dr. Carroll, and I simply rise to suggest that all of these members be made a committee of the whole in their respective parts of the countries, and do whatever they can to further this matter. I think it would be a good idea for every man to consider himself a member of this committee, with a view to seeing what can be done toward the suitable recognition of the work of Dr. Carroll.

One other remark I want to make is this: Dr. James Carroll was born near Woolwich, England, but the old country has not sent us in our generation a more honored son than James Carroll, who gave up his life under the banner of the United States for the good of mankind. (Applause.)

The mover of the original motion accepted the amendment only in as far as it applies in a general way, but was unwilling to relieve a special committee of the special duty because of its enlargement by the amendment.

The original motion as amended was then put and carried.

The President appointed as this committee Dr. Quitman Kohnke, Louisiana; Major Ireland, U. S. Army, and Eduardo Liceaga, Mexico.

A member of the Section on Vital Statistics presented the following resolution:

Resolved, That the Section on Vital Statistics of the American Public Health Association desires to express to the officers of this Association their appreciation of the courtesies, privileges, and encouragement which have been extended to this Section in its organization.

It was moved and seconded that the resolution be adopted. Carried.

Professor Franklin C. Robinson presented the following resolutions of thanks:

1. *Resolved*, That the thanks of the Association be extended to the various organizations and persons who have done so much to make this meeting successful and profitable.

2. *Resolved*, That our thanks be extended to Dr. Henry Mitchell, by whose advice we came, and whose predictions as to our satisfaction in coming have been so fully realized.

3. *Resolved*, That our thanks be extended to the Local Committee of Arrangements, and especially to Dr. Edward Guion, its most efficient head, for the care of the necessary details in connection with our meeting. And we would include in this vote of thanks Mrs. Guion, to whom the ladies of our party are under great obligations for many courtesies and pleasures.

4. *Resolved*, That our thanks be extended to the Atlantic City Board of Health, the members of which interested themselves from the first in our meetings and made most substantial contributions to their success.

5. *Resolved*, That our thanks be extended to the New Jersey San-

nitary Association, whose members so generally and generously united with us in the meetings, cordially mingled with us, and have given us such a favorable impression as to the kind of men engaged in sanitary work in this state.

6. And, finally, *Resolved*, That we express our appreciation of the excellence of our hotel accommodations. It is not necessary for us to thank the hotel management for this, for the best part of it all is our conviction that this service is only what they give to all their guests. But certainly it will be long before we shall forget the uniform courtesy of the management and all the attendants of this beautiful hotel in which we have met for this, our thirty-fifth annual meeting.

On motion of Dr. Wm. Bailey, the resolutions were adopted.

On motion, the Secretary was instructed to send a personal letter to all of the people mentioned in the resolutions.

Dr. Chadwick F. Swarts. I would like to ask whether or not it is practicable for the program committee to issue the program of next year at least a week before the opening session, in order that those who are going to attend the meeting may gauge their time of departure and return and not be on hand when their papers are called.

The Secretary. I think it would be desirable if that could be done. Heretofore, however, it has not been practical, but I do not know whether this can be done for the next meeting or not.

Mr. Robert L. Morris, Investigator Bureau of Municipal Research, New York City, read a paper entitled, "Relation of Health Budgets to Health Efficiency." (See paper, page 274.)

DISCUSSION.

Dr. Charles V. Chapin, of Providence, R. I. Mr. President. I am much pleased to the writer of the paper for his criticism of the reports of health officers. I have had some experience in the study of these reports while looking up various subjects, such as garbage disposal. Every health report contains a financial statement, but it is rare indeed that any of these statements is of the slightest value. They very often have the trick which the writer referred to, of lumping the salaries in a bunch, and that prevents one from finding out the amount which has been expended for the care of contagious diseases, for the removal of garbage, for school inspection, or for any other purpose. I know one health report in which the financial statement covers several pages and consists simply of a list of persons to whom amounts of money have been paid, without reference to what the service was for, so that this statement is absolutely useless. It is high time that health officers study this question and arrange the financial part of their re-

ports as suggested in this paper, so that it will be easy to tell at a glance how much was expended for each particular function.

DR. QUITMAN KOHNKE, of Covington, Louisiana: The paper we have just heard is based upon the law of New York, where the boards of health depend on municipal appropriations directed to the purposes. But that law is not similar to the laws of other states. There is no unity of law on the subject of supporting a health department, and the appropriation in New York doubtless includes all the funds given to the health department.

In Louisiana, and particularly in New Orleans, the board of health does not depend entirely on municipal appropriations. The New Orleans Board of Health spends during the ordinary performance of its functions about fifty thousand dollars, over twenty-five thousand dollars of which consists of a municipal appropriation; and it is well in some places that boards of health be not supplied entirely by municipal appropriation. I will illustrate this by citing an instance.

After our yellow fever experience in New Orleans in 1898, the council, which is the legislative body, the appropriating body, desired foolishly, to do away with the board of health, for the reason that yellow fever occurred during its administration. That is not uncommon in New Orleans. Somebody must be blamed for something that has happened. The whole community cannot blame itself; the legislative body will not blame itself, so that the board of health is made the scapegoat. The councilmen, not one of whom had any knowledge of hygiene or experience in sanitary matters, decided to give the board of health five thousand dollars, believing erroneously that the board of health depended on the municipal appropriation for existence. The board of health had, however, revenues derived from fees for the registration of births, deaths, and the issuance of marriage licenses, etc., to the extent of one-half of its normal revenue. The board of health was not destroyed by the small appropriation; it would have been if its revenues depended entirely upon that appropriation. The issue was met by every employe, including all from the head to those who received a salary of more than $50.00 per month, giving up for one month all his salary, for the next month one-half of it, and in that way we tided over until the council came to its senses. This dual or multiple source of revenue is one of the reasons why the accounts of boards of health are not easily understood and made plain; that is to say, it is impossible to credit to each department the exact amount of money that is expended by that department. The importance of yellow fever for instance, with us, makes it necessary for everybody to join in when yellow fever occurs, and there is a consequent confusion in accounts.

It is impossible to differentiate between the expenses of a department employing men for one purpose who are utilized in another department during an emergency. It is unlikely that accounts of boards of health can be compared one with the other until their source of revenue is similar one to the other, and their expenditures more nearly regular than is the case with the board of health expenditures in New Orleans. Our board of health is never ready to meet a serious emergency and must always depend upon voluntary contributions of funds when such an emergency occurs. This is wrong, we all know, but it is a fact and must be considered as a factor, and in part a defense and excuse, and an explanation of why the accounts of such boards of health do not compare with the accounts of boards of health that are regulated with regard to ordinary sanitary matters. Those boards that meet extraordinary emergencies must be given a latitude which should not be allowed to those who do not. We are satisfied if every dollar of revenue is honestly and economically accounted for in the expense account.

Dr. [illegible] Reynolds of Brunswick, Maine. This paper brings to our minds some very important points of importance to those of us who have anything to do with health work. Do we get all the money we want to do our work? I suppose we would answer right off, No, we don't. Then the question comes up, Why don't we? This paper gives us the very initial suggestion that the reason may be a different one from what we frequently give. We are accustomed to say, when appropriations are refused or cut down, that the people do not appreciate good work as they should be. This paper brings out the thought that after all perhaps we are not a little to blame ourselves, and is it not possible for us to adopt some other method of bringing this matter to the attention of the people than simply demanding them? That has been the method in vogue of doing it in the past. The paper contains some excellent suggestions for us to think about. We should carry them into effect.

Dr. [illegible] Columbus, Ohio. I hope the author of this paper will [illegible] the other gentlemen something about [illegible] Bureau of Research and I was wishing while the [illegible] we had such bureau in our [illegible]. The paper is a valuable contribution, and [illegible] for some [illegible] that have been set forth.

Dr. [illegible] Washington, D. C. The reason why we [illegible] statements is not because the public [illegible] to be frank, we do not know how. We [illegible] bulletins or reports of

boards of health in the newspapers, and this practice would be dropped if the bulletins were not read by the people. We cannot plead a lack of popular interest in what we have to say. The making of proper financial statements is a highly specialized function of government. I believe that these statements should be made, so as to show the relations of units of value to units of work. We need standards. If Mr. Miles can show us how to make such financial statements, it will be one of the best services he can render to us. Undoubtedly, we can learn to make these statements, but at present we must say frankly, that what he proposes is one of the things we do not know how to do.

MR. MILES (closing the discussion): I have been much interested in the points of view which the discussion has brought out. The experience of the members of this body will add a great deal to the elucidation of this whole subject.

In regard to the remarks made by Dr. Kohnke, I think that anyone who is fair-minded will admit that there are difficulties in the way of presenting adequate, clear, accurate statements of cost, particularly as regards the functions and activities of boards of health. For ten months I was in close connection with the board of health in New York City, and that was one of the distinct impressions left on my mind, that health work is among the most difficult to express in terms of dollars and cents, and, at the same time, I think with some care and ingenuity in the management of accounts, it can be worked out very well, even where the difficulties are such as have been mentioned. A transfer, which is necessary at times in emergency cases, from one service to another, is a difficulty which can be handled well by accounting methods if the departments of health are willing to adopt those methods. I am frank to say, that there is as yet not sufficient appreciation of the value of knowing exactly the cost of each line of activity. For instance, it is of value to know just how much vaccination costs, how much the sanitary expenses are, how much the medical inspection of schools costs, etc. With proper accounting methods, well worked out, the cost of each can be ascertained. Health departments are not at all unique in not having worked out any such system as yet. But I think the time is coming soon when the necessity for such a careful accounting will be recognized. The difficulty also of expressing in accurate terms the results of expenditures is apparent, as mentioned by Dr. Probst, and is also one which is recognized by the Bureau. One can spend certain sums of money every year in vaccinating the citizens of a community, but we cannot tell just how much immunity which that city enjoys is due to the expenditure of say five thousand dollars for any part of the year. It takes in a good many cases, statements cov-

ering a service of several years to show the tendency of value of public health work. We cannot judge of the tendency of public health in a great many respects without referring to the facts covering several years. I do think, however, that this problem can be worked out, and the Bureau to which I alluded in my paper has attempted to make some suggestion in that line. There is a rather formidable array of tables, more or less for technical use, yet made as popular as they can be made, which indicate the Bureau's attempt to work out the problems referred to in the paper in regard to New York City.

Dr. Probst has asked me to say a word or two about the Bureau of Municipal Research. It is an organization that has been established not over two years, and is interested in the technique of city administration. It believes that the inefficiency of city departments is a problem not to be attacked primarily through elective politics, taking whoever happens to be in office. It believes that the official is willing to co-operate with the public in making his department as efficient as possible. It is going to be to his credit to give an efficient administration; therefore, the Bureau offers its services to work out the technical methods by which administration can be brought to a higher state of efficiency. It is supported entirely by contributions.

I should like to suggest, in closing, that the Bureau of Municipal Research will be only too glad to co-operate with any health officials of this Association, and of this country, in making suggestions which may make for a more efficient administration of their departments.

There being no further business to come before the meeting, the President declared the Association adjourned to meet in Winnipeg in 1908.

CONSTITUTION

OF THE

AMERICAN PUBLIC HEALTH ASSOCIATION.

TITLE.

I. This Association shall be called "THE AMERICAN PUBLIC HEALTH ASSOCIATION."

OBJECTS.

II. The objects of the Association shall be the advancement of sanitary science, and the promotion of organizations and the measures for the practical application of public hygiene.

MEMBERS.

III. The members of the Association shall be known as Active, Associate, and Foreign.

The Executive Committee shall determine for which class a candidate shall be proposed. The Active members shall constitute the permanent body of the Association, subject to the provision of the Constitution as to continuance in membership. They shall be selected with special reference to their acknowledged interest in, or devotion to, sanitary studies and allied science, and to the practical application of the same. The Associate members shall be elected with special reference to their general interest only in sanitary science, and shall have all the privileges and publications of the Association, but shall not be entitled to vote or hold office. Health officials, and other persons especially interested in matters relating to the public health of countries not included in the Association, may be elected as Foreign members. They shall have all the privileges and publications of the Association, but shall not be entitled to vote or hold office.

Delegates from national, state, provincial, and municipal boards of health, organized sanitary associations, and the army, navy, and public health and marine hospital service, shall be entitled to be enrolled as Active members upon presentation of their credentials to the Executive Committee. Members, not delegates from such bodies, shall be elected as follows:

Each candidate for admission shall first be proposed to the Executive Committee, in writing (which may be done at any time), with a statement of the business or profession and special qualifications of the person so proposed. On recommendation of a majority of the committee, and on receiving a vote of two-thirds of the members present at the regular meeting, the candidate shall be declared duly elected a member of the Association. The annual fee of membership in each class shall be $5.00.

OFFICERS.

IV. The officers shall be a President, a First and Second Vice-President, a Secretary, and a Treasurer, and the officers of the various sections.

All the officers shall be elected by ballot, annually, except the Secretary, who shall be elected for a term of three years.

PRESIDING OFFICER.

V. The President, or in his absence one of the Vice-Presidents, or in their absence a chairman pro tempore, shall preside at all meetings of the Association. He shall preserve order, and shall decide all questions of order, subject to appeal to the Association. He shall also appoint all committees authorized by the Association, unless otherwise specially ordered.

SECRETARY.

VI. The Secretary shall have charge of the correspondence and records of the Association; and he shall also perform the duties of Librarian. He, together with the presiding officer, shall certify all acts of the Association. He shall, under the direction of the Executive Committee, give due notice of the time and place of all meetings of the Association, and attend the same. He shall keep fair and accurate records of all the proceedings and orders of the Association; and shall give notice to the several officers, and to the Executive and other committees of all votes, orders, resolves, and proceedings of the Association, affecting them or appertaining to their respective duties.

TREASURER.

VII. The Treasurer shall collect and take charge of the funds and securities of the Association. Out of these funds he shall pay such sums only as may be ordered by the Association, or by the Executive

Committee. He shall keep a true account of his receipts and payments, and at each annual meeting render the same to the Association, when a committee shall be appointed to audit his accounts. If, from the annual report of the Treasurer, there shall appear to be a balance against the treasury, no appropriation of money shall be made for any object but the necessary current expenses of the Association, until such balance shall be paid.

STANDING COMMITTEES.

VIII. There shall be the following standing committees: (1) The Executive Committee, (2) the Advisory Council, (3) the Committee on Publication.

EXECUTIVE COMMITTEE.

IX. The Executive Committee shall consist (1) of the President, First Vice-President, Second Vice-President, Secretary, Treasurer, and Chairmen of the various sections; (2) of six active members of whom three shall be elected annually by ballot to serve two years, and who shall be ineligible to reëlection for a second successive term; (3) of the ex-presidents of the Association; and (4) of the Chairman and Secretary of the Laboratory Section and the retiring Chairman of that section.

It shall be the duty of the Executive Committee to consider and recommend plans for promoting the objects of the Association, to authorize the disbursement and expenditure of unappropriated moneys in the treasury for the payment of current expenses; to consider all applications for membership, and at the regular meetings, report the names of such candidates as a majority shall approve; and, generally, to superintend the interests of the Association and execute all such duties as may, from time to time, be committed to them by the Association. At least one month preceding the annual meeting of the Association, the Executive Committee shall cause to be issued to members a notice of such meeting, and they are authorized to publish the same in medical, scientific, and other periodicals, but without expense to the Association; and such notice shall contain the order of business to be followed at said meeting, and briefly, the subjects to be presented and the special points of discussion.

ADVISORY COUNCIL.

X. The Advisory Council shall consist of one member from each state, territory, and district, the army, navy, and marine hospital ser-

vice, the Dominion of Canada, and each of the provinces, who shall be appointed by the President on the last day of each session and who, besides acting as nominating committee of officers for the ensuing year, to be announced at such time as the Executive Committee may appoint, shall consider such questions and make such recommendations to the Association as shall best secure the objects of the Association. They shall at their first meeting elect from their own number a secretary, whose record of their proceedings shall be made part of the records of the Association.

COMMITTEE ON PUBLICATIONS

XI. The Committee on Publication shall consist of a Chairman, the Secretary of the Association, the Treasurer of the Association, [illegible] each section of the Association, with the President [illegible] shall [illegible] and shall, subject to the approval and [illegible] authority of the Executive Committee, the proceedings of the Association, including such papers as have been examined and approved by the Executive Committee, or which have been submitted to and ordered by the latter for the [illegible] action.

[illegible]

XII. All committees preparing reports to be presented to the Association must submit the same to the Publication Committee not later than 60 days before the succeeding annual meeting of the Association, and all papers other than committee reports shall be in the hands of the Secretary not less than 30 days before [illegible]

[illegible]

XIII. The time and place of each annual meeting shall be fixed at the preceding annual meeting, but may be changed by the Executive Committee for reasons that shall be specified in the announcement of the meeting. Special meetings may be called at any time or place, by action of two-thirds of the Executive Committee. There [illegible] shall be [illegible] by laws or appropriate [illegible] [illegible] at that time in the treasury at each [illegible] [illegible] a vote of a majority of all the members of the Association. Whenever a special meeting is to be held, at least [illegible] shall, if possible, be given by circular to all the members [illegible] the order of business.

QUORUM.

XIV. At the annual meeting nine members shall constitute a quorum for the election of officers, a change of the constitution, the election of members, and the appropriation of moneys.

ORDER OF BUSINESS.

XV. The order of business at all meetings of the Association shall be fixed by the Executive Committee, and such order must be completed before any other business is introduced, except such order of business is suspended by a vote of four-fifths present.

ALTERATION OF CONSTITUTION.

XVI. No alteration in the constitution of the Association, shall be made except at an annual meeting, or unless such alteration shall have been proposed at a previous meeting, and entered on the minutes with the name of the member proposing the same, and shall be adopted by a vote of two-thirds of the members present.

SECTIONS.

XVII. Members of the Association may be authorized to form themselves into sections by vote of the Association at any annual meeting; such sections shall have power to nominate their officers to be elected by the Association, and to make by-laws which shall go into effect when approved by the Association.

BY-LAWS OF THE EXECUTIVE COMMITTEE.

QUORUM.

1. Five members shall constitute a quorum for the transaction of such business as may come before the committee.

MEMBERS RESTRICTED.

2. No elective member of the Executive Committee shall be at the same time a member of the Advisory Council, if there is another member of the Association from his state or service.

PARLIAMENTARY USAGE.

3. Cushing's Law and Practice of Legislative Assemblies shall be the guide in parliamentary practice until otherwise ordered.

PAPERS.

4. Papers to be presented at a general session of the Association shall be in the hands of the Secretary of the Association not less than twenty days before the coming meeting, and to be printed in the transactions in full or in abstract at the discretion of the Publication Committee.

5. All papers accepted by the Association, whether read in full, by abstract, by title, or filed, shall be delivered to the Secretary as soon as thus disposed of, as the exclusive property of the Association. Any paper presented to this Association and accepted by it shall be refused publication in the transactions of the Association, if it be published, in whole or in part, by permission or assent of its author, in any manner prior to the publication of the volume of transactions, unless written consent is obtained from the Publication Committee.

6. Day papers shall be limited to twenty minutes, and evening papers to thirty minutes each.

DISCUSSION OF PAPERS.

7. After the leading papers on each subject, as indicated by the Executive Committee, have been read discussion shall follow, and be confined strictly to the subject of these papers, and each speaker

shall be limited to ten minutes, and shall not speak a second time until after every other member who desires to be heard, and then only for five minutes, except by unanimous consent.

8. The Chair shall notify gentlemen who desire to speak to send their names, and they shall be called on in the order sent up; and he may, at his discretion, limit the time of speaking to five instead of ten minutes, if in his judgment it may become necessary to do so in order to allow each one on the list an opportunity to be heard.

PUBLICATION COMMITTEE.

9. The Publication Committee shall consist of a Chairman, the Secretary of the Association, the Treasurer of the Association, and a member of each section of the Association, with the President of the Association *ex-officio*.

10. Unless otherwise ordered by the Association, such committee is hereby instructed to keep the size of the annual transactions within the limits of four hundred pages; and to this end to conform to the several following rules:

a. Make summaries of such local and other addresses as are not of permanent scientific value.

b. The Chairman of the several Standing Committees shall be notified by the Secretary that the reports to be presented by them shall include any material prepared by the several members of their committees and must be in the hands of the Publication Committee not later than thirty days before the succeeding annual meeting for preliminary printing.

c. Such reports shall be printed for distribution to the members on registering at the coming meeting; but no report shall be printed unless in the hands of the Publication Committee, as specified above.

11. The Publication Committee shall procure a copyright on the transactions in the name of the Association, and the committee shall have full charge of the publication of the transactions.

APPLICATION FOR MEMBERSHIP.

12. All applications for membership must be made upon the application blank of the Association.

13. Persons not members, having prepared papers to be presented at the meetings of the Association, shall be proposed for membership at the first business meeting of the Association.

EXPENDITURES.

14. All bills connected with the publication of the transactions shall, upon the approval of the chairman of the Publication Committee and the Secretary, be signed by the President of the Association, and paid by check of the Treasurer directly to the party concerned; and the President shall not approve any bill, relating either to publishing or printing, without the approval first of the chairman of the committee in charge thereof.

15. Bills for current expenses shall be first approved by the Secretary, then sent to the President, and on his approval they shall be paid by check of the Treasurer directly to the parties interested.

16. The actual and necessary traveling expenses of the Secretary and Treasurer to the annual meeting of the Association, and [illegible] meeting of the Executive Committee, shall be classed as current expenses.

RESOLUTIONS.

17. All resolutions presented to the Association shall be sent to the Chair in writing, and referred to a committee without discussion.

ARREARAGES.

18. The arrearages of all members remitting their dues for two years shall be cancelled up to the date of the last payment, but they shall be entitled to the transactions of the Association only for the years for which they have actually paid.

AUDITING COMMITTEE.

19. An Auditing Committee shall be appointed by the Chair to audit the accounts of the Treasurer, and report upon the same.

OFFICERS 1907-8.

President, Dr. Richard H. Lewis.....Raleigh, N. C.
First Vice President, Dr. Gardner T. Swarts.....Providence, R. I.
Second Vice President, Dr. Charles A. Hodgetts.....Toronto, Ont.
Third Vice President, Dr. Manuel Iglesias.....Vera Cruz, Mex.
Secretary, Dr. Charles O. Probst.....Columbus, Ohio.
Treasurer, Dr. Frank W. Wright.....New Haven, Conn.

EX-PRESIDENTS OF THE ASSOCIATION.

Stephen Smith, M. D. ..... 1872, '73, '74
*Joseph M. Toner, M. D. 1875
*Edwin M. Snow, M. D. 1876
*John H. Rauch, M. D. 1877
*Elisha Harris, M. D. 1878
*James L. Cabell, M. D. 1879
John S. Billings, M. D. 1880
*Charles B. White, M. D. 1881
*Robert C. Kedzie, M. D. 1882
*Ezra M. Hunt, M. D. 1883
*Albert L. Gihon, M. D. 1884
*James E. Reeves, M. D. 1885
Henry P. Walcott, M. D. 1886
George M. Sternberg, M. D. 1887
Charles N. Hewitt, M. D. 1888
*Hosmer A. Johnson, M. D. 1889
Henry B. Baker, M. D. 1890
Frederick Montizambert, M. D. 1891
*Felix Formento, M. D. 1892
Samuel H. Durgin, M. D. 1893
Emmanuel P. Lachapelle, M. D. 1894
William Bailey, M. D. 1895
Eduardo Liceaga, M. D. 1896
*Henry B. Horlbeck, M. D. 1897
*Charles A. Lindsley, M. D. 1898
*George H. Rohe, M. D. 1899
Henry Mitchell, M. D. 1899
Peter H. Bryce, M. D. 1900
Benjamin Lee, M. D. 1901
Henry D. Holton, M. D. 1902
Walter Wyman, M. D. 1903
Carlos J. Finlay, M. D. 1904
Frank F. Wesbrook, M. D. 1905
Franklin C. Robinson, LL. D. 1906
Ignacio Ortvanos, M. D. 1907

* Deceased

STANDING COMMITTEES.

EXECUTIVE COMMITTEE.

[The Officers and Ex-Presidents of the Association and the Chairman, Secretary and retiring Chairman of the Laboratory Section are ex-officio members of the Executive Committee.]

ELECTED MEMBERS.

Mr. H. W. Clark ..... Boston, Mass.
Dr. Jesús Monjaras ..... Mexico City, Mex.
Dr. John S. Fulton ..... Washington, D. C.
Dr. H. D. Pease ..... Albany, N. Y.
Dr. C. A. Harris ..... Madison, Wis.
Dr. J. Y. Porter ..... Jacksonville, Fla.

PUBLICATION COMMITTEE.

Dr. Josiah Hartzell ..... Canton, Ohio.
Dr. C. O. Probst ..... Columbus, Ohio.
Dr. Frank W. Wright ..... New Haven, Conn.
Dr. Herbert D. Pease ..... Albany, N. Y.
The President ex-officio Member

ADVISORY COUNCIL.

United States

Alabama ....
Alaska ....
Arkansas ..
Arizona ..
California ..... Dr. [illegible] M. Pallette *Los Angeles*
Colorado ..
Connecticut ..... Dr. Frank W. Wright, *New Haven*
Delaware ..
Florida ..... Dr. J. Y. Porter *Jacksonville*
Georgia ..
Idaho ..
[illegible] ..
Illinois ..... Prof. Edward Bartow, *Urbana*
Indiana ..... Dr. Edward Bunker *Indianapolis*
Iowa ..... Dr. A. M. Linn *Des Moines*
Kansas
Kentucky ..... Dr. William Bailey *Louisville*
Louisiana ..... Dr. Quitman Kohnke *Covington*

Maine .....Dr. A. G. Young, *Augusta.*
Maryland .....Dr. M. L. Price, *Baltimore.*
Massachusetts .....James O. Jordan, *Boston.*
Michigan .....Dr. Guy L. Kiefer, *Detroit.*
Minnesota .....Dr. H. W. Hill, *Minneapolis.*
Mississippi .....Dr. H. McH. Folkes, *Biloxi.*
Missouri .....Dr. H. Wheeler Bond, *St. Louis.*
Montana .....
Nebraska .....
Nevada .....
New Hampshire .....Dr. G. P. Conn, *Concord.*
New Jersey .....Dr. James A. Exton, *Arlington.*
New Mexico .....Prof. John Weinzirl, *Albuquerque.*
New York .....Dr. Chas. F. Roberts, *New York.*
North Carolina .....Dr. R. H. Lewis, *Raleigh.*
North Dakota .....Dr. H. D. Quarry, *Grand Forks.*
Ohio .....Dr. E. V. Hug, *Lorain.*
Oklahoma Territory....
Oregon .....
Pennsylvania .....Dr. W. R. Batt, *Harrisburg*
Philippine Islands .....Dr. Wm E. Musgrave, *Manila.*
Porto Rico .....
Rhode Island .....Dr C V. Chapin, *Providence.*
South Carolina .....Dr. Chas. M. Rees, *Charleston.*
South Dakota .....
Tennessee .....Dr. Heber Jones, *Memphis*
Texas .....Dr. J. H. Smart, *Dallas.*
Utah .....Dr. T. B. Beatty, *Salt Lake City.*
Vermont .....Dr. H. D. Holton, *Brattleboro.*
Virginia .....Dr. E. C. Levy, *Richmond.*
Washington .....Dr. James B. Eagleson, *Seattle.*
West Virginia .....Dr. James H. Brownfield, *Fairmont.*
Wisconsin .....Dr. C. A. Harper, *Madison.*
District of Columbia...Dr. Wm. C. Woodward, *Washington.*
U S Army.....Dr M. W. Ireland, *Washington, D. C.*
U S Navy.....Dr. Dwight Dickinson, *Portsmouth, N. H.*
U S P. H. and M. H.
Service .....Dr. Joseph Goldberger, *Washington, D. C.*

Canada:

Dominion of Canada....Dr. F. Montizambert, *Ottawa.*
Alberta.....Dr. Jno. A. Macdonald, *Brandon.*
British Columbia .....Dr. C. J. Fagan, *Victoria.*
Manitoba .....Dr. A. J. Douglas, *Winnipeg*
New Brunswick .....Dr. E. Bayard Fisher, *Fredericton.*
Nova Scotia .....
Saskatchewan..... Dr. P. H. Bryce, *Ottawa.*
Ontario .....Dr. C. A. Hodgetts, *Toronto.*
Quebec .....Dr F. P. Lachapelle, *Montreal.*

CUBA:

Republic of Cuba.....Dr JUAN GUITERAS, *Havana.*

MEXICO:

Aguascalientes .....Dr A. PRUNEDA, *Mexico, D. F.*, 3a *de Soto* 4
Campeche .....Dr DOMINGO ORVANANOS, *Mexico, D. F.*, 1a *Sto. Domingo* 10
Colima .....Dr FRANCISCO ELIZALDES, *Mexico, D. F.*, 2a *Aduana Vieja* 7.
Coahuila .....Dr FRANCISCO ROMERO *Mexico, D. F.*, 1a *Amargura* 7
Chihuahua .....Dr MIGUEL MARQUEZ, *Chihuahua.*
Chiapas .....Dr L. E. RUIZ, *Mexico D. F.*
Durango .....Dr J. J. GOMEZ *Mexico, D. F.*
Guanajuato .....Dr J. COSIO, *Mexico, D. F.*
Guerrero .....Dr RICARDO CICERO, *Mexico, D. F.*, *Pte Legumes* 1
Hidalgo .....Dr ALBERTO ESPINOSA, *Pachuca*
Jalisco .....Dr ADOLFO OLIVA, *Guadalajara*
Michoacán .....Dr JESUS GONZALEZ URUENA, *Mexico, D. F.*, *Portillo S. Diego* 15
Morelos .....Dr FERNANDO LOPEZ, *Mexico, D. F.*, 1a *de las Artes* 1809.
Mexico .....Dr MANUEL URIBE TRONCOSO, *Mexico, D. F.*, *Leon* 2.
Nuevo León .....Dr. JESUS M. SALDAÑA, *Monterrey.*
Oaxaca .....Dr ALBERTO CARRERO, *Oaxaca*
Puebla .....Dr [illegible] *Puebla*
Queretaro .....Dr GONZALO SEPTIEN *Mexico, D. F.*, 2a *Sta Maria* 180
San Luis Potosi .....Dr [illegible] *San Luis Potosi*
Sonora .....Dr [illegible] *Mexico D. F.*, *Ortega* 7
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AMERICAN PUBLIC HEALTH ASSOCIATION.

1908.

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MEMBERS.

ADAMI, GEORGE J., M. D.	McGill University, Montreal, Quebec.	1905
ADAMS, J. F. A., M. D.	Pittsfield, Mass.	1881
AGUAYO, LUIS	Juan Manuel 12, Mexico City, D. F., Mex.	1907
ALEXANDER, EDWARD, M. D.	El Paso, Texas.	1892
ALTERT, HENRY, M. D.	221 S. Lucas St., Iowa City, Iowa.	1907
ALTAMIRA, FRANCISCO, M. D.	3a del Cipres 9, Mexico D. F., Mex.	1906
ALVAREZ, MARTINIANO, M. D.	Zacatlan, Puebla, Mex.	1906
ALVORD, J. W., C. E.	127 Hartford Building, Chicago, Ill.	1899
ALLEN, JOHN K.	49 53 North Jefferson St., Chicago, Ill.	1907
ALLEN, M. K., M. D.	321 Broadway, Louisville, Ky.	1907
AMOR, ROSENIO, M. D.	Pulqueria de Calaya 11, Mexico, D. F., Mex.	1906
ARCHER, ROBERT L.	Huntington, W. Va.	1906
*AMYOT, JNO. A., M. D.	30 St. Joseph St., Toronto, Ont.	1900
*ANDERSON, JOHN F., M. D., U. S. P. H. and M. H. S., Washington, D. C.		1903
*ARMS, BURDETT, M. D.	739 Boylston Street, Boston, Mass.	1906
ARMENT, SAMUEL B., M. D.	Bloomsburg, Pa.	1901
ASHERHOLT, GEORGE W.	517 City Hall, Philadelphia, Pa.	1907
*ATKINS, ERNEST F.	608-609 Tremont Bldg., Boston, Mass.	1900
BADING, GERHARD A., M. D.	2511 Wells Street, Milwaukee, Wis.	1906
BAILEY, WILLIAM, M. D.	215 Broadway, Louisville, Ky.	1879
BALDACHE, P. H., M. D.	P. H. and M. H. S., Stapleton, N. Y.	1874
*BALDWIN, HERBERT B.	927 Broad St., Newark, N. J.	1905
BARBER, PROF. MARSHALL ALBERT	1134 Mississippi St., Lawrence, Kan.	1906
BARTLETT, FRANK A., C. E.	1121 Tremont Bldg., Boston, Mass.	1900
BARNES, HENRY JAREZ, M. D.	429 Beacon St., Boston, Mass.	1896
BARTOL, JOHN W., M. D.	48 Chestnut St., Boston, Mass.	1904
*BARTOW, EDWARD	University of Illinois, Urbana, Ill.	1905
BASHORE, HARVEY B., M. D.	West Fairview, Pa.	1897
BASS, FREDERIC HERBERT, C. E.	116 Beacon St., Minneapolis, Minn.	1907
BATT, WILMER R., M. D.	1620 State St., Harrisburg, Pa.	1907
BATTLE, SAMUEL W., M. D.	Asheville, N. C.	1887

* Also members of Laboratory Section.

† Membership not completed

[illegible], M. D.	[illegible]	[illegible]
[illegible], M. D.	159½ State St., [illegible], Mass.	[illegible]
[illegible], M. D.	[illegible], Mex.	[illegible]
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BYRD, HIRAM, M. D. ..... Sixth Street, Jacksonville, Florida. 1907
BYRNE, SYLVESTER J. ..... 375 State St., Brooklyn, N. Y. 1907

*CAIRD JAMES M. ..... 271 River St., Troy, N. Y. 1900
CALVA GOYTIA, MANUEL, M. D. ..... Zarogoza 11, Puebla, Puebla, Mex. 1906
CAMERON, J CHALMERS, M. D. ..... 941 Dorchester St., Montreal, P. Q. 1894
CAMPBELL, ROBERT, M. D. ..... 374 Fulton St., Jamaica, N. Y. 1907
CAMPUZANO, JUAN D., M. D. ..... Flora 16, Mexico, D. F., Mex. 1906
CANALS, JOSE ANTONIO, C. E. ..... San Juan, Porto Rico. 1904
CANTRELL, GEO. M. D., M. D. ..... 116 Louisiana St., Little Rock, Ark 1902
CARNEGIE LIBRARY ..... Pittsburg, Pa 1902
CARTER, CHARLES A., M. D. ..... City Hall, Indianapolis, Ind. 1907
CASTANEDO, JOSE A., M. D. ..... Aguila 22, Mexico, D. F., Mex. 1906
CASTILLO ANCHONINO, M. D. ... Puente Quebrado 19, Mexico, D. F., Mex 1906
CASTLE, CHARLES S., M. D. ..... Rutland, Vt. 1894
CEVALLOS, DOMINGO, M. D. .....
2a de Hidalgo 63, Salvatierra, Guanajuato, Mex 1906
CHACON, AGUSTIN, M. D. ..... Cocheras 21, Mexico, D. F., Mex. 1906
CHAILLE, [illegible] STANFORD E. ..... P. O. Drawer 261, New Orleans, La. 1874
*[illegible] ..... Cornell University, Ithaca, N. Y. 1903
CHANDLER, PROF. C. F. ..... Columbia College, New York, N. Y. 1872
CHANDLER, DAVID D. ..... 74 North 7th St., Newark, N. J. 1896
CHAPIN, CHARLES V., M. D. ..... Providence, R. I. 1886
CHAPMAN W. C., M. D. ..... 1710 Madison St., Toledo, Ohio. 1900
CHASE, H. LINCOLN, M. D. ..... Brookline, Mass. 1895
CHASE, JOHN C., C. E. ..... Derry, N. H. 1890
CHASSAIGNAC, CHARLES, M. D. ..... 830 Canal St., New Orleans, La 1904
CHAVEZ LORENZO, M. D. .. Portillo de San Diego 11, Mexico, D. F., Mex. 1906
CHAVEZ, TOMAS, M. D. ..... Guanajuato, Guanajuato, Mex. 1906
CHEESEMAN, THOMAS TEASDALE, M. D. ..... 60 Lincoln Ave., Salem, Ohio. 1890
CICERO, RICARDO E., M. D. .. Puente de Laquisamo 1, Mexico, D. F., Mex. 1906
*CLARK, HARRY W. ..... Room 502, State House, Boston, Mass. 1896
CLARKE, PAUL F. ..... State House, Providence, R. I. 1906
COFFEY, JAMES C. ..... Worcester, Mass. 1896
COLE HILLS, M. D. ..... 1748 Broadway, New York, N. Y. 1907
CONN, G. P., M. D. ..... Concord, N. H. 1875
*CONN, H. W., M. D. ..... Middletown, Conn 1907
CONNELL, JAMES G, M. D. ..... Forbes Building, Pittsburgh, Pa. 1906
CONNER, P. S., M. D. ..... 215 West Ninth St., Cincinnati, Ohio 1884
*CONNOLLY, R. N., M. D. ..... City Hospital, Newark, N. J. 1898
*COPLIN, WILLIAM L. ..... 1629 South Broad St, Philadelphia, Pa. 1897
CORBETT, J. F., M. D. ..... 2446 Park Ave., Minneapolis, Minn. 1899
CORDOVA Y VALOIS, PABLO, M. D. ..... 2a Ancha 10, Mexico, D. F., Mex. 1906
COSIO, JOAQUIN, M. D. ..... Ortega 9, Mexico, D. F., Mex. 1906
*COSTER, W. H. ..... Sixth Ave. and Cherry Alley, Pittsburg, Pa. 1901
COWING, HUGH A., M. D. ..... 210 High St., Muncie, Ind. 1900
CRAIN, M. RICHARDS, M. D. ..... 73 Centre Street, Rutland, Vermont. 1906
*CRISPELL, CHAS. W., M. D. ..... 60 West Chestnut St., Kingston, N. Y. 1907
CROWDER T. R., M. D. ..... Pullman Building, Chicago, Ill. 1905

* Also members of Laboratory Section.

Crum, Frederick Stephen	751 Clifton Ave., Newark, N. J.	1907
*Cunningham, Mott Cessna	Marietta, Pa.	1906
Curry, Glover Price Mitchell, M. D.	Mount Kisco, N. Y.	1906
Curtis, Francis George, M. D.	West Newton, Mass.	1897
Curtis, F. C., M. D.	17 Washington Ave., Albany, N. Y.	1903
Dalrymple, W. H., R. C. V. S.	State University, Baton Rouge, La.	1902
Darlington, Thomas, M. D.	48 59th St., New York, N. Y.	1907
*Davis, Floyd, Ph. D.	Des Moines, Ia.	1899
Davis, Mrs. Theresa M.	Asbury Park, N. J.	1906
de Garay, Adrian, M. D.	No. 4 Leon, Mexico City, Mex.	1904
[illegible]land, William, M. D.	Grand Rapids, Mich.	1907
[illegible], R., M. D.	San Luis Potosi, Mex.	1906
[illegible] Rio Lerma, M. D.	La Sta. Feres, 4, Puebla, Mex.	1907
[illegible] [illegible], M. D.	42 Olney Road, Norfolk, Va.	1907
*Dexter, F. P., M. D.	Brookline, Mass.	1901
Dixon, Lucas, M. D.	30 Central St., Newark, N. J.	1877
[illegible] Reyes, M. D.	Vera Cruz, Mex.	1906
Dickson, Dwight, M. D.	U. S. Navy, Portsmouth, N. H.	1905
[illegible] [illegible], M. D.	278 Montgomery St., Jersey City, N. J.	1905
Dodge, Wm. S., M. D.	151 Orchard St., Newark, N. J.	1900
[illegible], Samuel G., M. D.	Ardmore, Pa.	1905
*Dodge, Charles Wright	University of Rochester, Rochester, N. Y.	1901
*Dodge, Richard Bryant	1330 F St., N. W., Washington, D. C.	1905
*Donaldson, Washington	Birmingham, Ala.	1903
*Doyle, Maurice, M. D.	Bureau Animal Industry, Washington, D. C.	1900
Dorr, Alvah H., M. D.	Rosebank, N. Y.	1905
Douglas, Alexander Joseph, M. D.	Winnipeg, Manitoba	1903
*[illegible], [illegible] and C. E.	Main Street, Winnipeg, Manitoba	1906
*Dowd, Wm. D. S.	57 E. 96th St., New York, N. Y.	1906
Dowdy, Charles P., M. D.	Altoona, Pa.	1908
Downs, Joaquin L., M. D.	16 Trocadero St., Havana, Cuba	1906
*Downham, Frank K., M. D.	26th St. and First Ave., New York, N. Y.	1905
Draper, Samuel H., M. D.	12 Beacon St., Boston, Mass.	1873
[illegible], Lewis B., M. D.	312 Burke Building, Seattle, Wash.	1905
[illegible], Oscar Orlando	602 Carondelet St., New Orleans, La.	1902
[illegible]	[illegible] St. Paul, Minn.	1907
Earle, F. M., M. D.	Carberry, Manitoba	1901
*Eaton, Thomas Oliver	2251 Calumet Ave., Chicago, Ill.	1904
[illegible], [illegible], M. D.	[illegible] Health, Pittsburg, Pa.	1907
Eaton, L. V., M. D.	Springfield, Ill.	1907
*Eaton, W. E., M. D.	Glenolden, Pa.	1900
Eaton, Edmund, M. D.	1106 P St., N. W., Washington, D. C.	1902
*Eberman, J. W.	East Court and Martin Sts., Cincinnati, Ohio	1897
Eckles, Chas., M. D.	P. O. Box 454, Denver, Col.	1907
[illegible]	[illegible]	1907
*Edwards, Henry, M. D.	11 Maple St., Springfield, Mass.	1900
[illegible], [illegible], M. D.	[illegible] St., New Brunswick, N. J.	1907

* [illegible]

ENNIS, ROBT. BERRY.....87 E. Lake Street, Chicago, Ill. 1906
ENRIQUES Y TERRAZAS, JUAN, M. D.....Chihuahua, Mex. 1906
*ERNST, HAROLD C., M. D.....Harvard Medical School, Boston, Mass. 1899
ESCOBEDO, HIGINIO A., M. D.....3a de Mina 10, Mexico, D. F., Mex. 1906
ESPINOSA, ALBERTO, M. D.....2a de Allende 9, Pachuca, Hidalgo, Mex. 1906
EVANS, HENRY D.....Augusta, Maine. 1905
*EVANS, M. S.....Center and Craig Sts., Pittsburg, Pa. 1905
EXTON, JAMES A., M. D.....75 Beech St., Arlington, N. J. 1897
*EZEKIEL, EDWIN N.....806 W. Grace St., Richmond, Va. 1907

*FABELA, OCTAVINO GONZALEZ, M. D.....
10 de la Violeta, No. 6, Mexico, Mex 1901
FALERO, JUAN, D. D. S.....Tacuba 18, Mexico, D. F., Mex 1906
FARNHAM, EDWIN, M. D.....Cambridge, Mass. 1899
FARQUHAR, A. B., ESQ.....York, Pa. 1880
FERGUSON, F., M. D.....Hotel Rudolph, Atlantic City. 1892
FERNANDEZ JOSE P., M. D.....Mapimi, Durango, Mex. 1906
FINLAY, CARLOS JUAN, M. D.....128 Reina St., Havana, Cuba. 1902
FISHER, E. B., M. D.....Fredericton, N. B. 1901
FISHER, PROF. IRVING.....New Haven, Conn. 1906
FISHER, T. B., M. D.....Maple Avenue, Dallas, Texas. 1906
*FITZ-RANDOLPH, RAYMOND B., M. D...147 East State St., Trenton, N. J. 1905
FLICK, LAWRENCE F., M. D.....732 Pine St., Philadelphia, Pa. 1890
*FLESKEN, CHARLES F., D. V. M.....307 Fourth St., Minneapolis, Minn. 1904
*FORBES, F. B.....502 State House, Boston, Mass. 1905
*FOX, HERBERT, M. D.....4443 Spruce St., Philadelphia, Pa. 1907
FOX, ROBERT WILLIAM.....8th Ave., Calgary, Alberta. 1907
*FOOTE, CHARLES JENKINS, M. D.....26 Elm St., New Haven, Conn. 1895
FORWOOD, WILLIAM H., M. D....1425 Euclid Place, Washington, D. C. 1906
FRANCIS, CHARLES, C. E.....8 Masonic Temple, Davenport, Ia. 1906
*FRANKFORTER, GEORGE BELL..525 River Road, S. E., Minneapolis, Minn. 1906
*FREEMAN, ALLEN WEIR, M. D.....15 S. Third St., Richmond, Va. 1907
*FREEMAN, R. G., M. D.....205 West 57th St., New York, N. Y. 1899
FRIEDRICH, MARTIN, M. D.....684 Jennings Ave., Cleveland, Ohio. 1905
*FROST, WILLIAM DODGE, PH. D.....310 N. Bruen St., Madison, Wis. 1904
*FULLER, C. A.....Madison, Wis. 1905
FULLER, FRANK L., C. E.....12 Pearl Street, Boston, Mass. 1906
*FULLER, GEORGE W.....170 Broadway, New York, N. Y. 1892
*FULTON, JOHN S., M. D.....810 Colorado Bldg., Washington, D. C. 1897
FURNISS, HENRY W., M. D.....Port au Prince, Hayti. 1900

GABLE, ISAAC C., M. D.....26 South St., York, Pa. 1897
*GAGE, STEPHEN DEM.....Experiment Station, Lawrence, Mass. 1901
GARCIN, RAMON DAVID, M. D.....2618 E. Broad St., Richmond, Va. 1907
GARDUNO, ADRIAN, M. D.....Ocampo 5, Atzcapotzalco, D. F., Mex. 1906
GAVINO IGLESIAS, ANGEL, M. D.....Ortega 7, Mexico, D. F., Mex. 1906
GAYOL Y SOTO, FERNANDO, M. D..Santa Teresa 14, Mexico, D. F., Mex. 1906
GAYON, JOSE P., M. D.....
Estampa de Jesus Maria 7, Mexico, D. F., Mex. 1906

* Also members of Laboratory Section.

*Gerhmass, Adolph, M D	3816 Ellis St, Chicago, Ill	1886
[illegible] S L, M D	Forest, Ohio	1902
*Grasso Joseph M D	2a Dolores 429, Mexico, D F, Mex	1906
Gerhard Wm Paul, C E	33 Union Square West, New York, N Y	1880
Gerrish, Frederic H, M D	Portland, Me	1885
*Gerhard, S H, M D	Univ of Pa, Philadelphia, Pa	1900
Gomez Alvarez Manuel M D	Rebeldes 6, Mexico, D F, Mex	1906
*Goldberger Joseph M D	U S P H & M H S, Washington, D C	1906
Gerhard S S, M D	Mt Sinai Hospital, New York, N Y	1902
Gerhard, Geo W, M D	127 East Ave, Rochester, N Y	1900
Gonzalez Urrutia Jesus, M D	Portales de San Diego 15, Mexico, D F, Mex	1906
Gonzalez Garcia Vega Manuel M D	Puente de Monzon 7, Mexico, D F, Mex	1906
Gonzalez Vazquez Jesus M D	Acequia 24, Mexico, D F, Mex	1906
Gerhard E V, M D	68 Jamaica Ave, Flushing, N Y	1900
*Gerhard Mary L, M D	Dept of Health, New York, N Y	1905
Gerhard Wm C, M D, U S A	Ancon C Z	1901
*Gerhard Peter P	Brown University, Providence, R I	1899
[illegible]	[illegible]	[illegible]
*Gerhard George [illegible] M D	[illegible]	[illegible]
Gerhard H F, M D	Penacook, N H	1906
Gerhard Samuel M [illegible]	10 Westminster St, Providence, R I	1901
Gerhard Wm de M D	485 Jersey St, Buffalo, N Y	1902
[illegible]	[illegible]	[illegible]
[illegible]	Medellin 12, Mexico, D F, Mex	1906
Gerhard Edward M D	32 S Virginia Ave, Atlantic City, N J	1905
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Gerhard [illegible] M D	119 San Miguel St, Havana, Cuba	1902
Gerhard Reuben M D	73 W 58th St, New York, N Y	1904
*Gerhard Stanley S B	Lawrence, Mass	1905
Gerhard Ernesto A M D	Avenida Veinticinco de Julio Mex	1906

Hall, Jesse Mayo, M D	Mt Vernon, N Y	1892
Hall, Max M D	191 Peabody Ave, Memphis, Tenn	1892
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	9[illegible] Harrison Bldg, Cincinnati, Ohio	1905
*Hamilton Alice M D	State House, Boston, Mass	1901
*Hamilton [illegible] M D	[illegible]	[illegible]
Hamilton C V, M D	15 Pinckney St, Madison, Wis	1904
Hamilton [illegible] W C	17 Exchange Place, Jersey City, N J	1906
[illegible]	[illegible]	[illegible]
Hamilton Taylor, Ph D	Canton, Ohio	1905
Hamilton W A, M D	Alton, Ill	1903
Hamilton [illegible] M D	Burlington, Vt	1904

* [illegible]
[illegible]

HAYES, E. S., M. D.	630 3d Ave., Eau Claire, Wis.	1907
*HAZEN, ALLEN, C. E.	220 Broadway, New York, N. Y.	1892
HECKARD, MARTIN O., M. D.	2505 Magnolia Ave., Chicago, Ill	1907
HEIDES, B. VAN D.	703 Natchung Ave, Plainfield, N J	1907
HERSHEY, MILTON H.	Montreal, Que.	1903
HERING, RUDOLPH, C. E.	170 Broadway, New York, N. Y.	1878
HEROLD, H. C. H., M. D.	Newark, N. J.	1898
HILL, G. EVERETT, C. E.	156 Fifth Ave., New York, N. Y.	1897
*HILL, HIBBERT W., M. D.	Univ. of Minn., Minneapolis, Minn.	1896
HILL, JOHN EDW.	Brown Univ., Providence, R. I.	1902
HILL, JOHN W., C. E.	1st Nat. Bank Bldg., Cincinnati, Ohio.	1896
*HISS, PHILIP H., JR., M. D.	437 W. 59th St., New York, N. Y.	1899
*HITCHENS, A. PARKER	Glenolden, Pa.	1907
*HODENPYL, EUGENE, M. D.	437 W. 59th St., New York, N. Y.	1901
HODGETTS, CHARLES A., M. D.	Toronto, Ont.	1905
HOFFMAN, FREDERICK L.	761 Broad St., Newark, N. J.	1907
*HOFFMAN, WILLIAM EDWIN, JR., PH. D	15 S. Gay St., Baltimore, Md	1907
*HOLLIS, FREDERICK S.	Tufts Medical College, Boston, Mass	1902
HOLLISTER, L. EUGENE, M. D.	168 Clinton Ave., Newark, N. J.	1905
HOLTON, HENRY D., M. D.	Brattleboro, Vt.	1875
HORNE, WILLIAM DORSI, PH. D.	175 Park Ave, Yonkers, N Y.	1907
*HORTON ELMER G, M. D.	Columbus, Ohio.	1897
HOYO, JAVIER, M. D.	6a Morelos 6, Pachuca, Hidalgo, Mex.	1906
*HUDDLESTON, J. H., M. D.	126 W. 85th St., New York, N. Y.	1899
HUG EDWARD VICTOR M. D.	212-215 Century Block, Lorain, Ohio	1907
HUGHES, CHARLES HAMILTON, M. D.	384 Washington Boulevard, St Louis, Mo	1906
HUIG, JOAQUIN, M. D.	2a de Guerrero 22½, Mexico, D. F., Mex	1906
HULME, GEORGE B.	250 West 57th Street, New York, N Y	1906
HUNT, C. C., M. D.	Dixon, Ill.	1889
HUPP, HENRY M., M. D.	Supt. Johns Hopkins Hospital, Baltimore, Md.	1906
HURTY, JOHN N., M. D.	29 E. Second St., Indianapolis, Ind.	1896
HUTCHINSON, HENRY, M. D.	703 Germania Life Bldg., St. Paul, Minn.	1904
HYDE, CHARLES GILMAN.	Univ. of Calif., Berkeley, Calif.	1905
IGLESIAS, MANUEL S., M. D.	Veracruz, Mex.	1900
IRELAND, M. W., M. D.	U. S. Army, Washington, D. C.	1907
IRION, CLIFFORD HILL, M. D.	428 Lowerlin Street, New Orleans, La.	1906
†IRVING, PAUL S. A.	301 W. Grace St., Richmond, Va.	1907
*JACKSON, DANIEL D.	Flatbush Ave. and E. Parkway, Brooklyn, N. Y.	1899
JOHNSON, CHAS B., M. D.	Champaign, Ill.	1897
*JOHNSON, GEO. A.	170 Broadway, New York, N. Y.	1900
JOHNSON, H. L. E., M. D.	1821 Jefferson Place, Washington, D. C.	1903
JOHNSON, SAMUEL K., D. V. S.	969 6th Ave., New York, N. Y.	1906
JOHNSON, WM. S.	101 Tremont St., Boston, Mass.	1905
†JONES, C. HAMPSON, M. D.	City Hall Annex, Baltimore, Md.	1907
JONES, HEPER, M. D.	Memphis, Tenn.	1902

* Also members of Laboratory Section.

† Membership not completed.

*Jordan, Edwin O	University of Chicago, Chicago, Ill	1900
*Jordan, Harry E	835 Cairo St., Indianapolis, Ind.	1904
*Jordan, James O	30 Huntington Ave, Boston, Mass	1906
Jordan, Thomas, M D	Board of Health, Boston, Mass	1902
Kellerman, Karl Frederic	Bureau of Plant Industry, Washington, D C	[illegible]
Kellogg, J H, M D	Battle Creek, Mich	[illegible]
Kennedy, J F, M D	Des Moines, Iowa	[illegible]
[illegible] Thomas, M D	Woodstock, Vt	[illegible]
[illegible] M D	[illegible] Harper Ave, Detroit, Mich	[illegible]
K[illegible] B	147 College Ave, New Brunswick, N J	[illegible]
*K[illegible] E	912 Harrison Bldg, Columbus, Ohio	1905
*Kinnicutt, Leonard P, S D	Worcester, Mass	[illegible]
*K[illegible] J J, M D	1423 Clifton St, Washington, D C	[illegible]
*K[illegible] S S, M D	1510 Walnut St, Philadelphia, Pa	[illegible]
*Knowles, Morris, C E	Bureau of Filtration, Pittsburg, Pa	1901
[illegible] M D	[illegible]	[illegible]
Knox, S P B, M D	912 Anacapa, Santa Barbara, Cal	[illegible]
Knox, William F, M D	McKeesport, Pa	[illegible]
Kober, George M, M D	1600 T St, Washington, D C	[illegible]
K[illegible] M D	Covington, La	[illegible]
K[illegible]emann, H [illegible], M D	262 15th Ave, Newark, N J	1904
K[illegible], Emil C E	52 Broadway, New York, N Y	[illegible]
[illegible] M D	[illegible] Montreal, P Q	[illegible]
[illegible]	[illegible] Mex	[illegible]
[illegible]	[illegible] Mex	
[illegible]	[illegible] Mex	[illegible]
[illegible] M D		
[illegible]	[illegible] Mex	[illegible]
[illegible]	[illegible]	[illegible]
[illegible] P, M D	[illegible] San Lorenzo, Mexico, Mex	[illegible]
[illegible]	[illegible] N J	[illegible]
[illegible]	[illegible] Mass	[illegible]
[illegible]	U S [illegible] Washington, D C	[illegible]
[illegible]	[illegible] Mass	[illegible]
*[illegible] M D	[illegible]	[illegible]
*[illegible] M	[illegible]	[illegible]
[illegible]	[illegible] N Y	[illegible]
[illegible] M D	Raleigh, N C	[illegible]
[illegible] M D	[illegible] San Andres St, Mexico, Mex	[illegible]
[illegible]	[illegible] Urbana, Ill	[illegible]
[illegible]	[illegible] Ave, Des Moines, Iowa	[illegible]
[illegible]		
[illegible]	[illegible] D C	[illegible]
[illegible]	[illegible] Mex	[illegible]
[illegible]	[illegible] Mex	[illegible]
[illegible]	[illegible] Street [illegible] N J	[illegible]

[illegible]

Mirasta R. L., M. D.	12 West 102d St., New York, N. Y.	1904
Mitchell Henry, M. D.	Asbury Park, N. J.	1906
*Moore, Charles P.	Burlington, Vt.	1903
*Montaño, José, M. D.	2a de Yturbide No. 1, Mexico, D. F.	1891
Montjoy, C. C.	Middletown, Ohio	1907
Montgomery, E. H., M. D.	192 State St., Chicago, Ill.	1879
Montgomery, Frederick, M. D.	Ottawa, Ont.	1885
Moore, Carroll A.	Bellows Falls, Vt.	1904
Moore, Richard C., M. D.	312 Masonic Bldg., Omaha, Neb.	1904
*Moore, Veranus A., M. D.	Veterinary College, Ithaca, N. Y.	1890
Morales, José D. S., D. Par.	Orfila 30, Mexico, D. F., Mex.	1906
Morgan, James Pinckney, M. D.	1289 Broad St., Augusta, Ga.	1905
Morgan, Asa, M. D.	72 Monte St., Havana, Cuba	1904
Morgan, Dan, Jr.	70 Park Ave., New York, N. Y.	1905
Morris, Lewis M., M. D.	11 Court St., Brooklyn, N. Y.	1899
Morse, Wendell J.	Main and Wellington St., Waltham, Mass.	1905
*Mu[illegible], M. D.	113 Market St., Harrisburg, Pa.	1907
*[illegible]	West State St., [illegible], N. J.	1907
Mu[illegible]	812 So. 19th St., Philadelphia, Pa.	1896
*Mu[illegible], M. D.	Manila, P. I.	1906
Na[illegible], M. D.	167 West 120th St., New York, N. Y.	1876
Nava, Luis Muñoz, M. D.	Lacuba 4, Mexico, D. F., Mex.	1906
Nava, Mariano, M. D.	Hospicio 4, Mexico, D. F., Mex.	1906
Ne[illegible], M. D.	Cor. 11th & Phila., Philadelphia, Pa.	1907
*[illegible]	Middletown, Conn.	1907
Nelson, G. A., M. D.	New London, Minn.	1899
Nelson, [illegible], M. D.	2a Factoria 8, Mexico, D. F., Mex.	1906
Nelson, [illegible], M. D.	[illegible] Ave., [illegible]	1905
Nelson, [illegible], M. D.	2a del Factor 8, Mexico, D. F., Mex.	1906
Nesbitt, R. L., M. D.	5 York St., East, Savannah, Ga.	1901
*Nicholas, Geo. H. F., M. D.	[illegible]	
[illegible] St. Park Zoological Labs., New Museum, Cambridge, Eng.		1901
[illegible], M. D.	262 Hidalgo St., Guadalajara, Mexico	1906
[illegible]	[illegible] Park Row, New York, N. Y.	1907
Ochoterena, [illegible], M. D.	Mexico, D. F., Mex.	1906
Ortega, [illegible]	Isaac Mayorga 12, Mexico, D. F., Mex.	1907
Osgood, [illegible], M. D.	381 Beacon St., Boston, Mass.	1894
[illegible], M. D.	446 Madison Ave., St. Louis, Mo.	1907
Owens, [illegible]	Montclair, N. J.	1901
[illegible], M. D.	Owensboro, Ky.	1907
Pa[illegible], M. D.	224 W. 3rd St., Los Angeles, Cal.	1906
Pa[illegible], A. M. D.	601 Maison Blanche Bldg., New Orleans, La.	1902
*Pa[illegible], H. M. D.	115 W. 59th St., New York, N. Y.	1899
*P[illegible]	[illegible], Washington, D. C.	1901
[illegible]	[illegible]	1907

PARMELEE, CHAS. L.....136 Liberty St., New York, N. Y. 1899
PARRY, ELEANOR, M. D.....749 Madison Ave., New York, N. Y. 1901
PAZ, ERNESTO, M. D.....Mexico, D. F., Mex. 1906
*PEARSON, LEONARD, V. M. D.....3608 Pine St., Philadelphia, Pa. 1897
PEARSON, PROF. R. A.....Ithaca, N. Y. 1907
*PEASE, HERBERT D., M. D.....116 Washington Ave., Albany, N. Y. 1897
PECKHAM, WILLIAM D., M. D.....333½ Genesee St., Utica, N. Y. 1907
PELLETIER, P., M. D.....Sherbrooke, Que. 1902
PEON DEL VALLE, JUAN, M. D.....Sadi Carnot 21, Mexico, D. F., Mex. 1906
PERKINS, ALLEN J., M. D.....828 Kirby St., Lake Charles, La. 1906
*PERKINS, ROGER G., M. D.....1527 Euclid Ave., Cleveland, Ohio. 1902
PERRY, J. C., M. D.....U. S. P. H. and M. H. S., Ancon, C. Z. 1903
*PHELPS, EARLE B.....Mass. Inst. Tech., Boston, Mass. 1902
PORTER, EUGENE H., M. D.....181 75th St., New York, N. Y. 1906
PORTER, FRED BAKER.....Swift Fertilizer Works, Atlanta, Ga. 1906
*PORTER, JOHN LEWIS.....604 Carondelet St., New Orleans, La. 1902
PORTER, JOSEPH Y., M. D.....Jacksonville, Fla. 1878
†POTTS, CLYDE, C. E.....Plane St., Morristown, N. J. 1907
POWELL, THOMAS, M. D.....416 West 6th St., Los Angeles, Cal. 1903
POWERS, F. W., M. D.....522½ Commercial St., Waterloo, Iowa 1907
*PRATT GILBERT H.....State House, Providence, R. I. 1905
PRATT, R WINTHROP.....912 Harrison Bldg., Columbus, Ohio. 1905
*PRESCOTT, SAMUEL C.....Mass. Institute Technology, Boston, Mass. 1902
PRICE, MARSHALL LANGTON, M. D.....10 South St., Baltimore, Md. 1903
PROBASCO, NORMAN HAYES, M. D.....175 E. Front St., Plainfield, N. J. 1907
PROUST, C. O., M. D.....Columbus, Ohio 1886
*PRUDDEN T MITCHELL, M. D.....160 West 59th St., New York, N. Y. 1899
PRUNEDA, ALFONSO, M. D.....3a de Soto 4, Mexico, D. F., Mex. 1904
PUGA COLMENARES, MANUEL, M. D.....
2a de Mercaderes 8, Orizaba, Vera Cruz, Mex. 1906
PUTNAM, HELEN C, M. D.....127 Angell St., Providence, R. I. 1901

QUEVEDO Y ZUBIETA, SALVADOR, M. D.....
2a de San Francisco 3, Mexico, D. F., Mex. 1906

RAFFERTY, PETER PHILIP, M. D.....113 Monmouth St., Red Bank, N. J. 1907
RAMIREZ DE ARELLANO, NICOLAS, M. D.....
1a de Guerrero 11½, Mexico, D. F., Mex. 1906
RAMIREZ, LIBORIO, M. D.....San Pedro 2, Puebla, Puebla, Mex. 1906
RAMOS, JOSE, M. D.....Moneda 3, Mexico, D. F., Mex. 1906
*RAVENEL, M. P., M. D.....University of Wisconsin, Madison, Wis. 1897
RAYMOND, JOSEPH., M. D.....145 Willow St., Brooklyn, N. Y. 1882
REICHEL, JOHN, V. S.....39th and Spruce Sts., Philadelphia, Pa. 1907
*REID, DANIEL GRAISBERRY, M. B.....Edmonton, Alberta. 1907
RICHARDS, EDGAR.....60 Ayrault St., Newport, R. I. 1889
*RICHARDS, MRS. E. H.....Mass. Institute of Technology, Boston, Mass. 1888
RICHARDSON, MAJ. HENRY B., C. E.....New Orleans, La. 1880

* Also members of Laboratory Section.
† Membership not completed.

RICHARDSON, W. L., M. D.	225 Commonwealth Ave., Boston, Mass.	1878
*RICKARDS, BURT RANSOM, S. B.	739 Boylston St., Boston, Mass.	1901
RIVES, WILLIAM C., M. D.	1702 Rhode Island Ave., Washington, D. C.	1888
ROBERTS, CHARLES F., M. D.	250 W. 57th St., New York, N. Y.	1888
ROBERTS, JAMES, M. D.	City Hall, Hamilton, Ontario	1897
*ROBIN, ALBERT, M. D.	1223 Market St., Wilmington, Del.	1880
ROBINS, VERNON, M. D.	717 Second St., Louisville, Ky.	1904
*ROBINSON, PROF. FRANKLIN C.	Brunswick, Me.	1889
ROBINSON, JOHN FRANKLIN, M. D.	Manchester, N. H.	1894
ROGERS, ROY F., M. D.	St. John's Hospital, Springfield, Ills.	1906
ROMERO, ERASMO O., M. D.	Ozuluama, Vera Cruz, Mex.	1906
ROMERO, JOSE FRANCISCO, M. D.	Calle de la Amargura 7, Mexico, D. F. Mex.	1906
ROMERO, MANUEL, M. D.	San Lorenzo, Sinaloa, Mex.	1906
ROSEA, PEDRO, M. D.	Puerto Arista, Chiapas, Mex.	1906
ROSICHELLI, FELIX, M. D.	Jimenez, Chihuahua, Mex.	1906
[illegible]	[illegible], Market St., Parkersburg, W. Va.	1907
[illegible]	Pasadena, Cal.	1902
[illegible]	[illegible] and Lehigh Ave., Philadelphia, Pa.	1907
RUIZ, ESPINOSA, ALFONSO, M. D.	Calle de Adriana Vega 4, Mexico, D. F., Mex.	1906
RUIZ, RAMON, M. D.	Salvatierra, Guanajuato, Mex.	1906
*RUSSELL, H. L.	Madison, Wis.	1889
RUTAN, JAMES R.	140 Somerset St., Newark, N. J.	1906
RUTHERFORD, J. G., M. D.	Ottawa, Ont.	1902
SALINAS, JESUS M., M. D.	Leandro Valle 7, Mexico, D. F., Mex.	1906
SALINAS Y CARRO, ANTONIO, M. D.	3a del Pino 1, Mexico, D. F., Mex.	1906
SALINAS, JOSE LUIS, M. D.	3a de Soto 15, Mexico, D. F., Mex.	1906
SALVIN, LUTHER ROBINSON	Box 11, Katonah, N. Y.	1904
*[illegible]	Lawrence, Kan.	1907
SCHAEFFER, FRED LAWRENCE, M. D.	Bonnevain, Manitoba	1902
*[illegible]	U. S. P. H. & M. H. S., Washington, D. C.	1907
SCHOONOVER, WARREN, M. D.	115 E. 59th St., New York, N. Y.	1888
*SCHOOLEY, ELMER HOWE, M. D.	University of Missouri, Columbia, Mo.	1907
SEAMAN, LOUIS L., M. D.	247 Fifth Ave., New York, N. Y.	1891
*SEDGWICK, PROF. W. T.	491 Boylston St., Boston, Mass.	1900
*SEIP, [illegible]	107 Irving St., Rahway, N. J.	1907
SEPULVEDA, [illegible]	Mexico, D. F., Mex.	1906
SEPULVEDA, LORENZO, M. D.	Filisco 6, Mexico, D. F., Mex.	1906
SEYMOUR, ARTHUR H. [illegible]	476 Hudson Ave., Albany, N. Y.	1907
SHAW, THOMAS B., M. D.	132 Warren St., Boston, Mass.	1900
SHAW, [illegible], M. D.	Lorneville, Ontario	1907
SHERMAN, WILLIS D. [illegible], E.	613 Nasby Bldg., Toledo, Ohio	1904
[illegible]	85 N. High St., Columbus, Ohio	1900
[illegible]	Main St., Winnipeg, Man.	1906
SKINNER, LOUIS D. [illegible], M. D.	Columbia Hospital, Washington, D. C.	1906
*[illegible]	278 Yates St., Albany, N. Y.	1906

[illegible] Section
[illegible]

*Slack, Francis H., M. D.	739 Bolyston St., Boston, Mass.	1905
Smersh, F. M., M. D.	Owatonna, Minn.	1899
Smith, Frederick W., M. D.	606 S. Salina St., Syracuse, N. Y.	1896
*Smith, Herbert E., M. D.	Med. Dept. Yale Univ., New Haven, Conn.	1899
Smith, Joseph Rome, M. D.	2135 Spruce St., Philadelphia, Pa.	1902
*Smith, Theobald, M. D.	Forest Hills, Boston, Mass.	1899
Smith, Wm. F., M. D.	Orient, L. I.	1901
Smock, Prof. John C.	Trenton, N. J.	1899
*Soper, Geo. A., Ph. D.	29 Broadway, New York, N. Y.	1900
Soriano, Manuel S., M. D.	5a de Mina 411, Mexico, D. F., Mex.	1906
Smith, David S.	145 E. Hanover St., Trenton, N. J	1907
Spaulding, Heman, M. D.	1354 Vernon Ave., Chicago, Ill.	1900
Spaulding, Henry S.	U. S. G. S., Washington, D. C.	1906
Spencer, Leonard E., M. D.	Wausau, Wis.	1903
*Stabler, Herman	U. S. Geol. Survey, Washington, D. C.	1905
Stanton, Byron, M. D.	931 Dayton St., Cincinnati, Ohio.	1889
*Stengel, Alfred, M. D.	Pepper Laboratory, Philadelphia, Pa.	1899
*Sternberg, Geo. M., M. D.	2144 California Ave., Washington, D. C.	1874
Steventon, G. C.	City Hall, Youngstown, Ohio.	1907
Stiles, Charles Wardell, Ph. D.,	25th and E Sts., N. W., Washington, D. C.	1904
*Stokes, Wm. R., M. D.	City Hall Annex, Baltimore, Md.	1899
*Stone, Bingham H., M. D.	Burlington, Vt.	1900
Strauss, Nathan	Broadway and 34th St., New York, N. Y.	1903
Stubbs, Alfred Doland, M. D.	Coatzacoalcos, Vera Cruz, Mex	1906
*Swarts, Gardner Taber, M. D.	Providence, R. I.	1894
*Sweetser, Albert R., M. D.	414 E. 12th St., Eugene, Oregon.	1905
Sylvester, Ira W., C. E.	Alexandria, La.	1903
Talbot, Marion	University of Chicago, Chicago, Ill.	1893
Terraza, Ramon, M. D.	17 Santa Clara, Mexico, D. F., Mex.	1907
Thaira, Blas, M. D.	Chihuahua, Mex	1906
*Thomas, James Bosley, M. D.	920 N. Carrollton Ave., Baltimore, Md	1907
Thomas, John Newton, M. D.	Quarantine, La.	1903
Thurlow, Leon R., S. E.	149 North Ave., Plainfield, N. J	1907
Torralbas, Frederick, M. D.	23 Compostela St., Havana, Cuba.	1904
Totman, David M., M. D.	303 Montgomery St., Syracuse, N. Y.	1907
Townsend, Joseph H., M. D.	39 College St., New Haven, Conn.	1901
Tucker, Fred A., M. D.	Noblesville, Ind.	1905
Tucker, Henry, M. D.	10 Elliott St., Brattleboro, Vermont	1907
Tucker, William C., S. E.	156 Fifth Ave., New York, N. Y.	1903
Turnbull, Thomas, M. D.	935 Western Ave., Allegheny, Pa	1897
Underwood, Wm. Lyman	Belmont, Mass.	1902
Uribe, Alejandro, M. D.	1a de Mesones 19, Mexico, D. F., Mex.	1906
Urrutia, Joaquin, M. D.	La Fragua 14, Puebla, Puebla, Mex	1906
Utley, Edward R., M. D.	Newton, Mass.	1898
Valdes, Ulisses, M. D.	San Juan de Dios 267, Mexico, Mex	1903

* Member of the Laboratory Section

VALENTINE, FRED C, M D	31 W 61st St, New York, N Y	1906
VALLE, FRANCISCO, M D	Ga de la Magnolia 621, Mexico, D F, Mex	1906
VAN WINKLE, WATSON, M E	564 Franklin St, Buffalo, N Y	1907
[illegible] M D	Chapultepec 23, Mexico, D F, Mex	1906
[illegible] M D	Ebano 18, Mexico, D F, Mex	1906
[illegible] M D	Londres 1, Mexico, D F, Mex	1906
[illegible] M D	[illegible] Rogers Mexico, D F, Mex	1906
VARONA Y [illegible], JOSE LORIS, M D	89 Galiano St, Havana, Cuba	1906
[illegible] M D	Morelia 747, Mexico, D F, Mex	1907
[illegible]	42 Main St, Gloversville, N Y	1904
[illegible]	17 W 74th St, Manhattan, N Y	1907
WARD, JAMES G, M D	318 N 21st St, Millville, N J	1907
[illegible] P, M D	Cambridge, Mass	1906
WARNER, FRANK, M D	Columbus, Ohio	1904
[illegible] A, M D	Concord, N H	1901
*[illegible]	Library of Congress, Washington, D C	1906
[illegible]	[illegible] 11 Ave, Manhattan, N Y	1907
[illegible] M D	U S Navy, Chelsea, Mass	1906
*[illegible] E, M D	Minneapolis, Minn	1907
*[illegible]	14 Beacon St, Boston, Mass	1906
*[illegible]	D Whiting & Sons, Boston, Mass	1905
*[illegible]	220 Broadway, New York, N Y	1904
[illegible]	130 Water St, New York, N Y	1904
[illegible]	130 Water St, New York, N Y	1904
*[illegible] M D	[illegible] Richmond, Va	1907
[illegible]	105 N Eutaw St, Baltimore, Md	1907
[illegible]	Bureau of Plant Industry, Washington, D C	1907
[illegible]	New Haven, Conn	1906
WHITON, WM J, M D	300 Second St, Watertown, Wis	1904
[illegible] M D	Cosmos Club, Washington, D C	1907
*WILEY, H W	1814 19th St, N W, Washington, D C	1901
*WILLIAMS, ANNA W, M D	312 71st St, W, New York, N Y	1904
*WILLIAMS, ESSEX G, M D	111 N 4th St, Richmond, Va	1905
*[illegible] M D	24 High St, Buffalo, N Y	1907
[illegible]	[illegible] 5th St, Watervliet, N Y	1906
[illegible] M	4 Joy St, Boston, Mass	1905
*[illegible]	157 Walnut St, Brookline, Mass	1902
WILSON, WILLIAM N, M D	Indianapolis, Ind	1901
[illegible] W S F	Dept of Health, Harrisburg, Pa	1906
[illegible] M	River Ave, Winnipeg, Man	1906
[illegible]	[illegible]	
[illegible] M D	210 Rochester Terrace, Port Richmond, N Y	1907
[illegible] P	108 Powell Ave, Evansville, Ind	1900
[illegible] Homer	Mass Inst of Technology, Boston, Mass	1888
[illegible] GEN A A M D, U S A	Princeton, N J	1876

* [illegible] Laboratory Section
† [illegible] deceased

WOODWARD, R. M., M. D.	P. H. M. H. S., Washington, D. C.	1901
WOODWARD, WILLIAM C., M. D.	Washington, D. C.	1896
WRIGHT, FRANK W., M. D.	48 Pearl St., New Haven, Conn.	1889
WRIGHT, JOHN W., M. D.	Erie, Pa	1897
WYMAN, WALTER, M. D.	P. H. and M. H. S., Washington, D. C.	1884
YOUNG, MRS. CARRIE B.	604 5th Ave., Asbury Park, N. J.	1906
YOUNG, A. G., M. D.	Augusta, Maine.	1885
ZARRAGA, FERNANDO, M. D.	2a de Iturbide 5, Mexico, D. F., Mex.	1906
ZIMMERMAN, C. P.	291 Market St., Newark, N. J	1904

HONORARY MEMBERS.

Ex-President GROVER CLEVELAND	Princeton, N. J.	1885
J. B. RUSSELL, M. D., LL. D.	Glasgow, Scotland.	1886
MRS. ELIZABETH THOMPSON	New York, N. Y.	1887
President PORFIRIO DIAZ	Mexico, Mex.	1892

LIFE MEMBER.

HENRY LOMB	Rochester, N. Y.	1884

FOREIGN MEMBERS.

PRECIADO ALFONSO, M. D.	Panama, Panama.	1904
MILLS, DUDLEY A.	Lt. Col., Royal Eng., Davenport, Eng	1905

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AGUAYO, LUIS.....Juan Manuel 12, Mexico City, D. F., Mex.
ALBERT, HENRY, M. D.....221 S. Lucas St., Iowa City, Iowa.
†ALLEN, JOHN K.....49-53 North Jefferson St., Chicago, Ill.
ALLEN, M. K., M. D.....321 Broadway, Louisville, Ky.
ATHERHOLT, GEORGE W.....517 City Hall, Philadelphia, Pa.

BASS, FREDERIC HERBERT, C. E.....116 Beacon St., Minneapolis, Minn.
BATT, WILMER R., M. D.....1620 State St., Harrisburg, Pa.
BEAGLE, FENIMORE D.....Dept. of Health, Albany, N. Y.
BEATTY, HAMILTON KELLEY, M. D....220 W. North Av., Allegheny, Pa
*BELBE, WARD L., V. S.....1315 Cleveland Av., St. Anthony Park, Minn.
BEEMAN, MILTON IRA, M. D.....Newburgh, Ontario.
†BEERS, WILLIAM HERBERT.....Cor. Laurel and Gist Sts., Columbia, S. C.
BELL FREDERIC D .....39-41 West 38th St., New York, N. Y.
*BIRGE, EDWARD GRANT.....Walbrook Testing Station, Baltimore, Md.
BLUE, ARCHIBALD.....Census Commissioner, Ottawa, Ontario.
*BOWLES, JAMES T. B.....635 State St., Madison, Wis.
BROWN ROBERT HUSE, C. E.....21 West 127th St., New York, N. Y.
BRUMBY, WILLIAM McDUFFIE, M. D.....Austin, Texas.
BURDELL, WILLIAM JAMES, M. D.....Lugoff, S. C.
BURKE, CHARLES JAMES, M. D.....969 Sixth Av., New York, N. Y.
BYRD, HIRAM, M. D.....Sixth Street, Jacksonville, Florida
BYRNE SYLVESTER J.....375 State St., Brooklyn, N. Y.

CAMPBELL, ROBERT, M. D.....374 Fulton St., Jamaica, N. Y.
CARTER, CHARLES A., M. D.....City Hall, Indianapolis, Ind.
COLE, HILLS, M. D. .....1748 Broadway, New York, N. Y.
*CONN, H. W., M. D.....Middletown, Conn.
*CRISPELL, CHAS. W., M. D.....60 West Chestnut St., Kingston, N. Y.
CRUM, FREDERICK STEPHEN.....751 Clifton Ave., Newark, N. J.

DARLINGTON, THOMAS, M. D.....48 59th St., New York, N. Y.
DELANO, WILLIAM, M. D.....Grand Rapids, Mich.
DEL RIO, ISAAC, M. D.....la Sta Feres, 4, Puebla, Mex.
†DEWITT, GEORGE E., M. D.....Health Officer, Wolfville, N. S.
DOWNEY, HENRY ROLFE, M. D.....42 Olney Road, Norfolk, Va.

EASTON, CHRISTOPHER.....Capitol Bldg., St. Paul, Minn.
EDWARDS, JAMES F., M. D.....Bureau of Health, Pittsburg, Pa.
EMERSON, CHARLES ALVIN, JR., S. E..6th & Lorman Sts., Baltimore, Md.
ENGLISH, DAVID C., M. D.....363 George St., New Brunswick, N. J.
*EZEKIEL, EDWIN N.....806 W. Grace St., Richmond, Va.

* Also members of Laboratory Section.
† Membership not completed.

*Fox, Herbert, M D	4443 Spruce St, Philadelphia, Pa
Fox, Robert William	[illegible]th Ave, Calgary, Alberta
*Freeman, Allen Weir, M D	15 S Third St, Richmond, Va
Garcia Ramos David, M D	2618 E Broad St, Richmond, Va
Grow Franklin C, M D	849 Humboldt Parkway, Buffalo, N Y
*Grandy Charles Bolton, M D	101 Freemason St, Norfolk, Va
Gerlach William Henry, M D	960 Sixth Ave, New York, N Y
Hall William Robert, M D	Charlottetown, Ontario
*Hammond Frederick Snyder, M D	State Hospital, Trenton, N J
Hanson William Clinton, M D	46 Gray St, Cambridge, Mass
Harding Louis	12 Chestnut St, Kearny, Newark, N J
Hayes F S, M D	630 3d Ave, Eau Claire, Wis
Hazard Marion O, M D	2505 Magnolia Ave, Chicago, Ill
Hess B Van D	703 Watchung Ave, Plainfield, N J
*Hopkins A Parker	Glenolden, Pa
Hopkins Frederick L	761 Broad St, Newark, N J
*Hopkins William Edwin, Jr, Ph D	15 S Gay St, Baltimore, Md
Horne William Dodge, Ph D	175 Park Ave, Yonkers, N Y
Howe Edward Victor, M D	212 215 Century Block, Lorain, Ohio
Ireland M W, M D	U S Army, Washington, D C
Jones Paul [illegible]	301 W Grace St, Richmond, Va
*Jones C Hampson, M D	City Hall Annex, Baltimore, Md
Kellerman Karl Frederic	Bureau of Plant Industry, Washington, D C
Kidd Thomas E, M D	Woodstock, Vt
Kidder Geo L, M D	168 Harper Ave, Detroit, Mich
Lee Richard S [illegible] F	Corriveau Bldg, Montreal, Que
*Lewis Dwight M	New Haven, Conn
Lewis F Park, M D	454 Franklin St, Buffalo, N Y
*Longden Jesse Morris	Univ of Ill, Urbana, Ill
McRae Henry Clinton	941 N Broadway, Baltimore, Md
Mellon I G, M D	441 Sixth St, Pittsburg, Pa
*Mitchell Murdock B, M D	413 Market St, Harrisburg, Pa
*Mumford John V	W State St, Trenton, N J
*Nicholson Jamd Andrew	Middletown, Conn
Pfaff Arthur L, M D	1262 Boston Road, New York, N Y
Ocampo Paul Carlos	Juan Manuel 12, Mexico D F, Mex
*Pearman David R, M D	4048 Maple Ave, St Louis, Mo
Palmer Darwin G, M D	Geneva, Ohio
*Pattee Jesse V	1156 Hunter St, Columbus, Ohio

* Associate Agricultural Laboratory Section
† Membership not completed.

[illegible]

*Membership not [illegible]
*Also members of [illegible]

Richardson, W. L., M. D.	225 Commonwealth Ave., Boston, Mass.	1876
*Richards, Ellen Swallow, S. B.	539 Boylston St., Boston, Mass.	1891
Rives, William C., M. D.	1702 Rhode Island Ave., Washington, D. C.	1895
Roberts, Charles F., M. D.	250 W. 57th St., New York, N. Y.	1892
Roberts, James, M. D.	City Hall, Hamilton, Ontario	1897
*Robin, Albert, M. D.	1223 Market St., Wilmington, Del.	1880
Robins, Virgil, M. D.	717 Second St., Louisville, Ky.	1904
*Robinson, Percy Franklin, C.	Brunswick, Me.	1898
Robinson, John Franklin, M. D.	Manchester, N. H.	1894
Rood, Ruth, M. D.	St. John's Hospital, Springfield, Ills.	1906
Rubio, Leandro, M. D.	Orizhama, Vera Cruz, Mex.	1906
Ruiz, José Francisco, M. D.	Ladera Amargura 7, Mexico, D. F., Mex.	1906
Ruelas, Manuel, M. D.	San Lorenzo, Sinaloa, Mex.	1906
Ruiz, Pedro, M. D.	Puerto Arista, Chiapas, Mex.	1906
Ruiz, Guillermo, M. D.	Jimenez, Chihuahua, Mex.	1906
[illegible], M. D.	[illegible], Market St., Parkersburg, W. Va.	1907
[illegible], M. D.	Pasadena, Cal.	1904
[illegible], M. D.	[illegible], Philadelphia, Pa.	1907
Ruiz, Ignacio, Alfonso, M. D.	Calle 2a. Alfonso Vega 4, Mexico, D. F., Mex.	1906
Ruiz, Ignacio, M. D.	Salvatierra, Guanajuato, Mex.	1906
*Russell, H. L.	Madison, Wis.	1898
Ryan, James R.	140 Somerset St., Newark, N. J.	1905
Rutherford, J. G., M. D.	Ottawa, Ont.	1902

Sánchez, José M., M. D.	Leandro Valle 7, Mexico, D. F., Mex.	1906
Sánchez, Carlos Antonio, M. D.	3a del Pino 1, Mexico, D. F., Mex.	1906
Sánchez, José Ignacio, M. D.	3a de Soto 15, Mexico, D. F., Mex.	1906
Sanchez, Emilio Rodriguez	Box 11, Katonah, N. Y.	1906
Sanford, [illegible]	Lawrence, Kan.	1907
Sanderson, Felix Lawrence, M. D.	Boissevain, Manitoba	1902
*Sawtelle, [illegible] W., U. S. P. H. & M. H. S.	Washington, D. C.	1907
Schoenfeld, Warren, M. D.	115 E. 59th St., New York, N. Y.	1905
Schuyler, [illegible], M. D.	University of Missouri, Columbia, Mo.	1907
Seaman, Louis L., M. D.	247 Fifth Ave., New York, N. Y.	1891
*Seaver, Percy W.	491 Boylston St., Boston, Mass.	1900
Seeley, [illegible] W., M. D.	[illegible] Prairie St., Rahway, N. J.	1907
Segura, [illegible]	Mexico, D. F., Mex.	1906
Segura, [illegible], M. D.	Ejercito, Mexico, D. F., Mex.	1906
Sewall, [illegible]	[illegible] Lark St., Albany, N. Y.	1907
Shaw, Thomas E., M. D.	132 Warren St., Boston, Mass.	1900
Shaw, [illegible], M. D.	[illegible], Ontario	1907
Sherman, Wm. [illegible] F.	613 Neeley Bldg., Toledo, Ohio	1906
Sherman, [illegible]	78 N. High St., Columbus, Ohio	1900
Shore, Wm. Alex., M. D.	Main St., Winnipeg, Man.	1906
Shrady, [illegible], M. D.	Columbia Hospital, Washington, D. C.	1905
*Sibley, [illegible]	278 Yates St., Albany, N. Y.	1906

*Slack, Francis H., M. D.	739 Bolyston St., Boston, Mass	1905
Smersh, F. M., M. D.	Owatonna, Minn.	1899
Smith, Frederick W., M. D.	606 S. Salina St., Syracuse, N. Y.	1896
*Smith, Herbert E., M. D.	Med. Dept. Yale Univ., New Haven, Conn.	1899
Smith, Joseph Rome, M. D.	2135 Spruce St., Philadelphia, Pa.	1902
*Smith, Theobald, M. D.	Forest Hills, Boston, Mass.	1899
Smith, Wm. F., M. D.	Orient, L. I.	1901
Smock, Prof. John C.	Trenton, N. J.	1899
*Soper, Geo. A., Ph. D.	29 Broadway, New York, N. Y	1900
Soriano, Manuel S., M. D.	5a de Mina 411, Mexico, D. F., Mex	1906
Smith, David S.	145 E. Hanover St., Trenton, N. J	1907
Spalding, Heman, M. D.	1354 Vernon Ave., Chicago, Ill	1900
Spalding, Henry S.	U. S. G. S., Washington, D. C	1906
Spencer, Leonard E., M. D.	Wausau, Wis.	1903
*Stabler, Herman	U. S. Geol. Survey, Washington, D. C	1906
Stanton, Byron, M. D.	931 Dayton St., Cincinnati, Ohio.	1889
*Stengel, Alfred, M. D.	Pepper Laboratory, Philadelphia, Pa.	1899
*Sternberg, Geo. M., M. D.	2144 California Ave., Washington, D. C.	1874
Stevenson, G. C.	City Hall, Youngstown, Ohio	1907
Stiles, Charles Wardell, Ph. D.,	25th and E Sts., N. W., Washington, D. C	1904
*Stokes, Wm. R., M. D.	City Hall Annex, Baltimore, Md	1899
*Stone, Bingham H., M. D.	Burlington, Vt	1900
Strauss, Nathan.	Broadway and 34th St., New York, N. Y	1903
Stucky, Alfred Doland, M. D.	Coatzacoalcos, Vera Cruz, Mex	1906
*Swarts, Gardner Taber, M. D.	Providence, R. I	1894
*Sweetser, Albert R., M. D.	414 E. 12th St., Eugene, Oregon	1905
Sylvester, Ira W., C. E.	Alexandria, La	1903
Talbot, Marion.	University of Chicago, Chicago, Ill.	1893
Tevraza, Ramon, M. D.	17 Santa Clara, Mexico, D. F., Mex	1907
Theiras, Blas, M. D.	Chihuahua, Mex	1906
*Thomas, James Bosley, M. D.	920 N. Carrollton Ave., Baltimore, Md	1907
Thomas, John Newton, M. D.	Quarantine, La.	1903
Thurlow, Leon R., S. E.	149 North Ave., Plainfield, N. J	1907
Torralbas, Frederick, M. D.	23 Compostela St., Havana, Cuba.	1904
Totman, David M., M. D.	303 Montgomery St., Syracuse, N. Y	1907
Townsend, Joseph H., M. D.	39 College St., New Haven, Conn	1901
Tucker, Fred A., M. D.	Noblesville, Ind	1905
Tucker, Henry, M. D.	10 Elliot St., Brattleboro, Vermont	1907
Tucker, William C., S. E.	156 Fifth Ave., New York, N. Y.	1903
Turnbull, Thomas, M. D.	835 Western Ave., Allegheny, Pa	1907
Underwood, Wm. Lyman	Belmont, Mass	1902
Ureta, Alejandro, M. D.	Ia de Mesones 19, Mexico, D. F., Mex	1906
Urrutia, Joaquin, M. D.	La Fragua 14, Puebla, Puebla, Mex	1906
Utley, Edward R., M. D.	Newton, Mass.	1898
Valdes, Ulisses, M. D.	San Juan de Dios 267, Mexico, Mex	1903

* Member of the Laboratory Section

Valentine, Lizzie C., M.D.	31 W. 61st St., New York, N. Y.	1896
Vallejo, Francisco, M.D.	6a de la Magnolia 621, Mexico, D. F., Mex.	1906
Van Winkle, Walter, M.D.	564 Franklin St., Buffalo, N. Y.	1907
[illegible], M.D.	Guatemala 23, Mexico, D. F., Mex.	1906
[illegible], M.D.	Ebro 48, Mex., D. F., Mex.	1906
[illegible], M.D.	Londres 1, Mexico, D. F., Mex.	1906
[illegible], M.D.	Plaza de la Regenta, Mex., D. F., Mex.	[illegible]
Vidaurreta, José Lopez, M.D.	89 Galiano St., Havana, Cuba	1904
[illegible], M.D.	Marsella 737, Mexico, D. F., Mex.	1906
[illegible]	42 Main St., Gloversville, N. Y.	1904
[illegible]	67 W. [illegible], N. Y.	[illegible]
Ward, James G., M.D.	318 N. 21st St., Millville, N. J.	1907
[illegible], M.D.	Cambridge, Mass.	1880
Wards, Evans, M.D.	Columbus, Ohio	1909
[illegible], M.D.	Concord, N. H.	1901
*[illegible]	Pierce-Arrow Motor Car Co., Buffalo, N. Y.	1906
[illegible]	[illegible]	[illegible]
[illegible], M.D.	U. S. Navy, Chelsea, Mass.	1906
*[illegible], M.D.	Minneapolis, Minn.	1897
*[illegible]	14 Beacon St., Boston, Mass.	1899
*[illegible]	D. Whiting & Sons, Boston, Mass.	1903
*[illegible]	220 Broadway, New York, N. Y.	1909
[illegible]	130 Water St., New York, N. Y.	1909
[illegible]	130 Water St., New York, N. Y.	1908
[illegible], M.D.	[illegible]	[illegible]
[illegible]	105 N. [illegible] St., [illegible], Md.	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	New Haven, Conn.	1901
[illegible], M.D.	500 Second St., Watertown, Wis.	1904
[illegible], M.D.	[illegible]	[illegible]
*[illegible]	1314 10th St., N. W., Washington, D. C.	1901
*[illegible], M.D.	302 71st St., W., New York, N. Y.	1904
*[illegible], M.D.	111 N. 4th St., Richmond, Va.	1906
*[illegible], M.D.	24 High St., Buffalo, N. Y.	1901
[illegible]	[illegible]	[illegible]
[illegible]	4 Joy St., Boston, Mass.	1906
*[illegible]	237 Walnut St., Brookline, Mass.	1907
[illegible], M.D.	Indianapolis, Ind.	1901
[illegible]	Dept. of Health, Harrisburg, Pa.	1904
[illegible]	River Ave., Winnipeg, Man.	1906
[illegible], M.D.	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Wood, Myra C., P.	1st Powell Ave., Evansville, Ind.	1909
[illegible], Homer	Mass. Inst. of Technology, Boston, Mass.	1886
[illegible], A. A., M.D., U. S. A.	Princeton, N. J.	1876

[illegible]
[illegible]

WOODWARD, R. M., M. D.	P. H. M. H. S., Washington, D. C.	1901
WOODWARD, WILLIAM C., M. D.	Washington, D. C.	1896
WRIGHT, FRANK W., M. D.	48 Pearl St., New Haven, Conn	1889
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YOUNG, A. G., M. D.	Augusta, Maine.	1885
ZARRAGA, FERNANDO, M. D.	2a de Iturbide 5, Mexico, D. F., Mex.	1906
ZIMMERMAN, C. P.	291 Market St., Newark, N. J	1904

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MRS ELIZABETH THOMPSON	New York, N. Y.	1887
President PORFIRIO DIAZ	Mexico, Mex.	1892

LIFE MEMBER.

HENRY LOMB	Rochester, N. Y.	1884

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MILLS, DUDLEY A	Lt. Col., Royal Eng., Davenport, Eng	1905

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Public Library	St. Louis, Mo.
Seattle Public Library	Seattle, Wash.
Syracuse Public Library	Syracuse, N. Y.
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University of Wisconsin Library	Madison, Wis.
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ALBERT, HENRY, M. D.....221 S. Lucas St., Iowa City, Iowa.
†ALLEN, JOHN K.....49-53 North Jefferson St., Chicago, Ill.
ALLEN, M. K., M. D.....321 Broadway, Louisville, Ky.
ATHERHOLT, GEORGE W.....517 City Hall, Philadelphia, Pa.

BASS, FREDERIC HERBERT, C. E.....116 Beacon St., Minneapolis, Minn.
BATT, WILMER R., M. D.....1620 State St., Harrisburg, Pa.
BEAGLE, FENIMORE D.....Dept. of Health, Albany, N. Y.
BEATTY, HAMILTON KELLEY, M. D....220 W. North Av., Allegheny, Pa.
*BEEBE, WARD L., V. S.....1315 Cleveland Av., St. Anthony Park, Minn.
BEEMAN, MILTON IRA, M. D.....Newburgh, Ontario.
†BEERS, WILLIAM HERBERT.....Cor. Laurel and Gist Sts., Columbia, S. C.
BELL, FREDERIC D.....39-41 West 38th St., New York, N. Y.
*BIRGE, EDWARD GRANT.....Walbrook Testing Station, Baltimore, Md.
BLUE, ARCHIBALD.....Census Commissioner, Ottawa, Ontario.
*BOWLES, JAMES T. B.....635 State St., Madison, Wis.
BROWN, ROBERT HUSE, C. E.....21 West 127th St., New York, N. Y.
BRUMBY, WILLIAM MCDUFFIE, M. D.....Austin, Texas.
BURDELL, WILLIAM JAMES, M. D.....Lugoff, S. C.
BURKE, CHARLES JAMES, M. D.....969 Sixth Av., New York, N. Y.
BYRD, HIRAM, M. D.....Sixth Street, Jacksonville, Florida
BYRNE, SYLVESTER J.....375 State St., Brooklyn, N. Y.

CAMPBELL, ROBERT, M. D.....374 Fulton St., Jamaica, N. Y.
CARTER, CHARLES A., M. D.....City Hall, Indianapolis, Ind.
COLE, HILLS, M. D.....1748 Broadway, New York, N. Y.
*CONN, H. W., M. D.....Middletown, Conn.
*CRISPELL, CHAS. W., M. D.....60 West Chestnut St., Kingston, N. Y.
CRUM, FREDERICK STEPHEN.....751 Clifton Ave., Newark, N. J.

DARLINGTON, THOMAS, M. D.....48 59th St., New York, N. Y.
DELANO, WILLIAM, M. D.....Grand Rapids, Mich.
DEL RIO ISAAC, M. D.....la Sta Feres, 4, Puebla, Mex.
†DEWITT GEORGE E., M. D.....Health Officer, Wolfville, N. S.
DUPUY, HENRY ROLFE, M. D.....42 Olney Road, Norfolk, Va.

EASTON, CHRISTOPHER.....Capitol Bldg., St. Paul, Minn.
EDWARDS, JAMES F., M. D.....Bureau of Health, Pittsburg, Pa.
EMERSON, CHARLES ALVIN, JR., S. E..6th & Lorman Sts., Baltimore, Md.
ENGLISH, DAVID C., M. D.....363 George St., New Brunswick, N. J.
*EZEKIEL, EDWIN N.....806 W. Grace St., Richmond, Va.

* Also members of Laboratory Section.
† Membership not completed.

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CONNECTICUT.

The Annual Sanitary Conference of the Health Officials of Connecticut is held under the auspices of the State Board of Health

INDIANA.

There is no voluntary State Sanitary Association. There are held under the auspices of the State Board of Health two health officers' schools annually. In June the school for county and city health officers is held. In December the health officers' school for town health officers, is held.

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The State Board of Health has an annual conference with county and municipal health officers.

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MICHIGAN

Sanitary conventions held one or more times each year, at different towns in the State

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An annual Sanitary Conference is held each year under the auspices of the State Health Department

OHIO

Joint meetings of state and local boards of health held each year President and Secretary of State Board of Health, *ex officio*, officers

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WYOMING.

A conference of members of the State Board of Health and County Health Officers is held each year.

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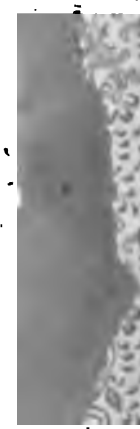

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