

# Reports of the Delegations to the Seventh Pan American Sanitary Conference

## REPORT OF THE DELEGATION OF THE ARGENTINE REPUBLIC

### THE SANITARY CONDITION OF THE COUNTRY AND THE PROGRESS EFFECTED THERE SINCE THE LAST CONFERENCE

Mr. Chairman, Messrs. Delegates: Although the Delegates have received a pamphlet entitled "*Departamento Nacional de Higiene—Principales innovaciones y ampliaciones*", the Delegation of the Argentine Republic deems it desirable to summarize in a brief account not only those innovations and reforms which have been effected since the former meeting in Montevideo down to the present date, but also the chief data of importance regarding the sanitary condition and the transmissible diseases of that country.

We shall do this in a very condensed form in order that the paper may be included in the appendix of the proceedings of this Conference.

### I

The greater part of these reforms and innovations have been effected since August, 1923, when the new direction of the National Department of Hygiene, in charge of one of us (Aráoz Alfaro), deemed it advisable to modify and expand the existing organization. The reorganization, however, has not been found possible in the measure in which it was desired, because from that time down to the present, it has not been possible to obtain a sufficiently thorough study—and the corresponding reform—of the Budget of expenses of the Nation which it is hoped will be secured at the present time and put into effect next year.

For this reason the increases have been limited to such as could be made by the Executive Power of the Nation—on the suggestion of the Department—within the limits of a few general items which fortunately existed in the present Budget under various heads.

It is proper to observe in this place that, in view of the federal form of government of the Argentine Republic, each one of the 14 States (Provinces) in which the country is divided has its own autonomous sanitary authority and organization, so that—owing to the comparative scarcity of financial resources—they can boast of little

more than a mere outline of such an organization, and are compelled to depend on the National Government for their chief elements of health and welfare.

Furthermore, the cities of a certain degree of importance have also municipal services of health and welfare, and these are of particular importance in the Federal Capital (Buenos Aires), a city of more than 1,800,000 inhabitants, which alone has a Budget of nearly 20,000,000 pesos (a little over 7,000,000 American dollars) for its Public Welfare and Health Administration, besides which the "Benevolent Society" of the Capital receives from the government of the Nation 4,000,000 pesos for the support of various hospitals and asylums (especially for women and children) and that more than double this sum is distributed among the Commission of Asylums and Hospitals (colonies for the insane and for backward children; reformatory asylum for children; dispensaries and sanatorium for tuberculosis patients; regional hospitals in different parts of the country) and in subsidies to private welfare institutions, or such as have been established by the local authorities throughout the Republic.

The National Department of Hygiene, however, is directly in charge of all matters relating to Maritime and Fluvial Health, the defense against the introduction of transmissible diseases and the control of endemics and epidemics throughout the country, and particularly of malaria, which has been the object of a special law passed in the year 1907, and accepted by all the provinces affected by this endemic. It is also in charge of the control of the medical professions and of medicines and pharmacies, as well as of Public Health and Welfare in the Federal territories which have not yet attained the status of self-governing provinces (Chaco, Misiones, Formosa, La Pampa, Río Negro, Neuquen, Santa Cruz, Tierra del Fuego, Los Andes).

It is readily seen that in spite of the action of the federal states and municipalities and of the other institutions just mentioned, the present budget, of a little over 5,000,000 pesos a year for the Department of Hygiene, is very meager, for which reason its governing board has been compelled to request for next year an increase of more than 2,000,000 pesos, which it is hoped will be supplied by the National Congress.

It is to be observed, however, that whatever increases are secured in available resources, we cannot conceal the fact that the drawbacks resulting from the federal form of government and the consequent autonomy of the Provinces, which we have just mentioned, constitute a serious handicap to centralization in the hands of an au-

tonomous and competent national board so necessary in sanitary matters.

We must add, however, that fortunately a better understanding is growing up from day to day between the sanitary authorities and the federal government, and that in most cases the local authorities accept the suggestions of the National Department of Hygiene, and welcome its direct intervention whenever centers of epidemic disease appear.

It is to be hoped that a proper understanding of the general welfare will impress these facts more and more on the public mind and render the guiding action of the national health authorities more and more efficient.<sup>1</sup>

## II

Having outlined this general sketch of our sanitary organization, we shall now proceed to indicate the most important reforms and innovations effected in recent times and the principal data regarding the sanitary condition of the country.

*Selection and Improvement of the Technical Personnel.* The governing board of the Department of Hygiene, being convinced of the need of a health personnel particularly well equipped to efficiently carry out its functions of protecting the public health, has obtained of the government a decree providing that all technical positions are to be filled through competitive examinations of a theoretical and practical nature, except for certain executive posts, which are to be reached through promotion, based on demonstrated ability, or on the choice of personalities of outstanding merit.

The Department also proposes to establish, in cooperation with the University, a practical school of Hygiene, and improvement courses for the personnel of the service. For this work the Department counts on its large and well equipped Bacteriological and Chemical Institutes which enjoy the services of some of the principal professors of Hygiene and Sanitation.

A special course on Malaria was established in the beginning of the year for medical students who afterwards rendered service in the summer campaign. At a later period, a commission of eight physicians and bacteriologists and two engineers was sent to Italy, in order to take a course in malariology, under one of the most eminent professors of that country, which course has now been completed.

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<sup>1</sup> A National Sanitary Conference was held with this object in Buenos Aires, in October, 1923, and another will take place shortly, probably next year, with a view to the improvement of the results obtained in the former Conferences.

In addition to the above, it has been possible to secure a visit to this country by Professor Peter Mühlens, of the Tropical Institute of Hamburg, who during several months has sojourned in the malarial region, studying the disease, and has given theoretical and practical courses to the personnel of the anti-malarial campaign.

*Child-Protection and Welfare.* To diminish infant morbidity and mortality as far as possible, to promote the birth and growth of healthy and vigorous children, free from hereditary and acquired defects, is one of the principal preoccupations, at present, of the Department of Hygiene and of the Government.

In a considerable part of the country, and particularly in the principal cities, such as Buenos Aires, La Plata and Rosario, much has been done in this sense, both by the local authorities and by philanthropical institutions, so that infant mortality has fallen in those cities to 80, and even less, per thousand births.

But in other parts of the country, and particularly in the rural districts and remote provinces, the conditions are much worse, and a great deal remains to be done in the matter of eugenics, and in the protection of mothers and children. The mortality is above 100, and reaches even to 150 and 200 per thousand births in some provinces; the average throughout the Republic was 109 during the last year.

Consequently, a new section has been established in the Department of Hygiene for child protection and welfare, besides the one already existing, of school and child hygiene, and a campaign has been undertaken in some of the provinces and territories, in the expectation of the greater resources which we hope will be voted with the new budget. We also look forward to stimulating the action of the local and municipal governments.

An advisory council has been established in this section, with the primary object of bringing together the directors of the principal official and private institutions looking after children and mothers, and of harmonizing, coordinating and guiding their action and directing the education of the public as is done in the United States by the Children's Bureau and the Child Health Association.

Laws have been enforced during many years for the regulation of the labor of women and children, and several bills are now awaiting consideration in Congress concerning official protection for mothers and children, it being hoped that these bills will be discussed very shortly.

*The Control of Syphilis and Venereal Diseases.* This is another one of the questions which have been approached with determination during the last year. Up to the present only small and fragmentary ef-

forts have been made (a few dispensaries in the city of Buenos Aires, and in one or two of the provinces; popular education through a league of social prophylaxis).

In the National Department of Hygiene a new section of prophylaxis of leprosy, syphilis and venereal diseases has been established. Dispensaries, attended by specialist physicians, have been established in the ports of Buenos Aires (2), Bahía Blanca, Rosario, Santa Fé, and in the cities of Tucumán, Salta, Santiago del Estero, Jujuy, La Rioja, Corrientes, and San Luis. With the new budget, these services should be extended to other provinces and to the national territories.

In addition to the above, pamphlets, posters, moving picture films, etc., are prepared for the work of propaganda and popular education, and specialist physicians deliver frequent lectures on these subjects.

*Control of Tuberculosis.* A new section has also been established in the National Department of Hygiene, devoted to the control of tuberculosis, the aim being to establish a central board charged with guiding, or at least coordinating the various activities now dispersed among official establishments and private institutions.

While the Argentine Republic does not reach figures as high as those attained by the greater part of the European nations, and by some American nations, it has, nevertheless, a considerably high mortality from tuberculosis, particularly in its great cities. The disease tends to spread to the provinces, where it was formerly quite rare, in consequence of the increase in population, of the rising cost of living, and of an increased contact with sufferers coming from the great centers without the employment of any efficacious means of prophylaxis.

With a few corrections of the tables of vital statistics (owing to the omission of diagnoses or to concealed diagnoses), I estimate at about 15,000 the number of deaths from tuberculosis throughout the country in the last few years, which, with an approximate population of 9,000,000, gives a ratio of 166 per 100,000 inhabitants. In the city of Buenos Aires, the average population of which, during the last years, has been 1,800,000 inhabitants, about 5,000 die of tuberculosis, that is, 277 per 100,000 inhabitants, a rate which is rather high, although it is no doubt exaggerated by a considerable number of sufferers from tuberculosis who come to die in the capital.

Up to the present, very little really efficacious work has been done against this scourge. The *Liga Argentina contra la tuberculosis*, a philanthropical institution which receives subsidies from the national government and from the municipality of Buenos Aires, founded the

first dispensaries in this city and in Rosario, and more recently a small sanitarium in the latter city and a children's preventorium in Banfield, at half an hour's ride from Buenos Aires, the capacity of which is now being raised to about 100 children.

The National Government established a large altitude sanitarium in the Province of Córdoba (Santa María, at a height of about 800 meters), which has about 600 patients, and also several dispensaries in the capital and in the cities of Catamarca, Santa Fé, and Corrientes (under the Commission of Asylums and Hospitals).

The Benevolent Society, with funds from the National Government, has also erected a beautiful sanitarium-hospital for women and children at an hour's ride from Buenos Aires (Hospital Vicente López y Planes, at General Rodríguez), with an approximate capacity of 350 patients.

The municipality of Buenos Aires has its suburban sanitarium-hospital (Tornu, about 350 beds), several wards in the Muñiz Hospital (about 300 beds) and several dispensaries. A large children's preventorium is in contemplation.

At Córdoba there are two dispensaries and two small hospitals belonging to philanthropic institutions. In La Plata, the *Liga Popular contra la tuberculosis* maintains another dispensary and is carrying on an active educational campaign.

The municipalities and boards of education, and a philanthropical society (*Escuelas y Patronatos*) maintain vacation camps, school camps, and open air schools.

During these last few years, much has been done to improve the housing and living conditions of the working classes (National Commission of Cheap Houses, etc.), and to promote mutual anti-tuberculosis societies (see the communication of Delegate Llambías), several organizations having been established, namely, the mutual sanitarium of the postal and telegraphic services, the mutual teachers' institute and the mutual institute of the employees of the Departments of Public Instruction and of the Navy.

As can be seen, all this is very little in comparison with the needs of so large a country, in which, in view of the rate of ten patients to each death, which is the figure now generally accepted, especially after the famous experiment of Frammingham, in the United States, there are probably about 150,000 persons suffering from tuberculosis.

For this reason the National Department of Hygiene is endeavoring, in pursuance of the efforts put forth by its present President for many years, to have the National Sanitary authority centralized in one board charged with the work of unifying, or at least co-

ordinating the action of all institutions and establishments devoted to the prophylaxis and care of tuberculosis, and establishing, on an orderly and methodical plan, whatever agencies are still lacking.

This need will be supplied by the creation of a special section in the National Department of Hygiene which will direct, besides the work of coordination just mentioned, the campaign of propaganda and popular education, and prepare a complete plan of action which will be put in practice as soon as the funds authorized by a special law awaiting the approval of Congress are available, which it is estimated should yield from four to five million pesos per annum.

Furthermore, the new section of the Department will attend directly to the care of government employees suffering from tuberculosis, and to the prophylaxis of their families, having already established a number of dispensaries in the provinces, and having under contemplation several preventoriums at high altitudes and on the seashore. We hope that the action of this section will be greatly intensified after the approval of the new national budget.

It is gratifying to add, even though what we have in hand is no more than a project, that owing to the initiative of one of us (Aráoz Alfaro), the University of Buenos Aires has resolved to create an institute for the study and treatment of tuberculosis, which will be at the same time a hospital, an institute of investigation with all the necessary laboratories, a school for nurses and a social service center.

*Leprosy.* It is impossible to know, even with a certain degree of approximation, the number of lepers in the country. Probably there are no more than a few hundred in the Provinces of Entre-Rios, Corrientes, and Santa Fé; in the other states the number will hardly exceed a few dozen, outside of the federal capital, to which, as a matter of course, sick people come from all parts of the country, as is generally the case with all great centers.

A census is now being taken of lepers throughout the country, and we shall soon know the results, and be enabled thereby to prepare an adequate plan of treatment and prophylaxis.

There are now pending in the National Congress a number of bills authorizing isolation and other prophylactic measures recommended by science.

*Cutaneous Leishmaniosis* occurs only in the almost tropical region of the North (Chaco, Misiones, Jujuy, Salta) and in a very limited number of cases. Efforts are being made to discover the greatest number possible in order to subject them to treatment by emetic injections, which as a rule have given very good results.

*Kala-azar* has never been found in natives of the country.

*Smallpox and Vaccination.* After an intensive campaign of many years, the careful practice of obligatory vaccination in the first year of life, and revaccination ten years later, it may be stated that smallpox has become exceedingly rare in the country, at least in its important centers. But the territory is so extensive that it is not possible for vaccination to reach every home, and consequently a few foci make their appearance once in a while, particularly in small groups of Indians still existing in a savage state and in the remote regions of territories and provinces bordering on nations in which vaccination is not only not compulsory, but not practiced with regularity.

The National Government, the Provinces, and the Municipalities constantly maintain the necessary number of vaccinators to carry on this campaign, which fortunately meets with no resistance on the part of the people. The National Department of Hygiene maintains a large institute of Jennerian vaccine which supplies the whole country, while the Province of Buenos Aires maintains another institute of its own.

*Plague.* Since bubonic plague was introduced into the country a little over twenty years ago, it has not been possible to exterminate the disease completely, owing to the fact that from the beginning it has been transported by rail from the ports to many localities in the interior. During the last two years there have been only a few small epidemic foci, usually of the ganglionic type, but sometimes of pneumonic form, which have been immediately suppressed, the greater part being in the interior, there having been only a case here and there in the port of Rosario. But in the port of Buenos Aires, in which gangs of workmen are constantly occupied in the destruction of rats, it still happens that once in a while some of these animals are found suffering with plague, for which reason it cannot be said that we are yet entirely free of it.

In the interior, the territory is so vast and the trade in grain so considerable that, even with resources far superior to those which we now have, it would not be possible to effect the destruction of all the rats, and we must be content to proceed with their gradual extinction during a considerable length of time in those places in which cases have occurred, in the neighborhood of such places, and along the railways leading to them.

This campaign, as well as the dissemination of information regarding prophylaxis, is being carried on intensively, but it must be acknowledged that more often than not a focus is discovered where least expected, and under conditions which make it impossible to discover



its origin. We shall not attempt to deny that in our country a complete study of the question has not been made (particularly as regards the different rodents, a study which the Department of Hygiene intends to continue). It seems evident from the recent discussions of the Council of International Hygiene that there is still much to be investigated in regard to plague, as has been said by the Portuguese professor, Dr. Jorge.

In the principal ports, the campaign against rats has been carried on intensively, with redoubled efforts calculated to render all ships, warehouses and places ratproof.

*Typhoid Fever—Typhus.* Typhoid fever, which has been practically exterminated from all cities provided with an excellent supply of drinking water, is unfortunately still found in a considerable part of the country, in the rural districts, and in scattered small communities which derive their water from surface wells, which are frequently infected. This continues to be one of the diseases which take the heaviest toll in the richest region of the coast, and from the rural districts it is sometimes brought in vegetables and milk into the cities, where it causes a limited, and yet appreciable, number of cases.

The governments of the nation and of the provinces are endeavoring to extend the benefits of sewage systems and drinking water to as many communities as possible, but these are so very numerous throughout the rapidly and constantly developing country that it is not possible to effect all that is to be desired in this sense.

A great deal of effort is also being made to educate the people in the matter of prophylaxis, and to disseminate anti-typhoid vaccination, the good results of which are seen from year to year.

In our country there is no typhus. A few years ago a small epidemic occurred in the North, having been introduced from Bolivia. This was exterminated after a vigorous campaign in the mountainous region of that section. This year a case of unknown origin occurred in Jujuy; adequate prophylactic measures were taken, and the disease did not spread. We are always exposed to the danger of the introduction of the disease over the Andes, for which reason observation posts are constantly maintained in that region.

*Malaria.* This is the most serious endemic occurring in the country, and the principal preoccupation of the government and of the Department of Hygiene.

Malaria exists endemically in the Northern section, particularly in the Provinces of Tucumán, Catamarca, Salta and Jujuy. It is also found on a much smaller scale in the Provinces of Santiago del Estero, La Rioja, and Corrientes, and the territories of Chaco and Misiones.

The malarial section occupies a little more than one-tenth of the total extent of the country, that is, about three hundred thousand square kilometers, but only about half of that section can be considered seriously affected. The population of the region numbers about half a million inhabitants, or approximately one-twentieth of the population of the Republic.

Mild tertian forms are of most common occurrence, but in certain places there is a considerable proportion of tropical and pernicious forms. The most common transmitting mosquitoes are the *Anopheles pseudopunctipennis* and *A. argyrotarsus*.

Since the year 1907 we have had a special law, called the "Law of Anti-Malarial Defense", which places the direction of the campaign in the hands of the national Department of Hygiene and establishes the obligations of the local governments, railways and land-owners with regard to this endemic. This campaign is carried on in all the recommended forms; soil sanitation, human improvement or treatment of the patients, and preventive quinization (free quinine is provided by the State), but owing to the comparative scarcity of the population, the first method of control proves very expensive, and is only employed in the more populous centers.

During the last year, the work of sanitation in Farnallá (Tucumán) was brought to a finish, and similar work is now in progress in other parts of the same province, in Salta and Jujuy. In the budget bill for next year, an increase of 1,000,000 pesos is requested for the work of sanifying the soil, besides the sum of about half a million which is to be spent on quinization, and on the staff of physicians, helpers and so forth, for the sectional dispensaries and laboratories.

We have already said that investigating committees have been sent to Italy, and that constant efforts have been made to train the specialist staff, and to disseminate hygienic education among the people, and especially in schools.

*Hookworm.* This disease is largely disseminated in the Province of Corrientes, to the extent that in some places it has been found in as many as 80 per cent of the inhabitants, and in an average of about 60 per cent. It occurs also on a much smaller scale in Northern Santa Fé, in the territories of Chaco and Misiones, and perhaps at other points, as the geographic study of the disease has not yet been concluded.

Since a little over two years ago a vigorous campaign has been carried on by the National Department of Hygiene, the work having been begun by Dr. Bachmann, at that time director of the Bacteriological Institute and member of the Board of Hygiene. This

campaign is now actively progressing, and will be extended to the other territories mentioned. The parasite found is nearly always the *Necator americanus*, and the treatment employed first was oil of chenopodium and later carbon tetrachloride, which is preferred at the present time.

The government of the Province of Corrientes, in accord with the Department of Hygiene, has passed a special law prescribing the known prophylactic measures, and cooperates intensively in the work of treatment and popular education which is carried on.

*Trachoma and Infectious Conjunctivitis.* Owing to the lack of proper vigilance in regard to immigration, a number of Syrians, Spaniards, and Southern Italians suffering from trachoma were allowed to enter the country a few years ago, and the disease has spread in several provinces, constituting foci of some importance.

Of course, every possible effort is now being made to prevent the entry to the country of persons affected with trachoma. Besides this, a new section has recently been created in the National Department of Hygiene, entitled "Section of Prophylaxis of Trachoma and Infectious Ophthalmias", and the experts of this section, besides preparing lectures, posters, and pamphlets, perform periodical journeys throughout the infected regions where there are few oculists, diagnose and treat affected persons, and establish dispensaries with competent nurses to carry on the treatment.

In addition, they deliver lectures, visit schools, determine the indexes of morbidity and indicate prophylactic measures.

In Tucumán there is a provincial school for children affected with trachoma, and it will be necessary to establish others.

These journeys are also utilized to carry on the work of popular education regarding ophthalmia neonatorum, spring conjunctivitis and other epidemics which are found with frequency in some of the communities in the interior, and to teach the treatment of these diseases.

*Goiter and Endemic Cretinism.* In some parts of the country, particularly in certain Andean Provinces (Salta, Jujuy, Catamarca, etc.), endemic goiter prevails to a considerable extent, and is often accompanied by pronounced mental deficiency, which in many cases is to be classed as cretinism.

A census is also being taken of this class of sufferers, the work having been begun among the school children and continued with the rest of the population. But at the same time, in some of the most heavily affected localities the treatment with iodine in very small doses has

been undertaken in schools, in imitation of what has been done in Switzerland, the Tyrol, and the United States.

The investigations of Lozano, Kraus, Houssay and Lewis would seem to demonstrate the hydric origin of the disease, and up to the present, no cases of goiter have been found which appeared to depend on the trypanosomiasis which has been studied in Brazil by our distinguished friend Chagas.

*Alcoholism and Drug Addiction—Mental Hygiene.* While our country is not one of those suffering most from alcoholism, this evil exists quite extensively in some provinces and territories, particularly in those with a predominant population of Indian origin, as these people are given to the habit of drinking excessive quantities of sugarcane rum and grape brandy, besides other strong fermented drinks.

The problem has appeared to the President of the Department of Hygiene as one of sufficient gravity to warrant the creation of a section of prophylaxis of alcoholism and drug addition, since in several of the principal cities the use of stupefacients and narcotics (cocaine, opium, morphine, heroine, etc.,) has begun to spread.

This section has been established and made to include all matters connected with mental hygiene, prophylaxis of mental diseases, and legislation for the insane.

The section is now preparing the statistical data and other necessary studies for the drafting of laws and decrees against alcoholism and drug addiction. A number of bills are pending in the National Congress, one of which has been carried in the first reading, establishing grave penalties for persons effecting the clandestine introduction of cocaine and stupefying drugs, or trading in the same without a medical prescription.

The National Executive, in accord with the Department, has also planned an official monopoly of these substances.

*Hygienic Propaganda and Popular Education.* The Department of Hygiene, being convinced of the great importance of popular education regarding matters of hygiene and the chief perils threatening the community, with a view to form a popular conscience without which laws and regulations are always likely to prove inefficacious, has established a special section charged with this popular propaganda and the preparation of all the necessary elements to carry on throughout the country the objective teaching of hygiene in schools, in industrial centers and to the public in general.

Pamphlets, books, posters, slides, moving-picture films, etc., will be prepared and distributed throughout the country as elements to be used in the campaign against malaria, hookworm, trachoma, tuber-

culosis, syphilis and venereal diseases, alcoholism, children's diseases, etc. (Some of these posters are exhibited in one of the assembly rooms of this Conference).

We have also begun to prepare "Sanitary Cars", on all the railway lines, a sort of "Moving Sanitary Posts", equipped with a small laboratory, apparatus for disinfection and extermination of rats, sera and vaccines, a moving picture camera and a radio apparatus. These are intended to be carried along the railway lines, to be used in giving public demonstrations. The public will be attracted by the moving-pictures and the radio program, and these will alternate with the teaching of the elements of hygiene, and the performance of vaccination, disinfection, and rat extermination at the railway stations and small neighboring communities.

The trial which has been conducted up to the present with one of these sanitary cars warrants the hope that they will prove an appreciable element of cooperation in the educational campaign, besides their utility as a small unit of disinfection and insect elimination, being able to move up and down the lines and come to the rescue without loss of time in cases of plague or other transmissible diseases, in the interior of the country.

It is our hope that we have given in these pages a condensed summary, and yet a sufficiently precise one, of the sanitary conditions of our country, and of the principal changes effected since the former conferences.

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of Medicine of Buenos Aires.*

JOAQUÍN LLAMBÍAS,  
*Professor of Pathological Anatomy and  
Director of the Pathological Institute  
of the Faculty of Buenos Aires.*

#### THE PURIFICATION OF MANURE BY THE METHOD OF NATURAL ELIMINATION OF THE LARVAE

The experiments effected with Dr. Federico Susviela Guarch in Buenos Aires in 1918, both in the form which we might describe as "under glass," and in the forms which we afterwards developed on a larger scale, were preceded by the study of different questions, which we shall enumerate as follows:

First. Number of horses in the city.

Second. Quantity of manure produced by each animal according to its usual feed.

Third. Study of the ordinances issued regarding the collection of the manure and the tax on each animal.

Having effected all these investigations we were able to determine that the number of horses in the city reached the figure of 50,000 and that each animal produced an average yield of 11 kilos of fresh manure, whence we arrive at the conclusion that there is a daily production of 550 tons, which amounts in a month to the enormous amount of 16,500 tons.

The collection of the manure was effected without the least regard for the ordinances, and the same carts which conveyed vegetables from the neighboring farms carried back manure on their return journey. Although the ordinances imposed taxes on the owners of horses and stables the specified quotas remained unpaid.

The experiments performed were as follows:

The manure is placed in a layer of a metre or a metre and a half in thickness in a rectangular receptacle measuring about 10 metres by 6 metres, the bottom of which is pierced with a series of holes. This is put over a cement tank containing water. Over the receptacle is placed a covering of sack-cloth or burlap. The manure retains its liquid, but if it should become dry it is necessary to add water to help the fermentation.

Once the fermentation has begun, the larvae, fleeing from the light and the heat, reach the lower layers of the manure, pass through the holes, and fall in the water where they perish by the thousands.

When the fermentation is ended and the material is free of larvae it is passed through a press by which it is shaped into bricks, during which operation addition is made of a small quantity of earth or of a mucilaginous substance obtained from the maceration of the century plant (agave). The loaves or bricks can be preserved for any length of time. They are used either for manure or as fuel.

If we bear in mind that the domestic fly lays its eggs preferably in a dunghill, the heat and humidity of which favors the hatching of the eggs, we can easily understand how the method destroys the great source of production of the fly, without depriving the product of its utilizable value.

From investigations performed by us at the time, we conclude that while the procedure is calculated to promote the interests of public health, since the fly is a vector of diseases capable of playing an important rôle in children's complaints, it is worthy of being studied as a factor of resources to carry on the work itself.

We believe the procedure is applicable not only in cities, but also on farms, etc., the only difference being that in cities a larger number of receiving tanks will be required, while in the case of very large cities proper stations could be established at different points throughout the city limits.

DR. JOAQUÍN LLAMBÍAS.

## REPORT OF THE DELEGATION OF THE GOVERNMENT OF CHILE TO THE SEVENTH PAN AMERICAN SANITARY CONFERENCE

Messrs. Delegates: Continuing the established observances of and following the recommendations adopted in these Conferences, the Chilean Delegation presents herein a summary of the progress realized in matters of public hygiene since the last Conference which took place in Montevideo in 1920. Our delegate to said Conference, Doctor A. Atria, acquainted its members with the provisions of the Sanitary Code promulgated on the 22nd of May, 1918, as well as with all the regulations and by-laws issued for the purpose up to that date.

Subsequently, the study of our sanitary organization has been continued and the necessary rules for the practical application of the Code have been framed.

We give below a list of such regulations as are still in force:

I. Rules for the importation and sale of opium and its derivatives, and of coca and cocaine and their succedaneums, issued on the 14th of February, 1921.

II. Rules for the sale and distribution of the products of the Institute of Hygiene, issued on the 18th of February, 1921.

III. General regulations for the installation of house connections to the sewerage system, of the 16th of July, 1921.

IV. Regulations for the departments and employees of the smallpox vaccination service, July 30, 1922.

V. Regulations for the vaccination and re-vaccination in public schools against smallpox, Sept. 6, 1921.

VI. Supplement to the standing petitions, June 14, 1922.

VII. Amendments to the regulations for apothecaries' shops and drug stores, of the 19th of June, 1922.

VIII. Maritime and Frontier Sanitary Police Regulations, issued on the 10th of October, 1923.

IX. Regulations for the Institute of Hygiene, of the 3rd of July, 1924.

X. Inclusion of paratyphoid fever among the diseases subject to compulsory declaration, Art. 52 of the Code, of the 10th of October, 1923.

XI. Reformation of the Maritime and Frontier Sanitary Police Regulations, of the 23rd of February, 1924.

XII. Amendments to the Vaccination and Re-vaccination Regulations, of the 21st of February, 1924.

XIII. Amendments to the Regulations for the Vaccination and Re-



vaccination of Educational Establishments, of the 25th of January, 1924.

XIV. Interpretation of Art. 4 of Animal Sanitary Police Regulations, of the 16th of March, 1924.

XV. Reformation of the Regulations for Apothecaries' and Drug Shops, of the 9th of August, 1924.

XVI. Reformation of the Regulations for the Animal Sanitary Police, of the 9th of August, 1924.

XVII. Modifications of the list of charges in the Animal Sanitary Police Regulations, of the 19th of August, 1924.

We have the honor to place at the disposal of the Delegates, through the medium of the Secretary, the corresponding copies and pamphlets of the above. (Annex I.)

Among the body of regulations and measures enacted these last years in this country we have to note the organization given to the Chilean Red Cross, an institution which is so closely connected with the work of these Conferences.

Law No. 3924 of April 17, 1923, conferred upon the Red Cross legal personality, declaring it at the same time a National Institution, destined to serve as an auxiliary to the sanitary authorities, taking care in time of war of the wounded, sick and prisoners, and attending to the betterment of their conditions; while during peace concerning itself mainly with the hygienic education of the people, the relief of public calamities, and with sanitary work in general.

Subsequently, on the 26th of October, 1923, the General Regulations of the Chilean Red Cross were framed, and on the 7th of May, 1924, a decree was issued by the Ministry of Justice and Public Instruction creating the Juvenile Red Cross.

On the 14th of February, 1924, a decree was issued authorizing the central committee of the Red Cross to organize throughout the country the Public Health Week, encouraging the conscription or enrollment of new members, and to solicit donations (to be known as Public Health Oblations) in order to obtain the necessary funds for the carrying out of their duties.

At the present moment the work of the Red Cross is mainly concerned with the foundation of local organizations of the Public Assistance (which in other countries is known as First Aid Service), in those towns where they are not yet established.

Our Government, in accordance with various proposals presented in some of the former Sanitary Conferences, which took a definite shape in the Fifth International Pan American Conference held in Santi-

ago in the year 1923, has sent a message to Congress proposing to institute the profession of Hygienist Physicians.

The sanitation of towns and ports has been a constant endeavor of the Government. The corresponding works are carried out by the Board of Public Works, and on their completion their exploitation and maintenance is undertaken by the Inspectorate of Water Supply and Drainage.

SANITARY AND DRINKING WATER SUPPLY WORKS COMPLETED DURING  
THE YEARS 1921, 1922 AND 1923

*Province of Tacna*

Sewerage of Arica.—On contract. Year 1923. Amount spent, currency, \$688,428.60.

Sewerage of Arica.—On contract. Year 1923. Amount spent (gold), \$156,478.46.

Sewerage of Arica.—Technical supervision. Year 1923. Amount spent, currency, \$43,823.40.

*Province of Antofagasta*

Sewerage of Tocopilla.—On contract. Year 1923. Amount spent, currency, \$616,293.13.

Sewerage of Tocopilla.—On contract. Year 1923. Amount spent (gold), \$42,888.44.

Sewerage of Tocopilla.—Technical supervision. Year 1923. Amount spent, currency, \$100,810.50.

*Province of Santiago*

Sewerage of Presidential Residence, Munition Factory and Public Shelter of the Quinta Normal.—By administration. Year 1921. Amount spent, currency, \$7,957.

Sewerage of Presidential Residence and Girls' Lyceum No. 3.—On contract. Year 1921.

*Province of Aconcagua*

Sewerage of the Lyceum of San Felipe.—On contract. Year 1921.

*Province of Ñuble*

Sewerage of Lyceum No. 3 of Chillán.—On contract. Year 1921. Total amount spent for the three last works, currency, \$60,687.

*Province of Talca*

Sewerage of the Agricultural School.—On contract. Year 1922. Amount spent, currency, \$33,869.

*Province of Concepción*

Sewerage of the Agricultural School.—On contract. Year 1922. Amount spent, currency, \$176,330.

*Province of Cautín*

Sewerage of the barracks of Tucapel regiment in Temuco.—On contract. Year 1922. Amount spent, currency, \$30,326.

*Province of Tarapaca*

Iquique Water Supply.—On contract. Year 1923. Amount spent, (gold) \$1,986,320.97.

Iquique Water Supply.—On contract. Year 1923. Amount spent, currency, \$798,315.99.

Iquique Water Supply.—Technical supervision. Year 1923. Amount spent, currency, \$208,087.87.

*Province of Aconcagua*

San Felipe and Los Andes Water Supply.—On contract. Year 1923. Amount spent, currency, \$1,840,710.62; gold, \$425,411.79, and £1,690-18-8.

## SANITARY AND DRINKING WATER SUPPLY WORKS UNDER CONSTRUCTION

*Province of Atacama*

Sewerage of Copiapó.—On contract. Amount spent, currency, \$379,900.

*Province of Concepción*

Enlargement of the sewerage of Concepción.—On contract. Amount spent, currency, \$235,928.80.

Enlargement of the sewerage of Concepción.—On contract. Amount spent (gold), \$9,581.

*Province of Valdivia*

Sewerage of the barracks of the Caupolicán Regiment.—On contract (estimate), currency, \$84,000.

*Province of Coquimbo*

Sewerage of Coquimbo.—On contract (estimate), currency, \$1,313,882.

*Province of Concepción*

Sewerage and Water Supply for Talcahuano.—On contract (estimate), \$1,891,896. Amount spent, currency, \$1,521,871.

*Province of Coquimbo*

Serena Water Supply.—On contract (amount spent already), \$538,865.85, currency.

Serena Water Supply.—On contract. Technical supervision, \$34,067.65, currency.

Coquimbo Water Supply.—On contract (amount already spent), \$164,258.56, currency.

Coquimbo Water Supply.—On contract. Technical supervision, \$53,342.15, currency.

*Province of O'Higgins*

Rancagua Water Supply.—On contract (amount already spent), \$179,618.27, currency.

Rancagua Water Supply.—On contract (amount already spent) (gold), \$6,862.68.

Rancagua Water Supply.—On contract. Technical supervision, \$9,575, currency.

Peumo Water Supply.—On contract (amount already spent), \$92,750, currency.

Peumo Water Supply.—On contract (amount already spent) (gold), \$115,150.

Peumo Water Supply.—Technical supervision, \$16,800, currency.

*Province of Concepción*

Talcahuano Water Supply.—On contract (amount already spent), \$246,093.33, currency.

Talcahuano Water Supply.—On contract. Technical supervision, \$95,820, currency.

Lautaro Water Supply.—On contract (amount already spent), \$170,071.12, currency.

Lautaro Water Supply.—Technical supervision, \$12,706.66, currency.

The details of all these works will be found under Annex No. 2: Report of the Board of Public Works of the year 1923 and Statistical Annual of the Republic of Chile, Vol. III Politics and Administration, years 1921 and 1922, pages 87 of both works.

The board of Water Supply and Sewerage has invested during the years 1921, 1922 and 1923 the sum of \$1,048,720.96, paper currency, in the improvement and enlargement of the services under its charge; this sum has been distributed among 14 different systems, as shown in detail in Annex No. 3, which at the same time comprises a list of

those towns which have drinking and sea water supply and sewerage systems in operation. Of these towns, 66 have a population of under 10,000 inhabitants, 8 have between 20,000 and 50,000 inhabitants, and 4 are cities counting with more than 50,000 inhabitants.

All the works mentioned above have been undertaken and are at present operated by the Government. The systems belonging to municipalities or to private parties are twelve in number (See Annex No. 3).

Projects for the following works are being studied and prepared: Sewerages for the cities of Vallenar and La Unión, a pumping station, a distilling plant, and a system of sea water service for the port of Tocopilla; sewerages for the port of Iquique and for the cities of Linares and Temuco; enlargement of the sewerage systems in Talca and Curicó; drainage works and leakage prevention in the sewerage of the port of Arica.

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Prophylactic measures against the spread of infectious diseases are today taken in accordance with the provisions of the Sanitary Code.

*Smallpox*.—During the years 1921, 1922 and 1923 and the first six months of 1924 there have appeared in this country the following cases:

Year 1921.—11,701 cases with 5,131 deaths.

Year 1922.—7,263 cases with 3,252 deaths.

Year 1923.—3,502 cases with 1,551 deaths.

Year 1924 (first semester).—260 cases with 102 deaths.

Since the year 1921 the number of vaccinations has been intensified, as shown by the following figures:

Year 1921.—318,067 first vaccinations and 1,332,069 re-vaccinations.

Year 1922.—207,383 first vaccinations and 898,106 re-vaccinations.

Year 1923.—136,540 first vaccinations and 759,126 re-vaccinations.

Year 1924 (first semester).—38,898 first vaccinations and 349,396 re-vaccinations.

We believe that by complying with all the provisions of the Sanitary Code and of the regulations recently issued this epidemic will finally disappear from our disease and mortality tables.

*Typhus*.—This epidemic has been a constant source of preoccupation for this country during the past years, and notwithstanding the fact that the percentage has been declining, we still have to show figures that oblige us to intensify the application of prophylactic measures against its spread.

Year 1920.—7,138 cases in the whole country, with 1,182 deaths.

Year 1921.—4,503 cases in the whole country, with 569 deaths.

Year 1922.—4,469 cases in the whole country, with 903 deaths.

Year 1923.—3,294 cases in the whole country with 642 deaths.

Year 1924 (first semester).—1,340 cases in the whole country, with 186 deaths.

For the special prophylaxis of typhus there have been built in Santiago two bathing establishments, with everything complete, including two cleansing houses and apparatus for the disinfection of clothes, etc. The provincial towns have also been provided with similar installations, using for that purpose the equipment of the disinfecting stations.

*Plague*.—Up to this time we have not undertaken in a systematic way the examination of rats, because only a few cases of plague have appeared in the country. As the index showing the degree of infection of a port or city is given by the extent of the infection and mortality of these rodents, we may state that in those ports where some cases made their appearance nothing has shown that the mortality of rats has been in any way extraordinary.

The cases that occurred during these last years are the following:

Year 1920:

In Iquique.—7 cases, of which 1 was fatal.

In Antofagasta.—23 cases, of which 9 were fatal.

Year 1921:

In Iquique.—16 cases, of which 7 were fatal.

In Antofagasta.—2 cases, of which none proved fatal.

Year 1922:

In Iquique.—5 cases, of which 1 was fatal.

In Antofagasta.—2 cases, of which none proved fatal.

Year 1923:

In Iquique.—0 cases.

In Antofagasta.—2 cases, of which none proved fatal.

Year 1924 (first semester):

In Iquique.—0 cases.

In Antofagasta.—32 cases, of which 5 were fatal.

*Malaria*.—It exists in a very limited degree and only in a small area of the extreme North of the country, and its influence on our demography is of no importance.

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Messrs. Delegates: Having tried to achieve in the most exact manner possible our purpose of acquainting the Conference with the sani-

tary conditions obtaining at present in our country and with the measures of public hygiene that have been enacted in order to improve said conditions, and having besides enumerated the principal sanitary works of our cities and towns, we proceed to analyze all those points on which we have to report, as they will be the subject matter of this assembly.

Number 1.—In Chile there are no cooperative societies for fighting tuberculosis, but there is active in Santiago a League against Tuberculosis, which is a private association and maintains a preventorium for children in the port of Cartagena, sending them there to reside for a month. During the past year 311 children have been sent to that place during the months of December to April.

There is also in Santiago a Ladies' League against Tuberculosis which maintains several dispensaries for the treatment and prevention of this disease.

In Valparaíso there is a similar institution working independently of those of the capital. It also maintains dispensaries for the prevention and treatment of the disease, besides a sanatorium for adults in Peña Blanca with a capacity for attending 100 indigent and 30 paying patients. In Los Andes there exists the Edwards Sanatorium due to the munificence of Señora Juana Ross de Edwards.

The Board of Welfare of Santiago has kept going for some time a sanatorium in San José de Maipo, a high mountain spot, very well adapted to the purpose, which although temporarily closed, will be reopened very soon.

Many of the provincial dispensaries give a preferential attention to tuberculous patients, but such enterprising movements have not yet been put under a single control, as would be desirable.

Number 3.—There exists in this country, legally established, with recognized legal status, and with all the formalities required by law, an institution called the "Chilean League of Social Hygiene," which by an express resolution of the Government has under its charge the importation and sale of medical preparations destined to fight the spread of syphilis and to provide the public with such preparations.

This institution, which is controlled by physicians and apothecaries, does not pay a single tax or impost for the trade it does, besides having authorization from the Government for importing free of duty the foreign preparations it brings into the country. The league has entered into an agreement with the German chemical works of Meister, Lucius & Co., who are the manufacturers of Neosalvarsan, it being established in said agreement that the League is the exclusive

depository and representative in Chile of the mentioned product. It also imports the "Prophylactic Ointment" containing calomel.

Number 7.—The Sanitary Code of the Republic provides in Art. 52 that "All medical practitioners attending persons afflicted with smallpox, scarlet fever, dyphtheria, typhoid fever, typhus, yellow fever, plague, cholera morbus, leprosy or trachoma, shall give notice thereof to the Chief of the Disinfecting Station, or if there be no such official, to the governor of the department, within 24 hours after the diagnosis, positive or probable, has been made."

"If when there is an epidemic officially declared, there happen to be a sick person having no medical assistance, the above obligation falls on the owner or tenant of the house, or on the landlord of the public or private establishment where such person might happen to be at the time. All infringements of the above rules are punishable with a fine ranging between 50 and 200 pesos, and any reincidence with double the corresponding fine."

By decree of the 13th of October, 1923, paratyphoid fevers are added to the list of diseases subject to compulsory declaration.

Number 8.—In Chile the Statistical Annual of the Republic is published every year with great regularity, and it consists of the following volumes:

- I. Demography,
- II. Welfare, Medical Service and Hygiene,
- III. Politics and Administration,
- IV. Justice, Police and Crime.
- V. Education,
- VI. Finance,
- VII. Agriculture,
- VIII. Mining,
- IX. Industry,
- X. Domestic Trade,
- XI. Foreign Trade,
- XII. Communications.

The Central Bureau of Statistics with its personnel is responsible for the collection throughout the whole country of the required data, and day by day this work is getting nearer to perfection. Volumes I, II and III containing statistical data which may be interesting to the Delegates, make up Annex No. 4 (Years 1922 and 1923).

In accordance with the provisions contained in Chapter X, Art. 124, of the Sanitary Code, "Medical Statistics," the management of the Institute of Hygiene of Santiago is in charge of the medical and



sanitary statistics of the whole country, and in virtue of this it continues to publish the Bulletin of Hygiene and Demography, which had begun to appear long before the above-mentioned code was enacted.

Number 9.—The fight against syphilis and venereal diseases in this country is in charge of the municipalities, but at the same time the Sanitary Service of the Army and some private institutions and societies have considered it necessary to cooperate in this task.

At present the municipality of Santiago is busy with the reorganization of the sanitary vigilance of prostitution and has modified its obsolete methods of regulating it, establishing at the same time the Prophylactic Institute, which comprises several dispensaries well provided with laboratories, where the work is carried out in the most up to date manner, and in hours well suited to the convenience of working men and their families, who can in that way be comfortably subjected to a sustained treatment.

The work carried out by this institute during the years 1922 and 1923 is as follows: 125,565 medical attentions, 61,389 mercurial injections, 6,054 injections of Neosalvarsan, 23,929 urological treatments, 1,826 Wassermann reactions, 1,187 ultra-microscopic examinations and 8,528 prescriptions. All this work has been done with an appropriation of \$106,600, paper currency.

About 20 per cent of the persons treated were between 15 and 20 years old, 60 per cent between 20 and 30, 18 per cent between 30 and 40, and 2 per cent over 40 years old. Of these persons, 2,804 had acquired the virus in public brothels, 1,865 from clandestine prostitutes, and 1,974 could not account for the source of infection.

The Institute, which is now five years in existence, has an interesting record of its work, which you may find in detail under Annex No. 5.

The municipality of Valparaíso has succeeded in obtaining an almost perfect organization in this matter. All prostitutes are examined in special departments situated in the midst of the infected quarters, and those found apt to spread contagion are interned in the special hospital kept by the Service, by virtue of law No. 3384, in force since the 22nd of May, 1918, which prescribes that any woman resisting this measure is liable to 60 days' imprisonment, without prejudice of being submitted beforehand to the required medical treatment. The prostitute leaves the hospital as soon as the danger of contagion is over, but she is obliged to continue her treatment in the polyclinics of the Service until complete cure is attained.

A laboratory attached to the polyclinics is in charge of the sero-

logical investigation of the prostitutes who are periodically examined. This laboratory serves the public in general, specially members of workmen's unions, employees with small means, etc., charging very moderate fees.

Due to the poor habits of hygiene of our lower classes and to their ignorance, it is necessary to adhere strictly to the regulations in force.

There are two services of prevention working every night in the quarters of the town mentioned above, from 10:30 p. m. to 4 a. m., with the object of providing the visitors to such places with means of prevention as well as of disinfection immediately after intercourse. Notices placed for the purpose in visible parts of the brothel-house advise these services and insist on their absolute necessity.

The municipality of Valparaíso also struggles against venereal diseases among men, maintaining for that purpose three dispensaries, similar to those of the Prophylactic Institute established by the municipality of Santiago, and which are provided with a modern laboratory, serving the public gratuitously every evening from 6 to 7. Particulars about this service and the corresponding statistical data are also found under Annex No. 5.

The Government of Chile has not yet started among the civil population an organized campaign against those diseases which are a menace to society, but it has done its duty in this respect towards the armed forces. A Service of Social Hygiene in the Army has been created, consisting of several divisionary sanitary groups, styled Experimental Sections of Military Hygiene. The respective organic decree, dated the 23rd of March, 1921, establishes an Experimental Section for each division of the army. Each of these services consists of four sub-sections: Bacteriology, Disinfection, Water Purification and Social Hygiene, and the first of these sections makes all the examinations that are required by the service, either while in garrison or in campaign; the second section does all the work of disinfection in both these circumstances; the third supplies the troops in campaign with sterilized water on every occasion when there is suspicion that the water is not fit for drinking; and finally, the fourth section acts against those communicable diseases which are specially harmful to the race; for this purpose it divides its work into two sections: one to take care of those individuals still sound, and the other, to look after those already afflicted with the disease.

The last mentioned sub-section consists of a propaganda department, a controlling and statistical department, of a clinical depart-

ment with radiological and electro-cardiographical branches; and of a laboratory department (serology, ultra-microscopy, bio-chemistry, urethral micro-biology and experimental investigation).

To sum up, the Experimental Section of Military Hygiene collects all the data concerning the venereal conditions of each division, observes and conducts the regular prophylaxis, controls and applies the proper treatment, directs the instruction on the preventive and curative prophylaxis; and its action extends even, though in a most discreet manner, to the privacy of the home, to avert any impending danger. All this work is undertaken in conformity with army regulations governing the control of those diseases which may have harmful consequences to the welfare of society.

On the 12th of February, 1923, the Government issued a decree appointing a commission of military surgeons to prepare a set of regulations for the control of the mentioned diseases and to study in the first place the demonstrative investigation of the venereal conditions of the fresh contingents joining the ranks, in order to obtain in that way a collective demographical knowledge which can serve as a basis for appreciating the efficiency of the organized service of control; to frame regulations governing the medical prophylaxis, the working of the prophylactic stations, the duties of the sanitary personnel in the management of the different departments, and the penalties to be applied in cases of neglect in the discharge of the high duties thus imposed for the preservation of health; to fix the order of the programs to be developed by the corps surgeons and to determine what contingents should be allotted to them by the Department of Propaganda of the Experimental Section of Hygiene; to frame rules for establishing the form of reports and certificates of cure to be issued to members of the Army before obtaining their marriage license, whether the respective individuals be sound or registered as venereal; to frame rules for reporting to the Department of Control every fresh case of venereal disease among the newly enlisted men or which may appear during service, in order to insure in that way uniformity in the practice of recording and controlling the treatment; to establish methods of investigation conducive to an early diagnosis of the disease; to obtain uniformity of treatment in the clinical service, or in the regimental personnel, when the former be not indispensable, or when the wide distribution of the troops preclude the former; to determine what sort of cases should be kept in isolation and what restrictions should be imposed on the granting of leaves of absence, and on what occasions all sexual intercourse should be prohibited; to

establish the form of schedule for the individual record of the treatment applied to cases openly infectious; to study the sanctions that should be applied and the fines to be imposed.

The body of regulations above enumerated was issued at the end of February, 1923, and complemented with the following bill sent to Congress by the Government: "Sole article. No individual who on the expiration of his term of service is in a state of venereal contagiousness shall be discharged until all danger to the community has disappeared, because the rights of the individual end where collective rights begin."

Everything pertaining to the organization of the services mentioned and the corresponding regulations will be found in the printed volume entitled "Pro Raza," attached to Annex No. 5.

The Public Beneficence of Santiago maintains a home for syphilitics, styled "Pabellón Díaz Muñoz," with the object of curing prostitutes who are in the period of contagion; it consists of a polyclinic provided with very up-to-date laboratories, which is also open to the public every morning; it has 70 beds distributed in large and small rooms, built only five years ago. The establishment is attached to the San Luis Hospital, an institution which is devoted to men and women afflicted with venereal and cutaneous diseases, and has in all 70 beds for both sexes. During the present year, 771 persons have received medical attention there, of which 279 were men and 492 women.

The Public Beneficence has also several other dispensaries for voluntary consultation and assistance, which are attached to the hospital services. Among them we may cite specially the one annexed to San Vicente Hospital depending directly from the Syphilography Clinic of the University.

Public action to check the spread of the disease is in the hands of such institutions as the Chilean League of Social Hygiene, founded in 1917, whose work up to the present has been merely of an educational nature, as may be seen by examining the collection of small pamphlets which make up Annex No. 6. This institution is at present trying to erect a model polyclinic, in which the main principles essential to an efficient campaign could be applied simultaneously; education, medical and moral prophylaxis and treatment.

Another institution, known under the name of The White Cross League, undertakes the rescue of girls gone astray, keeps for the purpose an excellent establishment in the outskirts of the capital and is under the direction of ladies of high social standing.

The "Patronato Nacional de la Infancia" (National Institution for the Protection of Children) also wages a very active war on those diseases which are of utmost consequence to the community. In its services, styled "La Gota de Leche" (The Drop of Milk) which are eleven in number and distributed all over the city, it has special departments for treating during pregnancy women who are syphilitic, and who on becoming mothers continue their treatment together with the newly-born child. Most of the "Gotas de Leche" (Milk Dispensaries) in the provinces carry on their work along similar lines.

Financial institutions, such as the "Caja de Crédito Hipotecario" (Bank of Hypothecary Credit), which dispose of great resources, have aided with generous hand the work of social improvement, adding in every case to each newly built quarter for working people corresponding accommodations for installing hospitals, milk dispensaries, infants' homes, etc., in which considerable sums of money have been spent.

From what we have said it may be seen that some noble work has been done, but we have to remark that there is not yet a thorough comprehension of the real importance of the problem, which calls for a coordinated action in studying and fighting such diseases as have a bearing on the future of the race. The whole of this work ought to be under the control of the State, which could in that way bring to bear its authority on the way of carrying it out.

The ample development that should be given to an adequate education on such matters as sex problems, tuberculosis and alcoholism, and which, beginning at the primary schools in the midst of the proletariat should terminate at the university and extend even to the leading classes of society, can in no way be given in an efficient manner by isolated institutions and corporations spread throughout the Republic. The firm control of prostitution and of its contagious foci should not be in the hands of municipalities; it ought to be an exclusive function of the State, because without a centralized and concerted action the intervening zones which lie between different territorial jurisdictions get out of reach of the local authorities. The White Crosses of the State, reformatories, as they are called in the United States of America, constitute in fact the only authority capable of confining the unsubmissive contagious offenders who persist in continuing their unhealthy trade.

Municipalities and private corporations can never unite their efforts in such a way as to produce harmonious results, because they can not be guided in their activities by a single accepted criterion; and be-

sides, they seldom have the necessary means to carry out their work in a satisfactory manner. Only the Government, being the one recognized authority, can command the means and mark out the course to be followed in establishing a system of physical and moral education capable of counterbalancing the attractions offered and the needs created by the brothel and the public house.

There are at present in Santiago, Valparaíso, Concepción and other cities sporting and athletic fields for recouping lost physical strength and special places and public squares where children play at their ease.

We should like to terminate our observations on the above points submitting to this great assembly the following resolution:

"The ample education (which should begin at the primary school), the firm control of every physical and moral infecting focus, the compulsory cure in clinics or sanatoriums (for syphilis, tuberculosis, alcoholism), means for the recouping of lost vigor (stadiums, school camps, sporting grounds); all these measures, which are so essential to the welfare of the race, constitute the fundamental task in the life of nations, a task which can not be controlled and disciplined but by the authority of the State, free from the influence of political and local interests; and furthermore, that all leagues, committees and beneficent societies are efficient collaborators."

Number 12. In our country the researches on ankylostomiasis were commenced as far back as 1920, in which year Walter Fernández, under the guidance of Dr. Juan Noé, professor of Medical Zoology and Human Histology, undertook the study of this subject, having been commissioned therefor by the Supreme Government. Though they could not take the necessary time nor avail themselves of all the requisite means for a complete investigation of the matter, yet Dr. Fernández was able to arrive at the following conclusions:

1st. Hookworm infection takes place either through the buccal cavity or through the skin. We consider the first of these channels as the natural migratory way of the parasite into its host, although from an epidemiological viewpoint the cutaneous path can account, under special circumstances (mines, coffee plantations, etc.), for many serious infectious conditions, more so when the parasite works with certain continuity.

2nd. The skin itself presents the greatest obstacle to infection through it, for many of the larvae which manage to go through cannot get beyond the barriers set up by the lymphatic vessels and ganglions.

These difficulties increase with the age of the host and can even become insurmountable.

3rd. The greater part of the *A. caninum* larvae get into the skin passing right through the epidermis, specially in young dogs; and those which get in by means of the hair find their way, either between the root of the hair and the epithelial sheath (Loos), destroying thereby its internal coating (Huxley and Henle), as we have had occasion to observe, or burrowing along the walls of the exterior epithelial sheath. In some special cases they can even utilize for their purpose the sudoriparous glands.

4th. The horny cover of the skin is sufficiently resistant, and all lesions necessarily take place in the Malpighian mucous stratum, which can thus be totally destroyed.

5th. The paths of the larvae are marked by an intense inflammatory reaction in all the infested organs (at least on those in which we could detect the parasites, such as the skin and ganglions); and the extent of the inflammatory process is not always in proportion to the parasitical infection, as it appears that the reaction can even surpass in great measure the corresponding stimulus.

6th. The duration of the parasitical development depends on the infecting medium used, and it is in precise accord with the class and age of the culture.

7th. The eosinophilia is represented by a curve which after attaining a maximum height, individually variable, drops gradually.

8th. There is still wanting an explanation of the behavior of the ankylostoma with respect to their migration via the skin, that is to say, of the wide diversity of the results obtained for corresponding cases in the different countries.

With respect to the epidemiology of this disease the investigation shows the following conclusions:

(a) Ankylostomiasis exists in the coal districts of the South, in the province of Concepción as well as in that of Arauco.

(b) In the northern section of the city of Concepción it presents all the characteristics of a serious epidemic, said section constituting at present the principal focus from which the disease is spread. In the southern section of the town it appears more mild, assuming rather the form of an endemic.

(c) No endemical foci have been discovered out in the open, and no cases of infection among the families of the miners have been reported.

(d) The species found is the *Ankylostoma duodenale* (*Dalizu*).

(e) Carriers of worms constitute the majority of those infested, as much as 80 per cent to 90 per cent of the total.

(f) The clinical forms are chronic and the most frequent are the chronic abdominal form and the cachectic form (Manouvriez).

(g) The infection takes place through the buccal cavity as well as through the skin, and it is considered that more epidemiological importance attaches to the first of these two modalities.

(h) The true boundary lines of the extent of the epidemic have still to be determined, carrying the research farther, so as to also include the mines of Lebú.

Only after an exhaustive study would it be possible to establish the basic regulations for the prophylaxis of the region, and to go into the prophylactic details peculiar to each mine in particular.

The foregoing are all the results that could be arrived at in the study of this subject, and they constitute, as far as we know, the only research undertaken in this country.

Number 14. The preparation and production of drugs (using this term in its generic sense), is amply developed in this country. There are five chemical establishments which manufacture pharmaceutical products of very high repute, besides eight of ten more which are of secondary importance. Some of the neighboring countries, Bolivia specially, consume a great amount of these preparations, which are highly esteemed there. At home, the products of the national laboratories have driven well nigh entirely out of the market most of the foreign officinal preparations, which only twenty years ago had an absolute command of the drug market.

There is also in operation, since a short time ago, a biological laboratory managed by a group of expert physicians and pharmacutists, all specialists in their line.

The formulary on which the elaboration of the pharmaceutical products is based is the National Pharmacopoeia, a code which with small variations follows the French Codex.

The control exercised by the Inspectorate of Apothecaries' Shops over the process of manufacture, and the qualities and characteristics of the drugs prepared, is based on the rules laid down for that purpose in the National Pharmacopoeia.

The number of different products prepared by the laboratories mentioned reaches, on an average, to as much as six hundred, in which are included such preparations as mineral waters, ampules, etc., down to ointments and extracts.



Messrs. Delegates: A wise government has to attend conscientiously to all those functions which are indispensable to the preservation of the human race, on whose increase the prosperity of a nation so much depends. These functions constitute a duty which can not be left unaccomplished without incurring in a grave dereliction. The welfare of man is the only aim of its endeavors and the only reason for its existence.

Most of the ills that afflict humanity can not be under the control of governments, but depend on the individuals themselves. Hence the necessity of teaching the people rules of hygiene, which alone make possible the rearing of a vigorous race of men, capable of successfully struggling against the calamities that wait on them in the course of life.

It is the most valuable portion of human society that in such great measure falls victim to the ravages wrought by all those diseases that are so harmful to the race; it is only natural then that governments should use an iron hand to check the spread of these evils and to remedy the consequences which bear so heavily on the welfare of future generations. For this motive, and not wishing to go at length into the great number of reasons that we could add to the foregoing considerations, which you are so highly qualified to judge and comprehend, we have ventured to submit a proposition embodying the desire of this Conference, that all the means destined to struggle against all those evils, so harmful to the welfare and future of society, should be solely in the hands of the respective Governments.

Our wish, Messrs. Delegates, has been to be present in this Conference in which you all are assembled, and to discharge personally the duties entrusted to us by the Supreme Government, which appointed us delegates from Chile to the Seventh Pan American Sanitary Conference, but due to reasons entirely beyond our control, all of us are unable to leave our country.

We express our sincere wishes, Messrs. Delegates, for the complete success of your endeavors in behalf of all our peoples, who so earnestly desire, and so confidently expect, to obtain from your learning and experience in the science of Public Health the most fruitful results.

Santiago, October 14, 1924.—Dr. Carlos Altamirano.—Dr. Manuel Camilo Vial.—Dr. Carlos Graf.

## REPORTS OF THE DELEGATION OF THE REPUBLIC OF EL SALVADOR

### THE SERVICE OF VENEREAL PROPHYLAXIS

Prostitution has been regulated in Salvador for many years.

Every prostitute is compelled to register at one of the offices devoted to this subject throughout the Republic.

For the purposes of registration, there is a Police Service of Venereal Prophylaxis, whose agents are required to watch all suspicious cases and report them to their respective offices as a preliminary to definite registration.

In the capital and in the cities of Santa Ana, Sonsonate and San Miguel, besides the Prophylaxis Offices, there are hospitals for the treatment of venereal diseases, where all the registered women are examined from time to time, and where such as require special treatment and medical attendance are admitted as patients.

It is also customary to visit patients in their homes, particularly in the case of prostitutes located in houses of toleration.

In the other departmental seats the work is conducted exclusively by the Offices of Venereal Prophylaxis, which are equipped with every requirement for examination and diagnosis, and exert medical vigilance over the prostitutes registered in their files.

These examinations are obligatory and take place twice a week, a minimum fee being charged. Treatment at the hospitals is entirely free of charge, and lasts until the danger of contagion has disappeared.

The general hospitals of the Republic conduct clinics for the treatment of diseases of the genito-urinary organs for men, and extend the use of their surgical services to women suffering from these diseases, in addition to which they conduct consultation and treatment rooms. These are called External Offices, because they admit only out-patients of the hospitals, either to receive prescriptions and medicines, to undergo examinations of all kinds, or to receive surgical treatment, as the case may be. All these services, like those rendered to the regular hospital patients, are absolutely free of charge.

The *Sociedad de Beneficencia Pública* (Society of Public Welfare) receives an important monthly subsidy, which is devoted chiefly to the support of three prophylaxis clinics for men, maintained by the institution in different sections of the capital of the Republic.

The Bureau of Bacteriology of the Rosales Hospital and the An-

nex to the General Board of Health effect a great many Wassermann reactions every week, as a means of diagnosis and prophylactic control and treatment. These reactions are made by the Hospital free of charge for its own patients, while private parties are charged a small fee for the service. The services of the laboratory annexed to the Board of Health are free to patients of all classes. This laboratory receives samples of blood from different parts of the Republic. It also exerts control over the registered prostitutes with regard to the existence of syphilis, and undertakes investigations under this head in the garrison and other military bodies of the capital.

Among the numerous private offices and laboratories of the Republic, there is one in the capital which also performs this reaction. It enjoys the full confidence of all the physicians.

#### ANTI-LARVAL CAMPAIGN AND THE CONTROL OF MALARIA

In view of the fact that malaria is one of the most prevalent diseases in El Salvador, the efforts employed for its control are the occasion of keen interest everywhere throughout the Republic, whatever be the methods of attack. These include the destruction of the larvae of the mosquitoes which transmit the disease, the protection of the people against the bite of the insect, and the systematic application of quinine as a preventive, its action rendering the bites more or less inoffensive and preventing the development of acute attacks.

The anti-larval campaign and the control of malaria are entrusted to Special Inspectors in the departmental seats which are most exposed to the infection and in the ports of the Republic. These Inspectors perform daily visits to the different settlements in search of breeding places of the larvae. Whenever they find one of these breeding centers, they proceed at once to destroy it, and instruct the neighbors on the necessity of doing away with similar nuisances. At the same time they report the matter to the General Board of Health or to the proper branch office. Should the circumstances require the imposition of a fine, the office imposes one, it being the duty of the municipal authorities to see that it is enforced.

When swamps are met with, they are regarded as potential breeding centers of importance, and as such are drained whenever this is found to be possible. When it is found impossible to dry up a swamp, whether on account of the expense of the work or owing to the peculiar conditions of the place, it is covered systematically with

a film of crude petroleum mixed with equal parts of refined petroleum, using about three spoonfuls per square metre of surface. Or, better still, an effort is made to populate the swamp with the small larvae-eating fishes known among us by the name of "*Chimbolos*" utilizing, chiefly, the four following species:

*Poecilia salvatoris*, Regau.

*Poecilia sphenojas*, Cuvier and Val.

*Poecilia elongata*, Gunther.

*Poeciliopsis pleurospilus*, Gunther.

These little fishes are also used in water deposits of some importance in private houses, for which they are supplied by the General Board of Health, particularly at times when intensive campaigns are being carried on, in which circumstances they are particularly useful owing to the voracity with which they devour all kinds of larvae, including those of the *Aedes aegypti* (*Stegomyia Calopus*), the transmitter of yellow fever.

With a view to avoid the access of the mosquitoes to water deposits of some importance, strict orders have been issued by the respective Ministries, at the request of the General Board of Health, to the departmental and local authorities requiring private parties to cover their water tanks with screens so constructed as to prevent the entrance of mosquitoes, and requiring the municipalities to adopt similar measures with regard to the reservoirs, the sources supplying the same and the tanks supplying the public water pipes. In the case of a few private parties who own large cisterns and tanks, the openings of which are too large to be covered, they have been allowed to cover the water with a coat of oil from three to five centimeters thick, which not only serves to destroy the larvae contained in the water, but also prevents it from being exposed to other centers of proliferation.

In the beginning of September last, by a Ministerial Order, a special section was created in the General Board of Health charged with the control of malaria and the anti-larval campaign, with the duty of carrying on a specially intensive campaign where the work is already in progress, and of extending it to such other localities as may require it.

In the ports of La Libertad and Acajutla the system of obligatory and free quininization of the residents of the said ports has been adopted, whenever the endemic of malaria has assumed an epidemic character. The doses employed have been of twenty centigrams of quinine hydrochloride, in the form of tablets. In the

case of persons under the force of a full attack, the dose is, of course, larger, and is continued until the hematozoön of Laveran has disappeared from the blood.

The existence of laboratories in the principal cities of the Republic has made possible the systematic examination of numerous malaria patients or carriers of hematozoa, and their proper treatment, which has been followed by a decrease in the potential sources of epidemics and effected a remarkable reduction in the number of patients.

The following are the principal species of anopheles found among us: *A. Albimanus*, *A. pseudopunctipennis*, *A. strigimacula*, *A. apimacula*, *A. torsimaculata*. Of these, the first two are the principal transmitters of malaria in this country.

As to the *Aedes aegypti*, *Stegomyia calopus* or *Stegomyia fasciata*, this species prevails throughout the territory of the Republic, where it is estimated to form eighty per cent of the existing mosquitoes.

#### GENERAL BOARD OF HEALTH, HOOKWORM DIVISION, REPUBLIC OF EL SALVADOR

#### YEAR 1916

The campaign of the Hookworm Division was begun on March 6, 1916, a few days after the opening of the Office founded by the Rockefeller Foundation, which defrayed the expenses incurred in this and other years.

Boxes were distributed to 11,727 persons, who were examined for the first time. Out of 9,975 persons 3,444 or 34.5 per cent were found to be infected with hookworm. Second examinations were performed on 2,169 persons, which brings the total to 12,144 examinations.

In the Cavalry Regiment, an infection of 88.8 per cent was found. At Apopa 50.6 per cent of the population was found to be infected, and on two coffee plantations, situated at the foot of the volcano, 76 per cent and 77 per cent respectively, were found.

Owing to the want of privies, the soil on these plantations was strongly polluted, and practically the entire working class, who go barefooted, are infected and carry the infection to the neighboring villages.

There is also a complete lack of privies on the sugar plantations, but here the conditions of hookworm propagation are less intense than on the coffee plantations, because the percentage is smaller. The sugar cane reaches no great height and requires no protection,

for which reason the soil is not shaded and damp, chiefly in the dry season, which is the time for cutting the cane; but as the laborers are of a somewhat migratory disposition, they sometimes engage in the work of cutting sugar cane, and sometimes apply themselves to coffee gathering, and so are never without an occasion to become infected.

During the year we have counted entirely on education and the persuasive influence of our efforts to bring about a sanitary reformation, for, owing to the deficiencies of our legislation, it seems that we have accomplished very little. A few privies have been built here and there, and that is about all.

Our most difficult task is to overcome the habits of the rural inhabitants, confirmed by generations, and from a financial point of view, the construction of privies constitutes a considerable burden, while in many cases the expense is really beyond their means.

At Apopa, a town of several thousand inhabitants, only 22 privies were found in a total of 209 houses visited, and while the work was being carried on, the Mayor advised this Division that he had issued an ordinance compelling all house-owners to build privies in their houses. This provision means the probable construction of some of them.

An investigation was begun throughout the Republic to determine the degree of hookworm infection in each department, in order that our efforts may be directed wherever they are most needed.

Malaria is another one of the diseases which offers one of the greatest economic problems to public health. Many cases have been observed in which hookworm is complicated with chronic malaria, for immediately after the administration of chenopodium or thymol, a malarial paroxysm ensues, accompanied by a high temperature, and it becomes necessary to suspend the treatment in order to attack the malaria, after which the treatment for hookworm is resumed.

The work of this Division, during the first months of the year, was conducted entirely at San Salvador; and the capital is almost entirely provided with sewers, while the barracks, schools, and the penitentiary are provided with privies. These are used by the greater part of the population, and while they are generally in an unsanitary condition, it cannot be denied that they contribute in some degree to prevent the spreading of the disease. But in the rural districts sewers are entirely unknown, and sanitation is one of the most urgent necessities.

It is very seldom that a properly constructed privy is met with, and in general the conditions found are particularly favorable to the development and spreading of hookworm in many districts of the Republic.

### YEAR 1917

The work of the year was carried on in the Departments of San Salvador and Sonsonate, and was constantly extended, so that at the end of the year the campaign had been carried to all the most accessible places in the Department of San Salvador. Offices were installed in villages and on plantations, and the intensive plan was carried out on persons living within the radius of the geographic area in which the work was being done. By the distribution of literature and other measures, we succeeded in awakening the interest of persons living in the neighborhood, and in persuading them to apply at our laboratories for examination and treatment on the dispensary plan. The centrifugal method was used in all the work, and about 40 per cent of the samples were centrifuged. This method requires considerable time, which may be occupied in examining other cases or giving other treatments; but as the diagnoses of about 20 per cent of the clearly positive cases of hookworm were secured through the centrifugal method, it appeared desirable to use this time rather in analysing the samples for the benefit of the patients, for otherwise without the use of the centrifuge, these cases would have been classified as negative. During the year the mayors were persuaded to issue ordinances compelling the neighbors to install privies in the interior of their dwellings. Some of them did so, and those who failed to obey the ordinances were punished with fines of from five to ten colones, but the authorities never failed to recognize that they had no power to render the fines effective, because the inhabitants had no means of paying them, owing to the poverty in which they lived.

We shall now describe the work performed during the year:

Census .....	17,165
Examined for the first time.....	14,775
Positive for hookworm, first examination.....	8,149
Took first treatment for hookworm.....	5,658
Further treatments.....	5,986
Total treatments given for hookworm.....	11,644
Treatment for other parasites.....	588
Cured of hookworm.....	2,518
Treated and not cured.....	3,140

Houses inspected .....	2,658
With privies .....	385
Without privies .....	2,273
Privies installed during the year.....	161

### YEAR 1918

In this year work was carried on in the departments of San Salvador, Sonsonate, La Paz, La Libertad, Santa Ana, Ahuachapán, and Cuscatlán, the following work being performed:

Census .....	49,564
Examined for first time.....	44,328
Positive for hookworm, first examination.....	26,580
Took first treatment.....	21,094
Further treatments for hookworm.....	17,111
Total treatments for hookworm.....	38,205
Treatments for other parasites.....	685
Cured of hookworm.....	5,642
Treated and not cured.....	15,462

Whenever a branch was opened, public lectures were delivered with the aid of moving-pictures to which the public was invited, and at the same time literature was distributed informing the people of the system of the work and the ends in view; 5,816 lectures were delivered before public audiences, in schools and in private, with an attendance of 24,064 persons and 13,822 pieces of literature were distributed.

The Government contributed 13,528 colones and 29 centavos for the work. The municipalities contributed 1,316.44 colones and private institutions gave 890.25 colones, the sum total amounting to 15,734.98 colones. To this is to be added a donation from the Superior Health Council of 25,000 quinine tablets at a cost of 150 dollars and 50 gallons of creoline, valued at 32.50 dollars.

During the year forty-five laboratories were established, and the modified intensive plan was put in practice.

In the same year, about the 18th of November, the Director of the Division, Dr. Charles A. Bailey, was appointed Honorary Director of School Health.

And on the 13th of November the Executive Power issued an order establishing as an indispensable requirement for admission to the schools of the Republic the presentation of a certificate from the Hookworm Bureau to the effect that the bearer is exempt from that disease.



## YEAR 1919

During the course of this year there were in operation twenty-four offices established throughout the departments of Ahuachapán, Chalatenango, Cuscatlán, La Libertad, La Unión, San Salvador, Sonsonate, Santa Ana and San Miguel, where the following work was performed:

Census .....	45,241
Examined for the first time.....	40,641
Found to be positive at the first examination.....	21,802
Took first treatment for hookworm.....	18,209
Further treatments, .....	20,441
Total number of treatments for hookworm.....	38,650
Treatment for other parasites.....	4,694
Cured .....	7,799
Treated and not cured.....	10,410

At Santa Ana a Hookworm Branch was established as a dependency of the Health Office, the man in charge being paid out of the funds of the municipality. Similar attempts have been made in various departmental seats, but without success.

Owing to the appearance of various cases of trachoma, the Director of the Division, in conjunction with two physicians, undertook an investigation of the inmates of the Central Penitentiary, the Orphan Asylum, pupils of schools and adults, to a total number of 4,500 persons, and found only ten positive cases of trachoma, six in an active condition and four in a state of cicatrization; but on the other hand, besides these ten positive cases of trachoma, forty-five cases of conjunctivitis were met with in school children.

In the town where the first laboratory was established in 1916, investigations were undertaken last year in order to determine how long the results of the work would last, with the surprising finding that out of 84 persons who were re-examined, and who thought themselves cured, 65 persons, or 77.3 per cent, were shown by the tests to have been reinfected. Owing to our deficient technical equipment, the beginning of the campaign was not so precise and careful as it is today, but although some of the data obtained are incomplete, they are yet sufficient to enable us to settle one of our crucial points, and to proceed without vacillation with the hookworm campaign, notwithstanding the difficulties met with, owing to a lack of cooperation and help on the part of the inhabitants and authorities, both as regards sanitation or the construction of privies

and the prevention of the pollution of the soil. In this town few houses were found with privies, and it was only after months of continual efforts, consisting of persuasion by word of mouth and education imparted in other ways, that it was found possible to secure the construction of about one hundred privies.

In places where permanent privies have been installed, they are invariably used and kept in very good condition. It is necessary for the privies to be built at no great distance from the houses, owing to the difficulty of using them in rainy weather, particularly as regards children.

At the present time, efforts are being made to secure the construction of privies in schools, in order that the children may benefit by them and become accustomed to their use, which cannot fail to have a good influence on the home and contribute to prevent the infection from reaching children of from six to twelve years of age, who are the agents of the dissemination of hookworm, because they pollute the soil in the vicinity of their dwellings.

#### YEAR 1920

The intensive plan was replaced by the modified intensive plan, the difference being that with the latter no medicines are given in the patients' homes, this work being confined to the different laboratories. The change was adopted primarily because it was found that people accepted the treatment more readily when compelled to apply for it at the laboratories than they did when it was carried to their homes by the physicians. Besides, it was found possible to examine and treat a larger number of patients in a given period, owing to the saving of time, which would otherwise be lost in effecting frequent visits, distributing boxes and administering treatments, not to speak of visits that were lost because the patient would be away from home, or would not feel inclined to take the treatment. Upon the whole, it was found that more people applied for treatment than had been reached by the intensive plan, when the assistant was kept busy carrying the boxes to the patients' homes, calling again to take them up or to apply the treatment.

The Central, or Administrative Office of the Hookworm Division, is situated in San Salvador, the capital of the Republic. The Chief of the Division and the Administrative Director have been aided during the year by a staff composed of an Attending Physician, a General Field Director (during part of the year), nine Technical Assistants, one Secretary and one Assistant Secretary.

The Superior Council of Health, of which the Hookworm Division

is a dependency, was organized about twelve years ago, but it was reorganized during this year and named the "General Board of Health," being composed of a Director General, three Attending Physicians, one Chemist, one Engineer and one Lawyer, who are each in charge of a Section or Division, and an Attending Physician, as Secretary.

First Section: Maritime Quarantine, Disinfection and Sanitation.

Second Section: International Sanitation, School Hygiene, Industrial Hygiene, Child Hygiene, and Military Hygiene.

Third Section: Vaccination, Bacteriology, Venereal Prophylaxis and Control of the Practice of Medicine.

Fourth Section: Control of Food, Municipal and Rural Hygiene, Control of Cemeteries.

Fifth Section: Sanitary Engineering, Vital Statistics, Superintendence of Railways, Police Sanitation.

Sixth Section: Legal Subjects referring to the Department.

Each dependency, division or department of the Government charged with the subjects of medicine, sanitation, and prevention through public sanitation and military sanitation will be correlated and placed under the immediate jurisdiction of the Director General of Public Health.

The Government has arrived at the conclusion that health can be bought, and that sanitation is indispensable for the progress and prosperity of any nation.

The Sanitary Code of El Salvador in many respects is ample and adequate, but some of its provisions are antiquated. It has suffered a number of alterations in recent times, but as a matter of fact, the whole Code should be revised.

Twelve of the fourteen departments of the Republic have enjoyed the benefits of the measures which were offered for the relief and control of hookworm. The two remaining departments, Cabañas and Morazán, lying in the north of the Republic, are preparing to begin presanitary campaigns, after which they will take up the work in the first months of the coming year.

During the year there were laboratories in operation in several departments, to wit: La Unión, San Miguel, Usulután, San Vicente, Cuscatlán and Santa Ana, besides the Central Office in the Department of San Salvador.

Whenever possible, our relief measures are preceded by a pre-sanitary campaign, consisting specially in the construction of privies. While the Code requires the construction of privies, the

requirement is rarely enforced. It has been necessary to resort to education and demonstrations. Consequently our progress was at first very slow. At present, however, we have reason to feel greatly encouraged, because in the course of the year a much larger number of privies were built than in the first years of our campaign.

Before opening a laboratory in any part of the country a circular letter is sent to the department governors and mayors, explaining the dangers of hookworm, the scope of our work, what we are prepared to do, and what is expected of the municipalities. Then they are supplied with literature, posters, advertisements and models of privies, extracts of the Sanitary Code and Police laws.

Whenever it is thought desirable to open a branch in any settlement, an effort is made to secure the provision of privies in at least 60 per cent of the houses in the village. In some cases it has been possible to secure the installation of privies in 100 per cent of the houses, and it has often been found that when this figure is not reached it is due to the fact that the inhabitants are too poor to meet the expense.

On the night before an Office is to be opened, a public lecture is delivered, either with or without the aid of magic lantern slides, sometimes in a theatre, sometimes in an appropriate building and sometimes in the open air, but usually a park is preferred. While the lecture is being delivered, a distribution of printed matter is effected, and the hearers are urged to apply at the Office to be examined and treated. At the laboratories short talks are given on hookworm, on polluted soil and on sanitation, and charts are shown and explained as well as the microscope, in which the visitors are permitted to see the eggs and larvae.

For the work of the year, the Government appropriated 52,050 colones as follows:

For the installation of the offices of the Hookworm Department in the cities of Santa Ana, Sonsonate, Cojutepeque, Zacatecoluca, San Miguel and San Vicente.....	12,250
For the maintenance of the offices at the rate of 270 colones per month .....	19,800
For the general campaign against hookworm.....	20,000
Colones.....	52,050

The work performed during the year was as follows:

Census .....	39,081
Examined for the first time.....	36,172
Positive for hookworm.....	19,710
Received first treatment.....	17,180
Further treatments .....	19,575
Total number of treatments.....	36,755
Treatments for other parasites.....	15,243
Cured .....	7,144
Treated and not cured.....	10,036

*Technique of the examination.* The method of smearing the liquid is practiced in all examinations. A small piece of excrement is placed on a glass slide measuring 3 inches by 2 inches, to which is added a small quantity of water. Then the water and the excrement are mixed by means of a small stick with flat sides.

Every sample is examined without centrifuging, but whenever a negative result is found on two slides, the sample is centrifuged and examined again twice before being declared negative. The same technique is applied in all cases coming up for re-examination.

#### YEAR 1921

During the year laboratories were operated in the departments of Cabañas, Chalatenango, Cuscatlán, La Paz, La Unión, Morazán, San Vicente, and Usulután, besides the Central Office at San Salvador.

The percentage of infection in these places was 15 per cent higher than in those where previous work has been carried on.

During this year the system of examination was changed, and Willis' floating method was adopted (solution of sodium chloride), which is more practical, economical and positive.

Hookworm patients who were not cured with three treatments with chenopodium were given thymol alternately until a cure was insured.

The chenopodium and thymol were given in gelatine capsules, except in the case of children, when the chenopodium was given mixed with syrup.

In view of the great number of cases of infection with ascarides, it was decided to administer to all patients having this parasite three consecutive treatments at intervals of eight days.

The work done during the year was as follows:

Census .....	50,548
Examined for the first time.....	45,800
Found infected with hookworm on the first examination.....	26,107
Received first treatment.....	32,248
Further treatments .....	26,213
Cured .....	10,384
Treated but not cured.....	12,863
Total number of treatments for ascarides.....	16,111

#### YEAR 1922

At the end of the year 1921 there had been examined in the various laboratories established in different settlements of the Republic 188,283 persons, of whom 103,745 or 55 per cent were found to be infected with hookworm. Of the infected persons 84 per cent took one treatment and 61.8 per cent took two or more treatments.

On May 18 the Executive Power caused to be published in the "Diario Oficial" No. 110, a set of regulations on the construction of privies, requiring the existence of privies even on farms; but owing to the elections the Government has been compelled to temporize and attend to innumerable representations against the measure.

The lowest infection of hookworm in the Republic is found in Apaneca, in the department of Ahuachapán, with 37.7 per cent, while the highest is found in the same department, in the town of San Francisco Menéndez, with 89.7 per cent.

During the year several laboratories were re-established in those towns in the departments of Santa Ana and Ahuachapán, where during three or four consecutive years measures had been taken for the control of hookworm. The following table is a statistical record of the re-establishment of the laboratories, showing the percentage of the infection of hookworm found when the offices were first established, together with the percentage of infection met with since that time in 1922, as well as the percentage of houses provided with privies when the campaign was first begun, and the percentage of houses that were found to be provided with privies when the laboratories were closed at the termination of the work.

During this year, greater impulse was given to the work of installing privies, and from the satisfactory results now being obtained it is hoped that in the next few years there will be very few houses without them. This hope is further justified by the interest

shown by the parties themselves in the progress of the work; for the difficulty arises, not from the people, but from the lay of the land, which is not at all favorable for the execution of sanitary works.

### LABORATORIES REESTABLISHED IN 1922

<i>Geographic Areas</i>	<i>Percentage of Infection in</i>					<i>Percentage of Houses with Privies before the work began</i>	<i>Percentage of Houses with Privies at the end of 1922</i>
	<i>1918</i>	<i>1919</i>	<i>1920</i>	<i>1921</i>	<i>1922</i>		
Ahuachapán .....	—	60.0	—	—	73.3	35.2 in 1919	96.2
Apaneca .....	37.2	—	—	—	37.7	11.9 in 1918	78.6
Ataco .....	—	55.0	—	—	66.2	10.0 in 1919	95.0
Atiquizaya .....	61.4	—	—	—	68.2	20.2 in 1918	96.1
Chalchuapa .....	49.9	—	—	—	69.4	44.5 in 1918	99.0
Coatepeque .....	69.5	—	—	—	77.6	23.2 in 1918	85.0
Izalco .....	61.3	—	—	—	79.4	None in 1918	22.2
Juayua .....	45.8	—	—	—	51.4	None in 1918	74.9
Metapán .....	—	68.2	—	—	73.3	16.0 in 1919	56.9
Nahuizalco .....	54.5	—	—	—	74.1	2.3 in 1918	11.6
Santa Ana .....	—	62.3	69.6	58.7	48.5	Is increasing	89.3
Salvador .....	40.0	38.1	41.4	33.4	48.9	Is increasing	96.4
San Pedro Pux.....	63.1	—	—	—	—	1.4 in 1918	76.9
Sonsonate .....	—	64.5	—	—	70.4	42.2 in 1919	83.0
Tacuba .....	—	75.6	—	—	82.3	8.0 in 1919	97.2
Texistepeque .....	—	74.0	—	—	73.5	5.0 in 1919	20.2

The work performed during the year was as follows:

Census .....	55,557
Examined for the first time.....	51,747
Positive for hookworm, first examination.....	33,454
Received first treatment.....	29,334
Further treatments .....	45,956
Treatments for ascarides.....	10,716
Cured of hookworm.....	13,400
Treated but not cured.....	15,934

In the beginning of the year the first steps were taken toward the establishment of the Secretariat of Sanitation, which was strongly supported by Dr. Luis V. Velasco, Director General of Health at that time.

The office cooperated during six months with the Government in the campaign against yellow fever, and in the active campaign against larvae, through which malaria was considerably reduced and mosquitoes were eliminated.

Dr. Robert Lambert visited the country and delivered several lectures at the National University.

Dr. D. Bruce Wilson, who was on his way to the Republic of Hon-

duras in the capacity of Director of the Hookworm Department, passed through the country.

In January of the same year, Dr. Charles A. Bailey was granted the title of Honorary Member of the National University.

The use of the new drug called "Carbon Tetrachloride" was introduced in the treatment of hookworm.

### YEAR 1923

Besides the permanent laboratory established in San Salvador, thirty-four traveling laboratories were conducted in different places of the five departments of the Republic, but our most extensive work was carried on in the departments of La Libertad and Sonsonate, and recently in that of San Salvador. At the present moment the land is being gone over for the second time.

All the branches are conducted in a transitory manner, and are kept open to the public only as long as they are deemed necessary, as shown by the demand.

At the end of our report we shall include in two appendixes the data regarding the work conducted from 1916 to December 31, 1923.

A large number of persons were examined, treated, and apparently cured in former years, and approximately the same personnel and the same expense have been reduced to those of former years.

In several towns of the Republic a number of measures were put in practice which entailed extensive modifications in the application of the remedy, and which contributed to the extinction of hookworm. In each town containing a sufficient number of infected persons, offices were established with laboratories. In places where it was found difficult to establish an office, the inhabitants were treated through traveling dispensaries.

Thymol and chenopodium were given internally, the chenopodium being applied in the greater quantity, and when three treatments of this remedy were found insufficient to cure the patient, he was given thymol for the fourth treatment, and thereafter he was given chenopodium and thymol alternately until cured.

On May 21 of this year, the new medicine called "Carbon Tetrachloride" began to be employed at all the branches; its efficacy leaves no room for doubt, and it is superior to the other two, for it has been found that with the application of this new medicine in two treatments it is possible to obtain from 90 to 95 per cent of cures, while with chenopodium, even when applied three times the cures did not exceed from 55 to 60 per cent. Another advantage of this drug is the price, which is much lower than that of the



other two, but it is very volatile.' Carbon tetrachloride is given either mixed with chenopodium or alone.

Before reexamining a patient, whenever chenopodium is administered, the treatments are given with an interval of from eight to ten days, but this period is increased to twenty-one days when carbon tetrachloride is employed.

The usual doses have been carefully studied, and every possible precaution has been taken to avoid accidents, and in this way we have been able to carry on the work with success, for the patients have entire confidence in our medicines.

To attend exclusively to the construction of privies is almost impossible, owing to the continual and open opposition of the people and even of the authorities, as well as to the lack of the means of progress. If the construction of privies has been required, it has been in obedience to the Law, and very little progress has been made in the elimination of hookworm, owing to the danger of reinfection of persons who had been cured through the action of medicine; to which it is to be added that the disease is liable to be propagated by infected persons who have never been treated at all.

Our propaganda was carried on as actively as possible without exciting the hostility of the people, who were held to the strict fulfillment of the Sanitary Law which the government caused to be enforced with the cooperation of all others.

The popular estimate of the social value of our campaign, the general regard in which our microscopists are held, the good-will of the legislative and municipal bodies, as well as that of the citizens in general, have been important factors in the progress of our work.

The employees of this Department are anxious to obtain the cooperation of the authorities, in order that these may witness the success of the campaign, which depends on them as well. The employees can cause people to be examined, treated and cured, and they can also give instructions as to how privies should be built; but it rests with the authorities to see that these provisions are carried out.

The work performed during the year was as follows:

Census .....	72,840
Examined for the first time.....	58,589
Positive for hookworm.....	40,883
Received first treatment.....	36,884
Further treatments .....	38,247
Treatments for ascarides.....	36,329
Cured of hookworm.....	7,749
Treated but not cured.....	29,135

**GENERAL SUMMARY OF THE WORK PERFORMED BY THE HOOK-  
WORM DEPARTMENT OF EL SALVADOR DURING THE PERIOD  
FROM MARCH 6, 1916 TO DECEMBER 31, 1923.**

**SUMMARY BY DEPARTMENTS**

<i>Departments</i>	<i>Census</i>	<i>Examined First Time</i>	<i>Infected Hookworm</i>	<i>Per Cent of Infection</i>	<i>Number of Treatments</i>	<i>Per Cent of Treatments</i>
San Salvador	96,868	92,510	44,010	47.5	36,651	83.2
Sonsonate .....	37,414	32,583	21,782	66.8	17,908	82.2
La Paz .....	14,022	12,630	8,301	65.7	6,891	83.0
La Libertad...	36,587	32,935	23,428	71.0	20,725	92.3
Santa Ana.....	46,279	41,003	24,706	60.2	21,054	85.2
Ahuachapán...	29,618	27,195	18,995	62.4	16,836	89.1
Cuscatlán .....	9,915	8,940	6,027	67.4	5,300	87.9
Chalatenango	8,955	8,268	5,770	69.7	5,260	91.1
La Unión.....	4,957	4,094	2,397	58.5	1,983	82.7
San Miguel....	8,798	7,792	3,639	46.7	3,091	84.9
Usulután .....	15,631	14,310	9,020	63.0	8,034	89.0
San Vincente	10,594	9,412	5,863	62.2	5,292	90.2
Cabañas .....	7,601	6,872	3,702	53.8	3,350	90.4
Morazán .....	5,866	5,239	3,176	60.6	2,862	90.1
Total .....	333,105	303,783	180,816	59.5	155,237	85.8

GENERAL SUMMARY OF THE WORK PERFORMED BY THE HOOKWORM DEPARTMENT OF EL SALVADOR  
COVERING THE PERIOD FROM MARCH 6, 1916, TO DECEMBER 31, 1923.

<i>Years</i>	<i>Census</i>	<i>First Examination</i>	<i>Positive for Hookworm</i>	<i>Re-examinations</i>	<i>Total Examinations</i>	<i>First Treatments Hookworm</i>	<i>Further Treatments</i>	<i>Total Treatments</i>	<i>Treatments for Ascariades</i>	<i>Cured</i>	<i>Treated but not Cured</i>
1916	11,727	9,975	3,444	2,169	12,144	2,946	4,581	7,527	0	1,311	1,635
1917	18,547	16,552	8,836	3,436	21,988	6,342	6,945	13,287	632	3,096	3,321
1918	49,564	44,328	26,580	9,912	54,240	21,094	17,111	38,205	685	5,642	15,462
1919	45,241	40,620	21,802	16,466	57,086	18,209	20,441	38,650	4,694	7,799	10,410
1920	39,081	36,172	19,710	15,339	51,511	17,180	19,575	36,755	15,243	7,144	10,036
1921	50,548	45,800	26,107	20,730	66,530	23,248	26,213	49,461	16,111	10,384	12,863
1922	55,557	51,747	33,454	25,464	77,211	29,334	45,956	75,290	10,716	13,400	15,934
1923	62,840	58,589	40,883	12,777	71,366	36,884	38,247	75,131	36,329	7,749	29,135
Total	333,105	303,783	180,816	108,293	412,076	155,237	179,069	334,306	84,410	56,525	98,796

**CONSTRUCTION OF PRIVIES IN PLACES WHERE BRANCHES  
HAVE EXISTED**

1916 .....	40
1917 .....	161
1918 .....	2,465
1919 .....	1,166
1920 .....	3,446
1921 .....	1,800
1922 .....	3,174
1923 .....	4,492
1924 (figures for 9 months only).....	4,230

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Total.....	20,974
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TWENTY THOUSAND, NINE HUNDRED AND  
SEVENTY-FOUR PRIVIES

REPORTS OF THE DELEGATION OF THE UNITED STATES  
OF AMERICA

## TUBERCULOSIS

Tuberculosis is a problem of increasing rather than diminishing importance. The World War demonstrated an element of weakness in the present means of control of this disease. When the people of a nation are faced with conditions of exposure, labor, strain, diminished food supplies, all of which accompany war or other serious national calamity, the gain which has been made in the suppression of tuberculosis is materially checked and partially nullified.

For the past twenty years or more control measures against tuberculosis in the United States have been rather actively carried out by a number of official, quasi-official, and private organizations. The U. S. Public Health Service has been actively engaged in suppressive measures, partly through the medical examination of arriving aliens, enforcement of national and interstate quarantines, and the licensing of laboratories manufacturing serums and vaccines. The problem is also approached by the Public Health Service through the operation of government hospitals that care for the tuberculous amongst the seamen, Government employees and ex-service men.

The tuberculosis problem has also been vigorously attacked by the National Tuberculosis Association, by the American Sanatorium Association, the Metropolitan Life Insurance Company, the Russell Sage Foundation, and various other public-spirited organizations. The establishment of fresh air or out-door classes by different educational organizations is one phase of the work to which considerable attention has been paid.

It would be exceedingly difficult to estimate the total number of cases of tuberculosis in the United States, since morbidity statistics in this regard are admittedly imperfect. In the investigations carried out at Framingham, Massachusetts, covering a period of five years and embracing a population of some fifteen or twenty thousand persons, it was estimated that one per cent of the population had active tuberculous lesions and that, considering the quiescent cases, there possibly may have been two per cent of the population infected.

There can be no doubt, however, that the mortality from this disease has decreased in recent years. Statistics pertaining to the mortality from pulmonary tuberculosis in the ten "original" registration states in the United States, shows that the annual rate per 100,000 population fell from approximately 175 deaths in 1900 to somewhat less than 100 deaths in 1920. Statistics taken in twenty-four states

covering a period from 1915 to 1921 show that mortality from tuberculosis fell from approximately 120 deaths per 100,000 population to 80 deaths. This decrease, however, was not uniform. In certain years, notably 1918 and 1919, there was even an increase of the death rate from tuberculosis over 1915.

### *Propaganda*

The educational campaign or propaganda which has been carried on by governments and voluntary agencies alike has had great influence in improving the general health of the population and in this way has reduced the morbidity and mortality from tuberculosis. We are still, however, in doubt as to the relative importance of the different activities used and still in doubt as to whether improved conditions of wage, food and sanitary comfort may not be justly credited with part of the disappearance of this illness. There are notable examples of the possibility of rapidly reducing the mortality from tuberculosis in communities by the combined effort of government and voluntary agencies, but the limit of control is soon reached and cannot be exceeded with our present knowledge, and is not maintained in the presence of emergency such as war or famine.

### *Common Host in T. B. Strains*

The increasing evidence of the relation which the different strains of tubercle bacilli have to each other and the possibility of intercommunicability through a common host is also assuming new importance. Such a possibility is evidenced by the pig which is a host for human, bovine and avian bacilli, each of which is capable of producing tuberculous disease in this animal, and it may transfer the organism to a species for which it is more virulent.

### *Cooperative Study*

These facts have awakened a renewed effort in the study of this disease, and the United States Public Health Service, in conjunction with the National Tuberculosis Association, has undertaken the task of mobilizing the National facilities for research in this field and securing their assistance in working out a program which will fill in the gaps in our knowledge of this sickness. These facilities, in addition to the Hygienic Laboratory of the United States Public Health Service and the laboratories of the Bureau of Animal Industry, are mainly found in the laboratories of our large Universities and the Research workers there. The work is being carried on by a small committee of expert men in this field, composed of representatives of the

United States Public Health Service and the National Tuberculosis Association.

### *Problems*

Among the problems that are now being studied in the extra-governmental laboratories are:

1. The element in Tuberculin responsible for the tuberculin reaction. (Chicago and Yale Universities.)
2. The origin and function of the epithelioid cell. (Johns Hopkins University.)
3. The origin and nature of fibrous or scar tissue. (Yale University.)
4. The relation of Bovine tubercle bacilli to childhood and healed lesions. (University of Pennsylvania.)
5. The vascular anatomy of the lungs and other organs in relation to the spread of tuberculosis in the body. (University of Wisconsin.)
6. Normal x-ray lung photographs. (Universities of Johns Hopkins, Pennsylvania and Cincinnati.)

These are in addition to the work in our government laboratories, which have their own problems as part of the National program.

### *Present and Future*

This represents the present trend of cooperative study in the United States, where it is felt that, while the educational work must be continued and there is an enormous task still for it to do, its limits with our present knowledge have been demonstrated, and there is a necessity for more accurate data before the task can be completed.

The work of the Hygiene Laboratory of the United States Public Health Service in tuberculosis is part of the National program on research which is outlined in another part of this report. These researches are on the following phases of the work:

1. The relation between the Epithelioid cell (which forms the mass of the tubercle) and the Endothelial cell which lines the vascular channels of the body by which the tubercle bacillus travels.
2. The relation of blood fibrin to fibrous or scar tissue which latter is the element of the tubercle most prominent in the healing of tuberculosis.
3. The possibility of modifying the growth characteristics and virulence of tubercle bacilli by immune sera.
4. The influence on Tuberculous Infection of certain necessary elemental food substances.

5. The influence of certain pure products of animal metabolism on the local tuberculous process (i. e., histamin).

These researches are in addition to the routine work of the Laboratory in supervision of proposed remedies.

It will be seen by the above outline that the researches of the Hygienic Laboratory are mainly concerned with the reaction of the host to this infection. This phase of the subject is one that has been in a measure neglected in the past few years, and has again been revived with the progress which has been made in other departments of biology by new methods and observations.

The three most striking elements in the host reaction are the Epithelioid cell, the Reticulum and white fibrous tissue and the lymphocyte.

The origin of the epithelioid cell is still a matter of conjecture. Whether it comes from lymphatic endothelium or blood capillary endothelium or a special contribution of the spleen or from the so-called fixed connective tissue cells of the body is as yet undetermined. Its multiplicity of names in the literature signifies the indefinite character of the knowledge. Until the question is settled the host reaction will not be understood. Our researches are designed to help clear this question.

The early appearance of Reticulum in the tubercle and its later transformation into scar tissue and healing, and the origin which this probably has from blood fibrin and blood clotting, forms the basis of the second series of researches. They are concerned with modification of the clotting power of the blood of living animals infected with tubercle bacilli.

The influences of necessary elementary food substances, especially the vitamins, have already been published.

The influence of the products of animal metabolism on tuberculosis is an endeavor to hasten the process of caseation which is so characteristic of advancing tuberculosis. The substance which so far has been found to have a marked effect in this regard is histamin. This substance is also known to affect in some way the function of capillary endothelium, and is powerful in the production of shock. It apparently markedly increases the process of caseation.

This is not the time to report on the details of these researches, but they are presented as an outline of the work of the Hygienic Laboratory in this field and emphasize the beginning of cooperative study in tuberculosis as part of the present Federal program.



## REPORTING OF COMMUNICABLE DISEASES IN THE UNITED STATES

The reporting of cases of communicable diseases within the several States of the United States is controlled by the State Legislatures rather than by the Federal Government.

All of the States, by law, or by regulations authorized by law, make the reporting of cases of communicable diseases obligatory. The diseases required to be reported are not the same in all the States, and the manner of reporting is not uniform throughout the country. Generally cases of reportable diseases are reported by physicians to local health officers, whose jurisdiction is a city, town, or a county. These officers report to the State health officer, who reports to the Public Health Service.

In the health departments of 43 states, officers of the state departments have been appointed as Federal officers for the purpose of facilitating the collection and forwarding of the reports required by the Public Health Service. More than four thousand local health officers have been given Federal appointments for the same purpose. This enables the Public Health Service to supervise and keep in close touch with the work of collecting morbidity reports throughout the country.

The Surgeon General is authorized by law to prepare and distribute suitable forms for the collection of morbidity and mortality statistics, and most of the data received by the Public Health Service are received on these blanks.

Morbidity reports are far from complete or satisfactory, but much progress has been made in the last few years, and each year shows improvement in the reports received.

## USE OF CALCIUM HYDROXIDE IN WATER OR ON LAND IN DESTROYING MOSQUITO LARVAE, OR PREVENTING THEIR PROPAGATION

Calcium hydroxide has never been used by the U. S. Public Health Service as a routine mosquito larvicide, although it has been the subject of special study on several occasions under both natural and artificial conditions. The better known and more effective agencies, such as oil spray of kerosene, kerosene mixed with heavy oil, nitre cake in fire barrels, or Paris green (with respect to *Anopheles*), have been the ones most generally used.

In 1921 observations were conducted by officers of the Public Health Service in the southern part of the State of Georgia for the purpose of determining the effectiveness of calcium hydroxide as a mosquito larvicide in fire barrels. It was found that lime when used in large quantities, 5 pounds to each 50-gallon barrel, apparently prevented

mosquitoes from laying eggs in those receptacles. However, it was found desirable to thoroughly stir up the excess of lime that collected in the bottom of the barrel, at intervals of two weeks. By using this rather large quantity of lime and agitating the water at two-week intervals, the barrels were kept free from larvae for a period of four months.

Under laboratory conditions a teaspoonful of fresh lime in a half pint of water containing a hundred larvae gave the following result: After thirty minutes no noticeable effect; at the end of an hour the number of larvae appeared affected; and on the following morning (more than twelve hours interval), one-half the number were dead. All the controlled larvae were alive.

It is the opinion of practical workers in malaria prevention in the United States that there are several other mosquito larvicides more effective, easier of application, and less expensive than calcium hydroxide.

None of the disease-carrying mosquitoes in the United States deposit their eggs on land. For this reason the use of calcium hydroxide on land in the hope of destroying mosquito larvae seems to be an entirely futile procedure in the United States.

#### MEMORANDUM ON THE SOCIAL AND SANITARY ASPECT OF LEPROSY

The United States maintains two leprosaria for the care and treatment of lepers. One leprosarium is located at Carville, Louisiana, and is operated by the U. S. Public Health Service. Another leprosarium is located in the Hawaiian Islands. While this institution is maintained by the Territorial Government, the U. S. Public Health Service participates in the treatment of the cases and conducts investigations of probable remedies.

There is little, if any, evidence to support the assumption that lepers existed in America before its discovery by Columbus. It seems probable that leprosy was introduced from Asia directly by Orientals who infected the Pacific Islands as commerce and immigration proceeded eastward. It is also possible that a certain amount of infection may have been introduced from European sources, especially the foci in Canada in the region of the St. Lawrence River.

It appears that Cartagena was the center of the slave markets of the Spanish Main and it was at Cartagena that the first leprosarium in the New World was established, in the seventeenth century, for the control of the infection, introduced presumably by slaves from Africa. The first leper of sufficient social prominence to receive mention in

the history of the New World was Gonzalo Jiménez de Quesada, founder of the city of Bogotá, who was declared a leper in 1573.

It is of interest to note that 250 years ago steps were taken with a view of preventing the spread of leprosy, and Philip the Fourth, in 1677, signed a royal edict in Madrid, which literally translated, follows:

“We order and command our Governor of the City of Cartagena of the Indies that, when any person has been attacked by this disease and is to be carried to the hospital at St. Lazarus, set part for the care of the malady, there be carried to the hospital with such person the furniture which was in his possession and use when he was attacked by the disease, in order that this contagion may not be passed on to others.”

In spite of the early recognition of the contagiousness of the disease, it spread from the several ports of entry until, at the present time, it exists in nearly every country of this hemisphere. It is estimated that there are more than 50,000 lepers in America.

Whether it is actually increasing, or whether an increased number of cases are being detected because of greater activity by Governmental agencies is a matter of speculation.

While leprosy has always been one of the quarantinable diseases of the United States, very few of its states have reported and segregated all lepers within their respective boundaries. There are, therefore, no reliable statistics as to the exact number of lepers in the United States of America, although it has been estimated that there are approximately 1,200 lepers within the continental limits of the United States. In 1917 Congress set aside some money for the establishment of a national home for lepers, to be conducted by the U. S. Public Health Service. Under the same authority the Surgeon General of the Public Health Service was directed to prepare rules and regulations pertaining to the apprehension, detention, treatment and discharge of lepers. The entrance of the United States into the World War served to delay action and it was not until 1921 that the National Leprosarium was established. In that year the Federal Government purchased from the State of Louisiana the State Leprosy Home and proceeded at once to remodel and enlarge it, so that the facilities might be sufficient for all lepers in the United States. There are at present 425 lepers in the National Leprosarium, and as soon as funds become available it is expected that the leprosarium will be still further enlarged, so that ultimately all lepers within the United States of America may be isolated in that place. The leprosarium includes some 36 cottages, each structure having private rooms for

twelve patients. These buildings have recreation facilities, with electric lights, steam heat, and modern plumbing.

A central kitchen is in operation, equipped with modern cooking appliances, and patients are served by the cafeteria system. Dishes and table-ware are washed and sterilized in a mechanical washer.

Two chapels are maintained, one for Catholics and one for Protestants, and a resident chaplain is provided for each faith. A small school is operated for the benefit of the leper children and for such illiterate adults as may care to attend. The leprosarium is a self-operating unit, maintaining its own power plant, heat, light and refrigeration, together with a modern steam laundry and facilities for disinfection. The fertile nature of the soil, together with the mildness of the climate, renders practicable the raising of fruits and vegetables for the maintenance of the patients, as well as a herd of cattle for beef and dairy purposes. While it is not anticipated that the leprosarium will ever become self-supporting because of the impracticability of selling farm products to the general public, at the same time the farm and dairy products very materially reduce the cost of maintenance. The administrative personnel of the hospital consists of an officer of the U. S. Public Health Service, and a nursing staff composed exclusively of Sisters of Charity in the Order of Saint Vincent de Paul. A number of patients are trained for duties as orderlies under supervision of nurses, and a large part of actual nursing is performed by patients under the direction of nurses.

Bearing in mind that the morale of the leper has considerable influence on the progress of his disease, as well as influencing his attitude towards segregation and the isolation from family and friends, every effort has been made to furnish facilities for amusement and diversion to the patients. Motion pictures are exhibited three nights weekly, and radiophones, player pianos, and phonographs likewise add to their entertainment. There is also an orchestra composed of patients, and tennis and baseball offer opportunity for considerable rivalry amongst those inclined toward outdoor sports.

Section II of the Act of Congress, which provides for the care and treatment of persons afflicted with leprosy in the United States, directs, in substance, that there shall be received into the leprosarium, under regulations prepared by the Surgeon General of the Public Health Service, with the approval of the Secretary of the Treasury, any person afflicted with leprosy who presents himself or herself for care, detention and treatment, or who may be apprehended under authority of the U. S. Quarantine Act, or any person afflicted with leprosy, duly consigned to said leprosarium by the proper health au-

thorities of any State, Territory, or the District of Columbia. The Surgeon General of the Public Health Service is authorized, upon notice from said authorities, to send for any person afflicted with leprosy within their respective jurisdiction and to convey said person to the leprosarium for detention or treatment, and when the transportation of any such person is undertaken for the protection of the public health, the expense of such removal shall be paid from funds set aside for the maintenance of said leprosarium.

At stated intervals, physical and bacterioscopic examinations are made and patients showing clinical improvement are segregated so as far as possible, from their fellows. After repeated examinations, any leper who has shown clinical improvement for a year and has not, within that time, been found bacterioscopically a leper, is placed under special observation for a period of two years, at the end of which time he is given final consideration. Should he successfully pass this examination, he is recommended for parole and released, subject to further examinations by his State health officers once each six months for a period of three years. Should his condition continue to be satisfactory, he is given final discharge as a case of arrested leprosy, no longer a menace to the public health.

The medical treatment of patients in the leprosarium is largely experimental, since no one form of medication has been recognized as specific. Crude chaulmoogra oil and its refined products have been administered for a number of years with varying but not entirely discouraging results.

With the newer methods of administering Roentgenotherapy, the X-Ray has been again used experimentally in an attempt to control certain of the skin manifestations of leprosy, but the experiments have not been productive of consistently good results. The application of X-Ray to the paths of superficial nerves has been productive of considerable amelioration of the exceedingly painful neuritis common to anesthetic leprosy.

A Physiotherapy clinic has recently been developed and equipped with modern appliances for the experimental treatment of the deformities of leprosy. It is anticipated that some relief, of such lesions as claw hand, wrist and foot drop, will be obtained from the use of electro, mechano and hydro-therapy.

A well-equipped laboratory is maintained for the carrying on of routine examinations and for research into the therapeutic, bacteriologic and allied studies of leprosy.

The consensus of opinion among leprologists, as expressed in the resolution of numerous conferences, and in monographs on the subject,

is that leprosy is a dangerous, communicable disease, and that, in the light of our present knowledge, segregation of all lepers is essential to the complete eradication of the disease. The drastic action necessary to accomplish this problem of vital importance is handicapped in most countries of the world not only by the lack of adequate legislation for the complete isolation of lepers and the great difficulties to be overcome in breaking strong social ties and the customs of the lepers as individuals or classes, but by the prospective expenditure of tremendous sums of money with which to maintain the segregation.

It is recognized that each country is confronted with the solution of a leper problem and that methods which appear to be applicable in one community are not practicable in another.

Rigid segregation of all lepers in the United States is an ideal toward which the health authorities are lending every effort; the achievement of the ideal, however, will be at a considerable sacrifice, social and economic.

In Hawaiian territory the Territorial Board of Health and the U. S. Public Health Service work in cooperation at the Kalihi Receiving Station. Some of the cases present themselves voluntarily, others are apprehended by the police as suspects, some of the cases are reported by other persons, and some are reported by the attending physician. All cases so reported are investigated, and the suspect is brought at once to Kalihi Hospital for examination, and if the tentative diagnosis is confirmed he is admitted to the Kalihi Station for treatment.

The most promising treatment in recent years observed at the Kalihi Station consists in the injection of the ethyl esters of the fatty acids of chaulmoogra oil, with one per cent of iodine added. The esters are prepared by the Public Health Service at the University of Hawaii, under the supervisory charge of Dr. A. L. Dean and Professor Richard Wrenshall, both of whom are Consulting Chemists of the U. S. Public Health Service. A description of the manufacture of the esters is contained in the Public Health Report of June 9, 1922. The esters are administered intra-muscularly, regularly on Wednesday of each week; the initial dose is 0.5-cc. and this is gradually increased to a maximum of 3-cc. for adults. Formerly a maximum dosage of 5-cc. was used, but the smaller dosage appears to produce as good results, if not better than the maximum dose of 5-cc. The iodine lessens local irritation and promotes absorption. A comparison of series treated with plain and with iodized esters shows that the plain esters had the same effect on the disease as the other product, but

caused more local pain and a greater tendency to induration at the site of the injection. Children require a relatively smaller dose than adults.

Some studies have been made to determine whether there is one particular acid in chaulmoogra oil that is more effective than the others, but thus far the esters of isolated acids have given results that are somewhat inferior to the esters of the mixed acids.

Studies have been made to test the efficacy of colloidal antimony and amino-arseno-phenol but these agents have given no results that warrant their consideration when compared with results obtained by the use of chaulmoogra oil derivatives.

As regards the amenability of leprosy to treatment, much depends upon the stage of the disease when the patient comes under treatment. For the two years, July 1, 1921, to July 1, 1923, 23.5 per cent of the lepers under observation and treatment at Kalihi Hospital for a period of six months or longer were paroled, and 3.67 per cent died. During this period, of thirty-four cases (classified as incipient), under treatment, twenty-three were paroled, ten were improved, and one remained stationary. Of 114 classified as moderately advanced, forty-two were paroled, two died, fifty-nine improved, ten were stationary, and one became worse. Of 135 cases classified as advanced, twelve were paroled, ten died, one was discharged, forty-eight improved, forty-nine stationary, and fifteen became worse. It is hardly necessary to comment upon these figures to emphasize the importance of the early diagnosis and treatment of lepers.

From a sanitary and social point of view it is believed that the most important line of activity to be followed in combating leprosy is the education of the people as to the contagiousness of the disease, the early evidence of its presence, its amenability to treatment, and the probable methods of transmission of the disease.

The methods of transmission are probably multiple, and we know comparatively little of the actual modes of transmission, but we do know beyond a reasonable doubt that every case of leprosy receives its infection from a previous case, though the connection cannot always be established. It is also definitely known that heredity is not a factor in the perpetuation of leprosy. In 1908 the Board of Health of Hawaii inaugurated the policy of removing children born of leprous parents in segregation and immediately after their birth transferring them to clean surroundings. During the fifteen years, July 1, 1909, to July 1, 1924, 219 children were born of leprous parents in the Molokai Settlement. Seventy-eight died before reaching the age of three years; one developed lesions that were considered leprous before

she was two years old and was declared a leper at that time; eight years later, however, she did not show any evidence of leprosy. The remaining 140 children have never shown any evidence of leprosy.

It should be pointed out that in an educational movement on leprosy the education of the medical profession should not be overlooked, for the profession in many countries is not as well informed upon leprosy as it should be. This is particularly true of the profession in the United States.

Leprosy and tuberculosis are so analogous in many ways that it seems that an educational campaign against leprosy should be as successful as that against tuberculosis, which began about twenty years ago in the United States.

From the sanitary and social standpoint, the segregation of lepers is an important consideration. For the usual leper from the lower classes, segregation is almost essential for the protection of his family and others. Where the breadwinner of a family is afflicted, segregation may bring a hardship upon the unfortunate patient and all his dependents. If he is of a higher type, who can be relied upon to conscientiously observe restrictions placed upon him at home, the sanitary authorities may do well to allow him to remain out of absolute segregation. However, in some countries, like the United States, where the fear of the disease is great, a leper usually finds it impossible to obtain work if his disease is recognized, and in such cases the patient becomes a burden to those he is trying to support. If the attitude of the public will tolerate modified segregation, as practiced in Norway, this is probably the most expedient procedure to adopt. From the standpoint of the patient only, segregation offers the best chance of arrest of the disease.

Segregation of lepers must be made reasonably attractive, for it must be remembered that most of them are capable of performing their usual work and their mental condition is not impaired. They are deprived of their liberty for the good of the public and it is therefore incumbent upon the public to see that they are provided with reasonable comforts of life, or means of earning such livelihood as will enable them to obtain the same. In Hawaii, segregation has been made so attractive that some refuse to leave segregation even though they have achieved an arrest of the disease and can be examined for parole.

#### LITERATURE ON PARASITIC DISEASES

Recognizing the fact that the literature on parasitic diseases and their inter-relation between man and the domesticated and wild ani-



mals has so increased in extent that the subject has become difficult to follow, the U. S. Public Health Service in cooperation with the U. S. Bureau of Animal Industry has recently completed a catalogue of the parasites according to the host in which they occur. The first number, entitled "Key-Catalogue of the Protozoa reported for Man," has just been completed and companion numbers will follow in the near future. It is expected that this series will materially reduce difficulties which now confront investigators in this field of work.

### *Amoebic Dysentery*

The World War brought up the question in the United States, as well as in other countries, as to the possible spread of amoebic dysentery by returning troops. Investigations by the U. S. Public Health Service thus far have not served to detect any increase in amoebic dysentery in the United States due to returning troops.

### *Hookworm Disease*

The campaign against hookworm in the United States has been vigorously conducted for a number of years, both by the International Health Board, the U. S. Public Health Service, and by state and local authorities. Since 1908 the cases of severe infection in the United States have decreased very considerably, so that so-called "dirt eaters" are now rarely observed. Lighter cases still exist and will doubtless continue to exist for a number of years, but hookworm disease is no longer a serious problem in the United States as formerly. With respect to treatment, very favorable results have been obtained with the use of carbon tetrachloride, due primarily to the researches of Dr. Maurice Hall, of the U. S. Bureau of Animal Industry.

### *Clonorchiasis Investigations*

In June, 1922, investigations were commenced to determine whether the liver fluke disease, Clonorchiasis, would probably be disseminated and become a menace to the health of the residents of the Pacific slope of the United States.

The disease had been found in this district amongst Chinese and Japanese residents. Though a scientific confirmation of the manner of dissemination has not been concluded, presumptive evidence suggests that the causative parasite develops a part of its life cycle in fresh water, and in fresh water molluscs and fishes, reaching its maturity in a mammal (man, dog, cat, hog, rabbit, guinea pig) which has consumed the encysted larvae in fish.

The investigations made by the U. S. Public Health Service have embraced a study to determine whether the disease is widespread amongst animals or people resident on the Pacific slope of the United States; a survey to determine and collect representatives of the different families of snails of the waters of the Pacific slope; a study to determine the presence or absence of fresh water fish which have been found to be vectors of the disease; and laboratory experiments designed to effect the life cycle of the fluke (*Clonorchis sinensis*) by the use of the local molluscan and fish fauna which are most closely allied to those found to be, or presumed to be, its intermediate hosts in China and Japan.

Four hundred and fifty people have been examined, and 38 dogs, 8 cats and 1,468 hogs from a district in California in which the disease is known to be present amongst immigrant Asiatics. Amongst these none were found to be infested.

The specific snail host in Japan has not been found in the waters of the Pacific slope; however, there abound in these waters representatives of the same family group, and others. Snails of the following groups have been collected and have been used in the experiments: *Amnicolinae*, *Lithoglyphinae*, *Goniobasis*, *Lymnei*, *Planorbis*, *Physa*, *Ancylus*, and *Pompholy*. While many of these have been found to contain cercaria, none has been found infested in nature or under experimental conditions with the cercaria of *Clonorchis*.

None of the specific fish hosts has been found in the waters under investigation.

The laboratory experiments have embraced: (1) Attempts to infect animals directly by feeding with egg-bearing feces. (2) The production in aquaria of conditions which would effect the life cycle of the parasite, using the snails which abound in the local waters, and carp (*Cyprinus carpio*), the gold fish (*Carassius aurius*), and the top minnow (*Gambusia affinis*). (3) Attempts to effect the spontaneous hatching of the ova of the parasite. (4) Efforts to standardize the methods of examination of arriving aliens for the detection of the parasite.

These laboratory studies have resulted in the following heretofore unpublished findings: (1) The egg of *Clonorchis sinensis* has a shell which is embossed in a mosaic pattern. (2) The eggs are readily opened or dehisced in a greater proportion than in other snails within the snail *Planorbis*, and the empty shells found in the intestinal tract. (3) The eggs have been seen to hatch spontaneously in open dishes under the microscope, and the miracidium swim actively about. (4)

Standard methods of examination of arriving aliens have been devised and promulgated.

The experimental work is being continued along the same lines as above indicated.

CONSIDERATIONS OF INVESTIGATIONS MADE AND METHODS IN USE RELATIVE TO THE DISCOVERY OF GERM CARRIERS, AND THE PRECAUTIONARY MEASURES OBSERVED TO RENDER THEM UNABLE TO TRANSMIT INFECTION. (Resolution of the Sixth International Sanitary Conference.)

The discussion of germ carriers in this connection is understood to be confined to the consideration of convalescent or healthy persons who carry the organisms of infectious diseases; it would exclude, for example, the person suffering from infectious diseases, such as tuberculosis or gonorrhea. The subject will be considered best in relation to the specific infections.

*Typhoid Fever.*—Investigation has shown that many outbreaks of typhoid fever are due to contamination of food by typhoid bacillus carriers. The method chiefly used to detect typhoid carriers is to make direct plates from the feces or urine using the Endo plate or agar plates containing different concentrations of brilliant green. Suspicious colonies are transferred to Russell double sugar tubes and later agglutination tests are made against known typhoid antiserum. The recognition of the role of carriers has had the effect of modifying administrative methods chiefly in two directions: carriers are now sought among food (including milk) handlers whenever cases occur which seem traceable to food, and the search is often rewarded by finding a carrier; convalescents from typhoid fever are not released from observation until laboratory examination of stools and urine shows that the individual no longer discharges the typhoid organism.

The problem of the chronic carrier is a difficult one and it cannot be said that a satisfactory solution has been reached. In general, an effort is made to keep these persons out of occupations that would permit them to contaminate food; in a few cases it has been necessary to curtail the liberty of the individual by incarceration in a hospital.

Treatment of carriers has been generally unsatisfactory but removal of the gall bladder, which is often the seat of the infection, may be curative. It is considered very probable that only a small percentage of the carriers are known to sanitary authorities.

*Diphtheria.*—Investigations have shown that carriers of diphtheria

bacilli must be differentiated into those carrying virulent bacilli and those carrying the non-virulent organisms.

Carriers are also divided into healthy and convalescent, the latter probably being of much more epidemiologic importance than the former.

Although attempts at morphological differentiation of virulent from non-virulent carriers have been made, it has been found that trustworthy results are to be secured only from animal tests, although it is not considered necessary to isolate pure cultures for the animal test; the introduction of contaminated cultures of the diphtheria organism gives satisfactory results, provided the test is controlled with an animal immunized with diphtheria antitoxin.

Various chemicals have been employed in the throat and nose in the effort to clear up carriers, but none seem to be very successful; Mercurochrome is reported to have given very favorable results. The removal of tonsils and of adenoid tissue from the nasopharynx often is followed by disappearance of the organisms.

It is believed that routine examinations to detect carriers, in the absence of clinical cases, are scarcely worth the expenditure of time and effort involved.

From the point of view of danger to the contacts, the convalescent carrier, as already suggested, is regarded as more important than the chronic carrier.

Two other bacterial diseases have been much studied from the point of view of carrier's infection—*pneumonia* and *cerebro-spinal meningitis*; while interesting data on both of these have been secured, the evidence is scarcely extensive enough or sufficiently clearly indicative to afford a basis for administrative action.

The Public Health significance of the *malaria* carrier is well recognized and prophylaxis is best met by sustained treatment of the active case in the hope that the carrier's condition may be averted.

Although ordinarily not of importance in the Western hemisphere, the question of *cholera* and cholera carriers is not to be ignored. The cholera carrier may be a person who has shown no signs of the disease at any time, or one who has recovered from an attack which may have been so mild as to have given rise to only trivial symptoms. In any event the carrier's state is likely to be of short duration as compared with typhoid or diphtheria, rarely lasting beyond two weeks.

By cultural methods which employ the aerobic faculty of the cholera vibrio and its ability to grow in very alkaline media, it is possible to conduct the bacteriologic examination for carriers of a

very large number of persons' within a short time, and the procedure has been of great utility at the Maritime Quarantine Stations, and would be of great value if the disease landed on our shores. Perhaps it would be in accordance with the facts to consider the cholera carrier the most important factor in the epidemiology of the disease.

STATEMENT CONCERNING PLAGUE PREVENTIVE AND RESEARCH WORK  
CARRIED OUT IN THE UNITED STATES, IN ACCORDANCE WITH RESOLU-  
TIONS OF THE SIXTH INTERNATIONAL SANITARY CONFERENCE OF THE  
AMERICAN REPUBLICS.

With the occurrence of cases of human plague in New Orleans, Louisiana, in October, 1919, and in Galveston, Texas, Beaumont, Texas, and Pensacola, Florida, in May and June, 1920, plague-control and preventive measures were immediately placed in effect in those cities and surrounding territory by the U. S. Public Health Service in cooperation with the state and local health authorities. The plague suppressive measures for the control of both human and rodent cases of plague which were placed in effect and which continued in operation for considerable length of time, embraced the following activities:

1. Fumigation of all buildings and premises where plague infected rodents were captured or human plague cases occurred.
2. Trapping operations over the entire city, wharves, and ships, and in the surrounding country when advisable.
3. Examination of rodents for plague infection and other allied laboratory work, such as studies on the prevalence of fleas on rodents and their species.
4. Removal of all wooden floors resting directly upon the ground and of rodent harborages in and about each focus where human plague cases occurred or infected rodents were found.
5. House-to-house inspection of all buildings and premises in the city in regard to the ratproofing of the same.
6. Outgoing quarantine activities such as fumigation of ships, breasting off from piers, ratguarding of hawsers and lines, raising or proper illumination of gangways at night and similar measures for the prevention of the spread of plague to other ports.

A résumé of the plague preventive work carried out in the Gulf coast region of the United States until the plague infections had been entirely eliminated, is as follows:

*Galveston, Texas:*

The first human case of plague occurred June 20, 1920, and the final case occurred November 14, 1920. In all, a total of eighteen

human cases occurred; 114,817 rodents were examined in the laboratory for plague lesions; 76 plague infected rodents were found, the last one of which was trapped on May 12, 1922; 8,487 buildings were ratproofed at a cost of more than \$200,000 (estimated); 336,028 square yards of wood planking were removed from ground areas about the city; 150,162 square yards of concrete and 274,052 lineal feet of concrete area wall were laid. Financial cooperation was obtained from both the city and state. A local ordinance requiring ratproofing of buildings was adopted. Active work by other than the local authorities ceased January 15, 1923.

*Beaumont, Texas:*

The first human case of plague occurred June 19, 1920, and the last one occurred on August 23, 1920—a total of 14 cases occurring in the meantime. Ninety-six thousand, seven hundred and fifteen rodents were examined in the laboratory and 122 plague-infected rodents were found in the city. The last plague-infected rodent was trapped on September 11, 1920. Trapping operations were also carried out in the county surrounding the city, resulting in the trapping and examination of 42,065 rodents, one of which, trapped on October 11, 1920, proved to be plague infected; 11,677 buildings were ratproofed at a cost of about \$2,000,000 (estimated); 11,267 square yards of wood planking and flooring were removed from ground areas; about 75,000 square yards of concrete and about 80,000 lineal feet of concrete area wall were laid. Financial aid was furnished by the state, county and city. A local ordinance requiring ratproofing of all buildings was enacted by the local government. Active work in Beaumont ceased December 31, 1921, more than a year after the last plague infected rodent had been trapped.

*Port Arthur, Texas:*

One case of human plague occurred in Port Arthur. The patient worked on the docks in Galveston, where he was taken ill. He remained in Galveston five days and then went to Port Arthur where he died upon the day of arrival. Intensive trapping operations were carried out in Port Arthur from July 18, 1920, to June 15, 1921; 53,287 rodents were examined in the laboratory; one rodent, trapped upon October 25, 1920, proved to be plague infected. Extensive wrecking and fumigation operations were immediately placed in operation in the section of the city adjacent to the infected premises; 829 sheds were wrecked to destroy rodent harborages and 15,919 square yards of planking were removed. No additional plague-

infected rodents were found. The local and state health authorities cooperated in the work.

*Houston, Texas:*

A rodent survey was conducted by the U. S. Public Health Service in cooperation with the municipal health authorities in July, 1921, on account of the proximity of Houston to Galveston and Beaumont, which had suffered plague infections during the previous year. Ten thousand, three hundred and nine rodents were trapped and examined without any plague-infected rodents being found. A brief survey was also made in August, 1920, with the aid of the laboratory car "Hamilton," during which 2,876 rodents were trapped and examined without any plague-infected ones being found.

*Texas (Miscellaneous):*

During July and August, 1920, rat surveys were made by the U. S. Public Health Service with the aid of the laboratory car "Hamilton" and the cooperation of the state and local authorities of several Texas ports, in order to ascertain whether or not plague infection might be present. Surveys were made at Orange, Freeport, Corpus Christi and Aransas Pass, Texas, with negative results as to plague infection.

*New Orleans, Louisiana:*

A new outbreak of plague occurred in this city in the latter part of October, 1919, the first human case being discovered October 29, 1919. There had been no cases of plague in the city for several years, the last previous case of rodent plague having been found April 3, 1917. Plague suppressive operations had been maintained on a limited scale during the intervening years. In the new outbreak, a total of 18 human cases occurred from October, 1919, to August, 1920; 671 plague-infected rodents were found, the last of which was trapped on August 10, 1921. Owing to the large size of the city of New Orleans and its extensive commerce, the plague suppressive work was of great magnitude. From October, 1919, to June 30, 1923, when the work of the Public Health Service in New Orleans ceased, 610,301 rodents were examined for lesions suspicious of plague. When the work ceased June 30, 1923, more than 200,000 rodents had been examined without finding any plague-infected rodents since the finding of the last plague-infected rodent on August 10, 1921. Since June 30, 1923, the city of New Orleans has agreed to maintain a limited ratproofing force and a laboratory for the examination of rodents as a precautionary measure.

Additional details of the plague eradication work in New Orleans

involve the obtaining of 8,707 rodents from fumigated vessels, two rodents of which proved to be plague infected; 4,573 rodents were also obtained from buildings which had been fumigated, 111 of which proved to be plague infected; 8,975 live rodents were obtained for the purpose of making studies concerning the prevalence of fleas.

Twelve thousand, three hundred and ninety buildings were rat-proofed from October, 1919, to June 30, 1923, making a total of 173,536 buildings which have been ratproofed in the city since the 1914 outbreak of plague. The city is reported to be at least 90 per cent ratproofed at the present time. The cost of the ratproofing, including that of the new construction during the period 1919-1923, is more than \$5,620,670. More than 343,755 square yards of concrete and 367,474 lineal feet of area wall have been laid.

Important cooperation, financial and otherwise, has been obtained from the local and state authorities. Failure to properly ratproof property has resulted in prosecutions in the municipal courts under the local ratproofing ordinance. A great deal of publicity was given to the work in the city and its vital necessity in order to save the city from burdensome restrictions and to secure relatively free and unrestricted commerce. Full support and active cooperation were obtained from the local business interests and professional societies.

One of the interesting features of the laboratory work at New Orleans which has been developed and made use of at the other plague eradication stations of the Public Health Service, has been the use of composite or mass inoculations. When the usual laboratory procedures failed any longer to show plague, additional methods for detecting the disease, especially in rodents macroscopically negative, were adopted. This was done by the inoculation of a guinea pig with an emulsion of tissues from two or more rodents, sometimes from as many as several hundred, to determine the existence or non-existence of plague in any of them. This procedure has been termed combination, composite or mass inoculation, and has resulted in the finding of rodent plague cases which otherwise might have escaped notice. It has also assisted in establishing with more certainty the date of occurrence of the last positive rodent plague case.

#### *Louisiana and Mississippi (Miscellaneous):*

During the year 1920, it was deemed advisable to carry on rat surveys in various towns located along railroads with terminals in New Orleans, in order to determine if the plague infection had been transmitted inland. Surveys were accordingly made in Lake Charles, La., Baton Rouge, La., Alexandria, La., Bogalusa, La., Gulfport, Miss.,



and Pascagoula, Miss., in cooperation with the local authorities; 11,188 rats were trapped and examined at the New Orleans laboratory without the finding of any plague-infected rodents.

### *Pensacola, Florida:*

The first case of human plague occurred May 31, 1920, and the last case on August 31, 1920, a total of 10 cases occurring in the meantime; 37,996 rodents were examined in the laboratory for plague lesions; 36 of these rodents proved to be plague infected; 8,128 buildings were ratproofed; 41,294 square yards of concrete and 58,255 lineal feet of concrete area wall were laid. The cost of the ratproofing was approximately \$391,788. The work of the U. S. Public Health Service in Pensacola was discontinued on August 15, 1921, since no plague-infected rodents had been trapped for a considerable length of time previously. Valuable cooperation was obtained from both the local and state health authorities. The ratproofing of property was carried out with the aid of a local ordinance enacted for that purpose.

### *Florida (Miscellaneous):*

In cooperation with the State Health authorities, rat trapping operations and ratproofing ordinances were urged and instituted in a number of the sea coast cities during July and August, 1920. During the rat survey of Key West, 3,713 rodents were trapped, none of which proved to be plague infected.

In addition to the plague preventive work in the Gulf coast region, rodent surveys have been conducted along the Atlantic seacoast. Among the objects of the U. S. Public Health Service in the stimulation of rodent surveys and ratproofing studies along the Atlantic seaboard have been the following:

1. To determine the existence or absence of rodent plague infection.
2. To determine reasons for possible immunity if no rodent plague infection is found.
3. To determine the effectiveness of present quarantine measures in preventing the introduction of plague into the United States.
4. To establish a nucleus organization and to have properly trained personnel in event of future outbreaks.

Surveys covering various types of work have been conducted as follows:

### *Savannah, Ga.:*

A rat survey was made in this city in August, September and October, 1920, in cooperation with the local authorities; 10,351 rodents

were trapped, none of which proved to be plague infected when examined in the laboratory.

*Charleston, S. C.:*

A rat survey was carried out during the period of July to October, 1920, during which time 12,954 rodents were trapped. None of these rodents were found to be plague infected. A local appropriation of \$5,000 was used, in addition to Federal funds.

*Baltimore, Md.:*

During May and June, 1921, a survey was made in cooperation with the local health authorities concerning the degree of rodent infestation and methods for its control, particularly with respect to ratproofing. A detailed report with definite recommendations was submitted to the local authorities.

*New York City, N. Y.:*

Since 1920, studies have been made by both the local and federal health authorities as to the vulnerability of the city in relation to plague infection. Ratproofing investigations have been made of the waterfront and of areas where rat breeding and harborage are likely to exist. Newer and stricter regulations have been adopted by the local authorities relative to the docking of vessels from suspected or infected ports—especially fumigation requirements, rat-guarding of hawsers and gangplanks, fending off from the dock and going into dry dock.

A rat trapping campaign by the city health authorities has been practically in continuous operation since that time. The Public Health Service has assisted in the work through advice and consultations, and by furnishing an expert trapper to assist in the training of the local men. During the past four years, more than 50,000 rodents have been trapped by the local health department and examined in their laboratory without the finding of any plague-infected rodents.

In addition, the Quarantine Station maintained by the Public Health Service at New York, routinely collects and examines in the station's laboratory all rats collected after fumigation or trapped on vessels. During the past three years, about 32,000 rodents have been thus obtained and examined without the finding of any plague infected ones. Composite or mass inoculations of guinea pigs are made with emulsions from all rats—1 pig to 10 rats. Smears from each rat are examined microscopically with but few exceptions.

The health department of New York City has also cooperated with

the U. S. Public Health Service in what is known as "rodent-flea" surveys. These surveys consist of the trapping of live rodents and the collection of the fleas from each rodent. The fleas are preserved in vials of alcohol, properly labeled, and are later identified as to species and sex by an entomologist of the Public Health Service. The method of collecting the fleas from a rat consists of killing the rat and its immediate suspension over a large pan of water of size sufficient to prevent the escape of the fleas when they commence to leave the dead rat as it becomes cold. In 24 hours time, the fleas can be collected from the surface of the water. Combing of the rodent shows that practically no fleas are still lodged upon the rat at the expiration of that time. This work has progressed in New York City for the past two years. To date, about 3,500 live rodents have been trapped from which more than 6,500 fleas have been obtained.

The purpose of this flea survey, as well as of those conducted in other ports, has been to obtain scientific data relative to flea distribution and prevalence. Similar surveys have already been conducted in Galveston and Beaumont, Texas, New Orleans, La., and Pensacola, Fla., in connection with plague outbreaks in those cities. Data of a like nature have also been obtained at Boston, Mass. It is believed that these surveys will disclose facts with regard to the incidence and varieties of fleas found upon rats in various United States ports which might be expected to have important bearings upon the possibility of the spread of plague, in case of its introduction, and upon the protective and eradivative measures to be planned.

#### *Providence, Rhode Island:*

From September, 1922, until August, 1923, a rodent survey was conducted by the local health department. The Public Health Service cooperated in the work by assisting in obtaining the local appropriation and by detailing an expert rat trapper to assist in the training of the local men. About 5,500 rodents were trapped and shipped to the laboratory maintained at the Boston, Mass., Quarantine Station by the Public Health Service. None of the rats proved to be plague infected.

#### *New Bedford, Mass.:*

During the year 1922, the health department of this city conducted a rodent survey. More than 3,000 rodents were trapped, none of which were found to be plague infected.

#### *Boston, Mass.:*

During the years 1921, 1922 and a portion of 1923, a rat survey was

conducted in this city. The main portion of the work was carried out by the local health department, although state and federal assistance were also made use of. A total of about 18,000 rodents were trapped and examined, none of which proved to be plague infected.

The health department of the city of Boston also cooperated with the Public Health Service in the conduct of a rodent-flea survey carried out during the period of September 16, 1922, to October 13, 1923; 1,393 live rats were caught, from which about 1,500 fleas were obtained. These fleas have been identified as to species and sex. The data so obtained is to be made use of at a future date when compiled with similar data obtained in other cities.

During the year 1922, a committee known as the New England Committee on Plague Prevention and Rodent Control was organized as a result of a meeting in Boston in June, 1921, of representatives of civic and commercial groups. This committee has urged rat surveys and ratproofing to the New England communities. A set of standard ratproofing provisions suitable for inclusion in the local building codes was prepared by the committee in cooperation with the Public Health Service and submitted to the various cities for adoption.

#### *Portland, Maine.:*

A rat survey in Portland, Maine, was carried out by the city health department from November, 1921, to February 15, 1922, to determine whether rodent plague existed in that port. A total of 2,450 rodents were trapped and examined without any plague infection being detected.

#### *Seattle, Washington.:*

Plague suppressive measures were continued in this city during the years 1920 and 1921. No plague-infected rodents have been reported since March 30, 1917. The work consisted mainly of the ratproofing of buildings, water front inspections for compliance with ratguardings, etc., rat trapping operations, and the laboratory examination of rodents. During the two years 29,114 rodents were examined, none of which were found to be plague infected; 3,124 building inspections were made; 254,032 square yards of concrete were laid.

#### *California.:*

Plague suppressive measures in California during the past few years have consisted of (1) operations in the field for ground-squirrel control, (2) work consisting of sanitary inspections, ratproofing and

some rat trapping in San Francisco, and (3) work in the federal laboratory. Squirrel-free zones have been maintained between infected territory and the rat population of San Francisco, Oakland, and Berkeley. The importance of continued squirrel control measures has been emphasized to health officers, county horticultural commissioners and other groups, and cooperative relations have been maintained. The danger of plague outbreaks exists as long as infection continues among the ground-squirrels. Operations have extended over as many as ten counties. A few human plague cases have occurred from time to time, particularly among persons who have hunted or handled infected squirrels. Five of such cases have occurred since 1920. Thirty-two plague-infected squirrels have been located during the past three years. In 1920, when 45,892 squirrels were shot in ten counties and examined in the laboratory, 185 were found to be plague infected. More than 50,000 squirrels and about 35,000 rodents have been examined in the laboratory for plague lesions. None of the rodents, which were trapped largely in San Francisco, Berkeley and Oakland, or were obtained from fumigated vessels, proved to be plague infected.

During the past four years, in the squirrel control operations, more than 2,500,000 acres of land have been inspected and about an equal amount of territory has been treated with squirrel destructors such as carbon bisulphide and poisoned grain. About 3,500,000 squirrel holes have been thus treated.

In the city of San Francisco itself, inspections have been made of about 80,000 premises during the past four years as to their ratproofing and general sanitary condition. About 23,400 square yards of concrete and about 155,000 cubic feet of area wall have been laid. More than 18,000 rodents have been trapped and examined. In 1921, a local appropriation of \$5,000 was made available for trapping operations.

## REPORT OF THE DELEGATION OF THE REPUBLIC OF HAITI

### CONSIDERATIONS ON THE RESOLUTIONS OF THE SIXTH PAN AMERICAN SANITARY CONFERENCE

1. The mortality from tuberculosis in Haiti is in the proportion of 10 per cent. The causes of the propagation of the disease are poverty, unhealthy dwellings, the lack of ventilation, excessive population, and ignorance of the principles of hygiene. The high percentage of illiterates embarrasses the work of education against the disease. Haiti has no sanitarium for the treatment of tuberculosis, although it appears that suitable places could be found for this purpose from the point of view of the necessary altitude and dryness.

2. There is a lack of detailed statistics regarding bronchitis, pneumonia, tuberculosis and whooping cough. Influenza occurs more often in a mild form with a very low rate of mortality, in comparison with that of countries lying in the temperate zone. Pneumonia is often fatal. The country is very mountainous in parts, but up to the present the relation which may exist between altitude and tuberculosis has not been seriously examined.

3. The great poverty of the population makes it impossible for them to buy specific products or medicines of any kind. Syphilis continues to be an outstanding and vexatious problem in Haiti, for 60 per cent of the inhabitants are victims of this disease (statistics based on the Wassermann reaction). The National Service of Hygiene endeavors, within the measure of its resources, to provide free treatment for those suffering from the disease, but the percentage of those who have been helped by the specific treatment is comparatively small. Specific products for the treatment of syphilis are exempt from all duties or taxes as far as regards the Service of Hygiene.

4. Malaria, as compared to other diseases, prevails in Haiti in the proportion of 20 per cent. The Service of Hygiene does not possess a sufficient quantity of quinine to prosecute the work of eradicating this disease in a proper manner. For the same reason it is impossible to adopt proper measures of prophylaxis. On the whole, very little has been accomplished in this sense. It is hoped, however, that in the course of the next three years, considerable progress will be realized in the development of preventive measures against malaria.

5. The Service of Hygiene has not yet experimented with calcium hydroxide in the destruction of mosquito larvae; the only means employed have been the use of oils and insectivorous fishes.

6. The Republic of Haiti is in favor of the adoption under the form of a treaty, of an International Maritime Sanitary Code.

7. The Republic of Haiti approves Resolution 12 of the Sixth International Sanitary Conference.

8. Statistical work has been carried on during the last three years in Haiti, but there are no sanitary statistics. Owing to the difficulty of application of the laws regarding the reporting of births and deaths, the statistics in Haiti do not present the degree of exactness that is to be desired.

9. We have already spoken of syphilis and tuberculosis. Probably there are about 200 lepers in the Republic. Plans for the construction of a leprosarium are under consideration.

10. This question has never been investigated in Haiti.

11. The number of flies is not great. Possibly this is due to the destruction of the larvae by ants.

12. On this subject, we will say that inquiries are being made in Haiti calculated to enable the Service of Hygiene to provide exact statistics on intestinal parasites. At the present time we are able to say that ascarides, ankylostoma and trichocephali are exceedingly common in Haiti. The amoebic and flagellate protozoan parasites are also common.

13. We have no precise information on these points. Typhoid, paratyphoid and bacillary dysentery are rather widely disseminated. It has not been possible to discover and sterilize the propagating agents. Intestinal parasites may possibly have something to do with the frequency of these diseases.

14. A law was passed on June 16, 1923, regarding the sale of narcotic substances. Article 19 of this law treats of the production and manufacture of food stuffs. The substance of the article is as follows: "It is forbidden to sell, offer or expose for sale any food or beverage intended for consumption to which shall have been added an antiseptic, an antiferment or any preservative composition or any other chemical product except saltpetre, vinegar, wood smoke, sugar or spices. It is permitted to add to sharp sauces, sauces, fruits or juices not more than one-tenth of one per cent of benzoate of soda, provided the addition is stated on the label in proper form."

15. Regarding the 15 points of this program, we shall express our opinion as follows:

No. 1 .....	Yes.
No. 2 .....	Yes.
No. 3 .....	Yes.
No. 4 .....	Yes.
No. 5 .....	Yes.
No. 6 .....	Not included.
No. 7 .....	Yes.
No. 8 .....	Yes.

In closing I wish to express the desire of the National Service of Public Hygiene of Haiti to cooperate with the Pan American Sanitary Bureau, and to request that in future the manuals, programs, etc., be published in French as well as in the other languages.

DR. CHARLES MATHON,

*Delegate to the Seventh Pan American  
Sanitary Conference.*



## REPORT OF THE DELEGATION OF THE REPUBLIC OF URUGUAY

Messrs. Delegates: The Delegation of Uruguay, in fulfillment of the Program of this Conference, begs to submit to the consideration of the Delegates a brief abstract of the work performed. In this account will be found the different questions contained in the Program. This work has been condensed as much as possible, being reduced to a concise account of the most important points which require being emphasized for any reason.

### *National Council of Hygiene*

#### YEAR 1920

Population on December 31: 1,494,953 inhabitants. General mortality: 19,041 deaths. Rate per thousand inhabitants: 12.73.

Mortality from infecto-contagious diseases: 2,789 deaths. Rate per thousand inhabitants: 1.86. Percentage of general mortality: 14.64.

Mortality from pulmonary and laryngeal tuberculosis: 1,693 deaths. Percentage of the general mortality: 10.30. Percentage of infecto-contagious diseases: 70.38.

#### YEAR 1921

Population on December 31: 1,527,678 inhabitants. General mortality: 18,449 deaths. Rate per thousand inhabitants: 12.07.

Mortality from infecto-contagious diseases: 2,712 deaths. Rate per thousand inhabitants: 1.77. Percentage of the general mortality: 14.69.

Mortality from pulmonary and laryngeal tuberculosis: 1,846 deaths. Proportion per thousand inhabitants: 1.20. Percentage of the general mortality: 10.00. Percentage of infecto-contagious diseases: 68.06.

### VACCINATIONS AGAINST SMALLPOX PERFORMED IN THE REPUBLIC DURING THE YEARS 1918-1921

<i>Year</i>	<i>Montevideo</i>	<i>Country</i>	<i>Republic</i>
1918 .....	8,061	7,930	15,991
1919 .....	11,609	8,303	19,922
1920 .....	18,976	37,506	56,482
1921 .....	29,162	53,355	82,517
<hr/>			
Total .....	67,818	107,094	174,912

## LEPROSY, MORBIDITY AND MORTALITY, 1920-1923

<i>Departments</i>	<i>Totals</i> —	
	<i>R.</i>	<i>D.</i>
Montevideo .....	139	96
Canelones .....	50	8
San José .....	4	.....
Florida .....	8	2
Minas .....	11	1
Colonia .....	4	.....
Soriano .....	19	5
Río Negro .....	11	6
Paysandú .....	24	7
Salto .....	19	6
Artigas .....	1	.....
Rivera .....	3	.....
Tacuarembó .....	13	1
Durazno .....	7	.....
Flores .....	1	1
Cerro Largo .....	5	.....
Treinta y Tres .....	4	.....
Maldonado .....	2	.....
Rocha .....	1	.....
Country .....	187	37
Republic .....	326	135

References: R—Reported; D—Deaths.

#### ORGANIZATION OF THE SERVICE OF TYPHOID PROPHYLAXIS OF THE NATIONAL COUNCIL OF HYGIENE

First—Statistics of typhic infections.

Second—Progress of vaccination against typhoid in the capital and in the Departments.

Third—Protection of water.

Fourth—The control of flies.

Fifth—Protection of food.

Sixth—Propaganda, publicity.

#### ECONOMIC ASPECT OF TYPHOID PROPHYLAXIS

Equivalent in money of the annual loss to the Republic: \$1,000,000.  
Patients in ten years, 7,370<sup>1</sup>. Deaths, 1,946.

<sup>1</sup> This figure is below the reality.

1. NATIONAL COUNCIL OF HYGIENE<sup>1</sup>

This organization submits from time to time to the Department of Industries under which it operates, a memorandum showing the sanitary condition of the country, and the resolutions, works and measures put in practice for the defense of public health. It reports to the Department on any epidemics which may have occurred during the year, and describes the prophylactic measures employed to safeguard the public against infecto-contagious diseases. For instance, the National Council of Hygiene among the measures adopted in recent times to prevent the development of typhoid fever, which is often liable to occur, especially in the rural districts in a certain season of the year, decided to carry on prophylaxis by means of anti-typhoid vaccination. The organization is constantly on the lookout in all matters referring to the control of infecto-contagious diseases, and through the employment of all its legal and material resources, seeks to avoid all causes of insalubrity capable of acting unfavorably on the public health. The National Council of Hygiene is charged with the superintendence of the national health, and looks after all questions regarding the same. In the capital of the Republic, the office of the Inspector of Health and other technical expert organizations contribute largely to the furtherance of its activities.

## 2. INFECTO-CONTAGIOUS DISEASES

*List of Diseases Required to Be Reported*

According to the terms of Ordinance No. 6 on the compulsory notification of infecto-contagious diseases and in conformity with resolutions which from time to time have been passed by this Council, the diseases included at the present time among those which are required to be reported, are the following:

Adenitis of unknown cause	Poliomyelitis, Epidemic Acute
Anthrax, Malignant	Puerperal Fever
Beri-Beri	Purpura Haemorrhagica
Chickenpox	Scarlet Fever
Cholera	Smallpox
Diphtheria	Trachoma
Encephalitis, Lethargic	Tuberculosis, Pulmonary and
Erysipelas	Laryngeal
Grippe in grave form	Typhoid Fever
Leprosy	Typhus
Measles	Varioloid
Meningitis, Epidemic Cerebro-spinal	Whooping Cough
Paratyphoid Fevers	Yellow Fever
Plague, Bubonic	

The physicians make the notification within twenty-four hours after the presence of the disease has been verified, except in cases of cholera,

<sup>1</sup> See pamphlet, "Law Creating the National Council of Hygiene"—Bill of Dr. José F. Arias on the Reorganization of the National Council of Hygiene.

yellow fever, bubonic plague, smallpox, diphtheria, and scarlet fever, or cases suspected of being these diseases, which are reported immediately.

### 3. THE CONTROL OF TUBERCULOSIS

The work of education and investigation on cooperative measures as a factor in the campaign against tuberculosis has been carried on throughout the country for some time past. This important question has been dealt with at former Congresses and Conferences, but up to the present this system of campaign has not formed part of the local defensive machinery, with regard to the disease in question. Nevertheless, we shall take up the consideration of the effort which has been made throughout the country during the last three years.

The action of the Uruguayan Anti-Tuberculosis League, from the first of January, 1921, to the 30th of April, 1924, is as follows: During this period the League has cared for 26,344 patients. One thousand, three hundred and one persons left the hospital as cured or as having derived remarkable benefits and being capable of resuming their work, the greater part of them having been treated in the sanatorium, where there are always 100 patients under treatment, exclusive of those registered in the "Open Air School." The requests for admission to the sanatorium are so numerous that at present there are 200 persons awaiting their turn to be admitted.

The dispensaries, the importance of which has become every day more evident, have exerted their mission of assistance, preservation and health education with the greatest regularity, notwithstanding the constantly increasing number of patients, which reached 22,668 during the period in question.

The percentage of deaths among the patients who attended the dispensaries was 2.14.

Besides the social welfare work which the League carries on through its agencies, it has distributed the following aid: meat, 291,848 kilos; bread, 224,078 kilos; milk, 593,474 litres; beds, 387; mattresses, 462; pieces of clothing distributed, 17,365. Besides this, the League has donated \$6,000 for payment of housing for indigent patients, and \$25,200 for neighborhood aid, for the benefit of patients living outside the radius of the distribution of food.

The popular baths of the League were operated regularly during this time, and were attended by 84,171 bathers, demonstrating the need of this service which, as a measure of hygienic education, fulfills one of the aims of the institution.

The inspectors have effected 9,609 visits to patients to whom they have given advice on prophylaxis and suggested the indispensable improvements in their dwellings.

In the sanatorium, which has rendered such invaluable services in the campaign against tuberculosis, there is a constant renewal of inscriptions, the duration of which varies from three to five months, as in this manner the benefits are made available to a greater number of patients.

The abundant and nutritious food with which they are provided, the régime of rest, and the life which they lead, breathing pure air saturated with balsamic substances from the eucalypti, pines and other forest trees which abound in the park, contribute to secure the excellent results obtained, which are demonstrated by the increased weight, the general improvement, and the percentage of cures, which amounted to 52.42 per cent during the period in question.

The League performs, from time to time, the disinfection of the clothes and utensils belonging to the patients, through the Section of Disinfection. During the period of which we are speaking, disinfection was performed on 46,923 kilos of clothing belonging to 2,227 patients; while 772 vehicle journeys were performed in the transportation of this clothing.

The Section of Laryngology gave 634 consultations in 156 days of attendance of patients sent by the dispensaries.

The League proceeds in the following manner with regard to the admission of patients: The candidate presents himself at the office stating his poverty and disease, and is immediately directed to one of the three dispensaries which are distributed strategically throughout the city zone. He is then carefully examined by the medical director, and should the nature of his disease give no room to doubt, he is admitted at once, after which a visit is made to his home in order to investigate the hygienic conditions in which he lives, and detailed information is gathered regarding defects to be corrected and needs to be filled. Those patients who are found in conditions of being admitted to the sanatorium receive a patient's card, and those whose condition requires that they be isolated are persuaded by all possible means to take such treatment, either in the H. Fereyra Hospital or in appropriate rooms rented for their isolation.

#### 4. INVESTIGATION ON LEPROSY<sup>1</sup>

##### *Statistics and Distribution—Etiology and Prophylaxis . . .*

The most important study of this disease has been carried on in this country since the Sixth Conference by Dr. Jose Brito Foresti. We shall now proceed to state those points in connection with the national health which are most deserving of attention.

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<sup>1</sup> This work is published in full in the Bulletin of the National Council of Hygiene.

In writing this chapter we shall avail ourselves of the data which we have collected on the subject for the preparation of three works submitted to three Congresses, one in Montevideo in 1901, another in Buenos Aires in 1904, and the third in Río de Janeiro in 1918, and of the data which we have been able to collect from the last date until the present. There is a total number of 215 cases distributed throughout the Republic according to the statistics of the three Congresses to which I have just referred. From this number we have deducted the deaths and have obtained a total of 180 cases of leprosy existing in Uruguay in 1918. As in the former statistics, we have added to these cases the new cases which we have seen personally from September, 1918, to September, 1922, and those cases reported to the National Council of Hygiene during this same period, this data having been kindly supplied by the said corporation.

Personally, we have observed 23 new cases, two of which were residents in the State of Río Grande del Sur, and the National Council of Hygiene has received seventeen reports of new cases. If we deduct from these figures twenty-one cases of death from this disease, we have a total of 197 cases known in September, 1922.

*Statistics of Cases of Leprosy Observed in Uruguay from 1898 to 1922*

<i>Department</i>	<i>Congress of Río de Janeiro, 1918</i>	<i>From 1918 to 1922</i>	<i>Total</i>
Canelones .....	33	1	34
Soriano .....	11	1	12
Montevideo .....	74	14	88
Cerro Largo .....	4	...	4
San José .....	4	...	4
Rivera .....	4	...	4
Colonia .....	3	...	3
Paysandú .....	9	2	11
Río Negro .....	5	...	5
Maldonado .....	1	...	1
Durazno .....	7	2	9
Florida .....	5	1	6
Tacuarembó .....	4	1	5
Minas .....	5	...	5
Treinta y Tres .....	1	...	1
Rocha .....	1	...	1
Artigas .....	1	...	1
Salto .....	8	...	8
	180	21	201

These 201 cases constitute the data of the whole country until September, 1918, and my 21 personal new cases, to which we must add those reported to the National Council of Hygiene.

Total prior to September, 1918.....	201
Reported to the National Council of Hygiene.....	17
	<hr/>
	218
Deaths .....	21
	<hr/>
Present total .....	197

### *Conclusions*

As regards Uruguay, therefore, we have to present the following:

Regarding statistics and clinical forms:

I. Uruguay has at present 197 known cases of leprosy. These are disseminated throughout the country in small foci and isolated cases. The disease shows no tendency to either increase or diminish.

II. The clinical forms correspond to the common types of the disease. The intensity of the disease is not great; its duration is in general very long. The great mutilating forms, and the more unusual forms are not observed in Uruguay. There are many cases of a benign form.

As to Prophylaxis:

III. The immigration of lepers should, on principle, be prohibited.

IV. The isolation of lepers is the best means known at present of preventing the development of the disease. Its isolation need not be strictly obligatory. The sanitary authority or the attending physician may decide in accordance with the form of the disease and other particular circumstances in each case whether or not the isolation may be effected in the patient's home. In other cases, both the health authority and the physician will have the right to require obligatory isolation.

V. The establishment of leprosaria, leper colonies, polyclinics and other similar establishments is advisable as a corollary to the former proposition, and as the best way of studying and instituting treatment.

VI. Patients of all classes should be instructed as to the most efficacious prophylatic means of avoiding the dissemination of the disease.

VII. The marriage of a leper with a person not a leper will be prohibited. Marriage between lepers will be tolerated. In both cases

the separation of the children from their parents is an invariable rule. Nursing by a leper mother is prohibited.

VIII. It is desirable that lepers be excluded from certain trades, such as the food and clothing industries, and those which compel them to be in contact with the healthy population.

IX. Places accidentally occupied by moving lepers will be disinfected as soon as possible.

X. All these measures will be taken with due consideration for individual freedom and the mildness of customs which characterize present Society.

### 5. ANTI-VENEREAL CAMPAIGN

The Governing Committee of the Institute of Syphilis Prophylaxis, in pursuance of the provision contained in Part 6, Number 5 of the Convention by which it is governed, submitted the report corresponding to the year 1922.

In this report are found partial reports submitted by the Dispensaries of Montevideo and the rest of the country, and by the Central Laboratory, in which are recorded the data referring to the movement of patients, the treatment employed, and also observations which the functioning of these institutions has suggested to the physicians in charge.

The reading of these documents demonstrates that the action of the Institute is moving on normal lines, and that it is progressing gradually in the development of its task, with evident benefit to the community and more especially to those in need of its services.

#### *Dispensaries*

Dispensaries have been opened at the following places: Trinidad (Flores), Rocha, Carmen (Durazno), Sarandí del Yi, Salto, Artigas, Paysandú, Florida, La Paloma (Tacuarembó), Santa Rosa (Artigas), Guichon (Paysandú), Melo, Sarandí Grande, Santa Isabel (Tacuarembó).

For the establishment of the dispensaries of Trinidad and Rocha the Institute has been favored with very generous cooperation, popular subscriptions having been taken up in both cities with excellent results.

In the City of Trinidad the Uruguayan Anti-Tuberculosis League has contributed in a very efficacious manner, granting a room in the building occupied by them for the establishment of the dispensary. In the City of Rocha the Institute has secured the aid of the Departmental Council of Administration which has provided the



locality for the establishment of the dispensary and defrays the payment of its rent.

Also in Sarandí del Yi, the Auxiliary Council has undertaken to pay the rent of the room occupied by the dispensary, and the same is being done in the towns of Carmen and Santa Isabel.

### *Institute of the Prophylaxis of Syphilis*

It is well known that our country is one of those which have paid the greatest attention to the prophylaxis of syphilis through the initiative of the National Council of Hygiene, supported by the Government of the Republic.

The institute in charge of this work has established in Montevideo six dispensaries, which are in constant operation and to which all persons may apply who wish to know whether or not they have syphilis or who wish to be treated for this disease. These dispensaries are operated gratis, and have rendered great service to those who have applied to them.

During this same year these dispensaries have cared for about 2,000 patients in whom injections have been made, free of charge, amounting to 7,000 grams of novarsenobenzol.

### *Law of October 27, 1919*

With a view to extending the action of the Prophylactic Institute, the legislative body sanctioned a law drafted by Senator Dr. Alejandro Gallinal, which provides for the establishment of a tax of one centésimo per hectare on all land devoted to the cattle industry. This tax amounts to \$140,000 a year, and with this sum dispensaries will be established in all the cities and towns of the Republic, and the prophylactic action now being effected in the dispensaries established in Montevideo will be extended.

### *List of Specifics Which Are Held to Be Efficacious for the Control of Syphilis*

Neosalvarsan, Salvarsan, Novarsenobenzol, Arsenobenzol, Galil, Hectine, Hectargyre, Ludyl, Enesol, Injectable Gray Oil, Injectable Calomel, Di-iodide of Mercury, Cyanide of Mercury, Proto-iodide of Mercury, Salycilate of Mercury, Coloidal Mercury, Neo-Arsaminol Takamine, Iodogyre (ampules or tablets), Novasurol, Trepol, Curaluez, Sufarsenol, Muthanol.

*Conference on the Prophylaxis of Venereal and Syphilitic Diseases and the Reorganization of the Sanitary Service of Prostitution*

Bill submitted by the President of the National Council of Hygiene, Dr. Alfredo Vidal y Fuentes, regarding the holding in Montevideo of a Conference with the object indicated.

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The fact that the present regulations for the sanitary inspection of prostitution have been in force for so many years, has convinced me that it would be advisable for these regulations to be revised for the purpose of modifying some of their provisions which have been found deficient in practical utility, or adding other new ones capable of imparting greater efficacy to the activities of the prophylaxis of syphilitic diseases, in charge of the National Council of Hygiene.

The frequent conversations which I have held on this subject with officials in charge of the service of inspection of prostitution have strengthened my conviction, and for this reason I would propose the holding in Montevideo of a Conference for the purpose of dealing with this subject, such Conference to be composed of all the officials attached to that service and those under the National Council of Hygiene.

It has been often said that the living conditions of certain prostitutes render the visit of inspection difficult, owing to lack of light, comfort, etc.

At other times the case would occur of the police denouncing a woman for plying clandestine prostitution, and when the latter presented herself for inscription, the examining physician would verify the presence of tuberculosis, for which reason he would not be able to inscribe her in the register because this is prohibited by the regulations on prostitution. What is to be done with this woman, who will go on plying her trade clandestinely in order to live?

Problems like these and others equally important will have to be settled by the Conference, and in view of the special equipment of its members, it is to be foreseen that they will be settled well.

In accordance with these considerations, I submit the following resolution:

*The National Council of Hygiene Resolves:*

(a) To convoke in the City of Montevideo a conference to be composed of the medical officers belonging to the Sanitary Service of Prostitution, both of the Capital and of the country (physicians of the Public Service).

(b) The object of this Conference is to contribute to the reor-

ganization of that Service, proposing reforms and improvements to the dispositions in force at present or making any suggestions concerning their fulfillment. Besides this, it would be called upon to propose more appropriate measures for the prophylaxis of venery-syphilitic diseases in Uruguay.

(c) The National Council of Hygiene will indicate the topics recommended for treatment at this Conference.

## 6. THE CONTROL OF MALIGNANT ANTHRAX

Since cattle-raising is our principal industry, it is no wonder that our country should pay toll to this infection. A campaign against this disease has been carried on since the year 1916. The Veterinary Sanitary Police is carrying on the fight against animal anthrax and the National Council of Hygiene putting into play all its resources for the protection of the community against human anthrax. The Department of Industries, which embraces both sanitary institutions, has worked industriously, waging rational and scientific war against the disease of Davaine.

The Department has lost no opportunity to effect a broad study of vaccination against anthrax in cattle, a method of prophylaxis which is being generalized and becoming better known throughout the cattle-raising class. We can affirm that, owing to the studies carried out by a special committee appointed for this purpose by the National Council of Administration, the anthrax problem is better known, and is in a fair way to be placed under control with regard to the interests of public health and of the cattle-raising industry.

## 7. THE PROPHYLAXIS OF TRACHOMA

This disease is somewhat widely disseminated, but the number of persons treated, according to statistical data, is indeed very small. We must observe, however, that there is a good deal of preoccupation on the part of the sanitary authorities regarding imported cases of trachoma. On more than one occasion the National Council of Hygiene has been compelled to refuse admission to passengers bringing this disease from their ports of origin.

The inconvenience which these sanitary measures impose on passengers is extremely serious, not only from a hygienic point of view but from an economical one.

It will be useful to embody this program in the next Conference, in order to seek the best solution on the basis of known scientific principles.

8. POISONOUS SNAKES<sup>1</sup>

The National Council of Hygiene has undertaken to discover what poisonous snakes exist in our country, and, in pursuance of this object, has addressed a communication to persons who are informed on the subject, requesting their opinion. It has also requested of all physicians of the Public Service in the field any data which they may possess concerning the existence of these snakes, their classification, the frequency of accidents caused by them in man, and the cases of death resulting from the bite of poisonous snakes.

On this important question, after a lengthy study, the respective order submitted by the President of the Corporation was sanctioned.

## 9. THE SUPPLY OF DRINKING WATER

The Board of Health, a branch of the Department of Public Works, and directed by Señor L. Magnocavallo, is now projecting, directing and constructing the works for the supply of drinking water and for sewerage in all the cities, towns and villages of the Republic, with the exception of the Department of Montevideo.

In fulfillment of these tasks, the said office has sent us the following data in accordance with the Law of December 27, 1915, and has contracted with the Ulen Contracting Company, of Chicago, for the construction of the sanitary works of the cities of Salto, Paysandú and Mercedes, the chief characteristics of which are detailed below.

For the water supply of the first two of these cities, which are situated on the shores of the Río Negro, the waters of this river have been utilized.

The water, after a preliminary coagulation and decantation in proper tanks, is filtered on to sand beds at a high velocity (rapid filtration system). The coagulating agent used from the beginning of the exploitation of these services is aluminum sulphate.

*Statistical Data*

The volume of water consumed during these last two years has reached the following figures:

	<i>Cubic Meters</i>	
	<i>1922</i>	<i>1923</i>
Salto.....	912,145	865,409
Paysandú.....	751,872	737,762
Mercedes.....	507,145	497,329

<sup>1</sup> Bulletin of the National Council of Hygiene, Volume 14, Year 15, Number 170, December, 1920.

It will be observed that the volume of water consumed in the year 1923 is less than that consumed in the preceding year, which is explained if we bear in mind that during the year 1923 there was an increase in the number of water-meters in use.

The coagulating agent employed per cubic meter of water treated has been during these two years on the following average:

	<i>Grams</i>	
	<i>1922</i>	<i>1923</i>
Salto.....	39.7	40.0
Paysandú.....	39.2	30.4
Mercedes.....	69.7	60.9

The water for the washing of the filters reached during the same period the following average percentages, which refer to the total of the filtered water:

	<i>Per Cent</i>	
	<i>1922</i>	<i>1923</i>
Salto.....	1.54	1.81
Paysandú.....	0.89	1.21
Mercedes.....	1.62	1.50

The number of washings reached:

	<i>1922</i>	<i>1923</i>
Salto.....	212	162
Paysandú.....	101	116
Mercedes.....	124	81

The number of water connections corresponding to the other services in January, 1924, was as follows:

Salto.....	1,645
Paysandú.....	1,406
Mercedes.....	1,161
Total .....	4,212

### *Sewers*

All the three cities mentioned have adopted the single system of drainage. The sewage matter is thrown into the Uruguay and Negro rivers, without previous treatment. The volume of these streams and the provisions adopted to catch the water and effect the discharges have made it possible to solve in this manner the problems of sewerage and of the supply of drinking water.

The number of sewage outlets on January 1, 1924 was:

Salto .....	841
Paysandú .....	709
Mercedes .....	657

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Total ..... 2,207

According to the provisions of the Law of February 26, 1919, which provides for the systematic execution of these utilities in the fifteen remaining department capitals, a contract was awarded to the "Compañía General de Obras Públicas" of Buenos Aires through a call for tenders held on December 24, 1923, for the execution of the works of water supply and sewerage in the cities of San José, Rocha, and Treinta y Tres. The work will begin shortly, and is expected to be finished in the early part of 1927.

Besides the above, there is a resolution pending on the awarding of contracts for the works of the cities of Durazno, Florida, and Rivera, for which a call for tenders was issued some time ago.

Prior to the execution of the above mentioned works, the Board of Health had planned and executed small works for the distribution of water at the sources and the methods of purification specified as follows:

Batle y Ordóñez.—Spring water. Distribution without treatment.

Artigas.—Water from the Cuareim river. Purified by the system of double filtration.

Juan L. Lacaze.—Water from the River Plate. Purified by the system of double filtration.

Tala.—Subterraneous water (deep borings). Without treatment.

Sauce.—Subterraneous water (deep borings). Without treatment.

On October 31, 1921, a law was passed appropriating the sum of 300,000 pesos for the execution of works for the distribution of water to the small settlements of the Republic, and in compliance with this law, plans have been made for the work in the villages of Santa Lucía, San Ramón, and San Carlos, and tenders have been called for their execution. The sources of the water supply are the Santa Lucía river for the first two, and the San Carlos stream for the last, the system adopted for the purification being that of double filtration.

Other works have been performed and borings have been carried on, with the object of solving in an economical manner the problem of water supply for other towns and villages of the Republic, where it would not be possible to utilize other sources without heavy expense.

## 10. THE ANTI-TYPHIC CAMPAIGN

The Anti-typhoid Vaccination Service which is conducted at the headquarters of the National Council of Hygiene, involves an effort on the part of the health authorities to carry on the anti-typhic campaign with the employment of modern methods, consisting chiefly of vaccination. The President of the Council, Dr. Alfredo Vidal y Fuentes, had frequently urged the Institute of Hygiene to undertake the preparation of an anti-typhoid vaccine. In response to this appeal the Institute prepared an immunizing agent against eberthaemia, and began at once to try it in several localities in the interior of the country, where several centers of typhoid fever had made their appearance.

The vaccination met with favor, and the National Council of Hygiene charged Drs. González and Viana with the task of submitting a bill for the reorganization of the plan of defense against typhoid fever throughout the country. The members of the sanitary corporation reported in due time, and explained their plan of attack against eberthaemia, with the utilization of all available prophylactic resources, and particularly vaccination, and described the excellent results obtained in those countries which had employed this method of modern prophylaxis. The bill was published in full in the bulletin of the corporation, and was approved by the Council on April 29, 1919. At a later date the author of the present sketch felt that it was now time to proceed on a larger scale with the prophylaxis of eberthaemia, and submitted to the Council, on the 10th of May, 1921, a bill for the extermination of typhoid fever in Uruguay on the basis of the establishment of a Service of Prophylaxis.

This bill was approved by the National Council of Hygiene, and referred to the National Council of Administration, to request the indispensable funds to carry on the work. Today, with these resources in hand, the Anti-typhoid Vaccination Service has been properly installed and a special division has been built for that purpose at the headquarters of the Council. It may be said that this office is comparable to those which we have visited in some of the cities of the United States of America. The vaccine is provided by the Institute of Hygiene. The author of this work has directed up till now, at the request of the sanitary authorities, the above-mentioned Anti-typhic Service, which for the present is limited to the practice of vaccination, but which will shortly give shape to the anti-typhic campaign, incorporating new defensive factors, inseparable at the present time, in order to arrive at the gradual extermination of typhoid fever throughout the country.

### *Health Education*

It is certain that the practice of anti-typhoid vaccination among the civil population will continue to spread with a better knowledge of the beneficial results which it has insured in avoiding the contagion of the disease which has exacted so heavy a toll in our country.

The proper authorities have employed every effort to disseminate the use of anti-typhoid vaccination. Many physicians have cooperated to the same end; the press has been a powerful factor of education and scientific publicity. Let us endeavor to develop health education among the people; the sanitary condition of a country, as has been said by the eminent professor, George C. Whipple, is to be determined by the mentality of its inhabitants. When we introduce into the teaching of children and young people definite ideas concerning the manner in which transmissible diseases are acquired, and the manner in which they are to be avoided, we shall have made a great advance in the sense of the formation of a health conscience. The men of the future will then have learned how to defend themselves against the danger of the invasion of such diseases, and the leading authorities will find their best allies in the mass of the population, who will facilitate the social mission which they are called upon to fulfill and render fruitful the work to be performed for the good of the country.

#### *Extraordinary Service of Anti-typhoid Vaccination*<sup>1</sup>

During the present year the National Council of Hygiene has organized an Extraordinary Service of Anti-typhoid Vaccination.

This Service, which began to function on January 7, last, was instituted primarily for the purpose of immunizing persons engaged in agricultural pursuits in stated localities, through the generous cooperation of the National Public Welfare Service, which appropriated to this end the sum of 5,000 pesos.

Up to the present, the Council has shipped to the departments of the interior of the Republic about eleven thousand doses of anti-typhoid lipovaccine, free of charge and properly packed. The reasons for the preference given to the lipovaccine prepared by the Institute of Experimental Hygiene are well known.

There are now over seventy physicians lending their unselfish and valuable cooperation toward the success of this prophylactic campaign, who have been provided with the necessary quantities of vaccine.

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<sup>1</sup> Bulletin of the National Council of Hygiene, Vol. XVII, No. 188, June, 1922.



In addition to the use of posters as publicity media, the Council sent out, with each lot of vaccine, a number of folders regarding its use. Some of these folders contained instructions as to the method of applying the prophylaxis, while others are intended for the recording of any remarks concerning any reactions arising from its application, and still others are for use in recording reports as to its efficacy.

According to the communications which have been received, it may be said that the results obtained up to the present are very encouraging.

The office charged with receiving and studying the different observations will in due time submit a report containing precise data on the general results obtained by the above-mentioned physicians and will forward it to the Council.

Anti-typhoid Vaccination Service. Vaccinations performed:

Year 1920 .....	4
“ 1921 .....	127
“ 1922 .....	304
“ 1923 .....	197

### *Program for the Extermination of Typhoid Fever*

#### *Creation of the Service of Anti-typhoid Prophylaxis*

Below will be found the summary of the program for the extermination of typhoid fever and the establishment of the service of anti-typhoid prophylaxis.

1. Brief consideration. 2. The control of typhoid in foreign countries. 3. Anti-typhoid vaccination in the Army and in some infected localities. 4. Anti-typhoid Vaccination Service of the National Council of Hygiene. 5. Prophylactic action in the interior of the country. 6. The supply of drinking water. 7. Cooperation of the State in the control of typhoid. 8. Sanitary cooperation of the physicians of the country. 9. Scientific aspect of prophylaxis. 10. Creation of the Service of Anti-typhoid Prophylaxis. 11. The extermination of typhoid fever. Economic relations.

The above-mentioned program describes the facts connected with the eberthemic endemic in the Republic and a series of indispensable considerations, after which the prophylaxis of typhoid fever is resolutely approached, with the statement that, pending the construction of works of sanitation and water supply, which are necessary for the extermination of typhoid fever throughout the country, the prophylactic campaign must be based chiefly on vaccination, without excluding, however, the elimination of other causes of typhoid which

maintain the endemic condition in our country and from time to time bring about the appearance of epidemics.

Of course, impure drinking water is blamed. Also certain kinds of food of vegetable or animal origin will transmit the infection, and domestic utensils which have not been disinfected, flies and so forth are agents of contamination of the human organism. Consequently, the anti-typhoid problem presents a certain degree of complexity, and cannot be solved exclusively by vaccination.

It is thus seen that without precluding a gradual solution of all the problems embodied in the prophylaxis of eberthaemia, vaccination holds the first place in the attention of the sanitary authorities of the country.

### 11. THE CONTROL OF FLIES

The National Council of Hygiene, at its session of January 18, 1919, approved and referred to the Executive a bill submitted by one of its members, Dr. Justo F. González, on the control of the fly, the conclusions of which are as follows:

1. The campaign against flies should be conducted scientifically, and should be carried on during the different biological phases of the insect, that is, in its state of egg, larva, and adult.

2. A special committee shall be appointed to plan the organization of the campaign, such plan to be submitted in due time to the approval of the Council, together with whatever measures they may deem most desirable for the success of the undertaking.

3. This committee will conduct the work of educating the people through every means in its power.

4. The committee will be under the superintendence of the National Council of Hygiene, to which it will report annually on the result of the work.

5. The special committee will be of an honorary character, and will be composed of the following officers:

Two members of the National Council of Hygiene, the Director of the Institute of Experimental Hygiene, the Director of Health, the Director of the School of Experimental Medicine, the Professor of Parasitology of the Faculty of Medicine, one member of the Staff of School Physicians, the Chief of Military Sanitation, and three Delegates appointed by the executive.

The chairman of this committee will be one of the members of the Council.

*The Campaign Against the Fly in the Schools—Plan of Organization*

Dr. Rodríguez, a member of the committee, suggested that a communication be addressed to the National Council of Primary and Normal Instruction, requesting that sanitary education for the prophylaxis of the fly be declared obligatory in all the schools of the country, both public and private.

When this authorization has been secured, the campaign in the schools will be conducted along the three following lines:

In normal schools;

In primary schools;

In adult schools.

In the normal schools, the plan to be developed should be vast and complete, for we must not forget that on the education and preparation of the normal pupils, who are to be our future teachers, depend the teaching and enlightenment of the other two groups, the primary schools and the schools for adults.

This instruction will be in charge of the Professor of Hygiene, who may conduct it either through lectures or through periodic lessons.

During the whole course of the year 1922, an efficacious and permanent action has developed, with positive results for the destruction of the fly. Through the daily press, periodical journals, special reviews, posters, and folders, the public has imbibed the conviction that the fly constitutes a real danger to the public health, and thus all social classes and numerous public and private institutions have been led to interest themselves in the campaign against the fly. A moving-picture film was secured entitled "The Fly and Its Dangers," which shows the entire process of the insect, its different states, its places of reproduction and life, and the manner in which it transmits some infectious diseases, which are entirely avoidable, such as typhoid, cholera, tuberculosis, la grippe and dysentery. This film has been utilized as an educational factor, with results which may be considered excellent.

Thousands of circulars have been sent out requesting the cooperation of all public and private institutions, commercial and industrial houses, to aid in the campaign against the fly, and very good results have been obtained. The committee has everywhere met with a most favorable reception, and has put in play every educational resource in its power, drafting slogans concerning the fly, educational phrases which have been utilized in invoices, circulars, accounts and printed matter of various kinds, by important commercial and industrial houses in this city.

In addition to the above, an intensive work is being carried on through circulars and by stimulating in various ways all food purveyors to adopt the practice of protecting food from the contact of the flies and to utilize every method of destruction advised for the purpose of diminishing the danger.

During the year 1923 the campaign against the fly was continued with the same degree of intensity.

## 12. INTESTINAL PARASITES

From investigations conducted throughout the country regarding intestinal parasites, it may be stated that on the examination of the feces of patients suffering with diseases of the digestive organs, dysenteric amoebas and lamblias, etc., are found with some frequency in this country.

The subject of amoebiasis has been dealt with by the distinguished professors, Drs. Ricaldoni and Berta.

On the subject of lambliosis, Drs. Payssé and González have submitted an interesting communication referring to the prevalence, the parasitic form and the treatment of the disease.

Below will be found the conclusions of Dr. Gaminara on the prevalence of the *Triatoma Rubrovaria*, infected by the *Schizotripanum Cruzi*, and of Drs. Gaminara and Rinaldi, on the existence of anguilluliasis.

### Conclusions

1. Neither the continental situation of our country nor its temperate climate exempt it from certain tropical diseases, for the modern concept of the role of animals in the determination of a disease goes to show that these are frequently dependent on the fauna of each country.

2. The *Schizotripanum Cruzi* and Chagas' disease have been found in several South American countries, both experimentally and confirming human cases. The vast geographic distribution of their intermediary hosts (genus *Triatoma* Lap, 1832, and *Rhodnius* Stal, 1859) accounts for the dissemination of the disease.

3. Uruguay is the home of at least two species of triatomas (*T. Infestans* Klug, 1834, and *Rubrovaria* Blanch, 1843), distributed unevenly throughout the north, west and center of the country. These triatomas are hematophagous reduviidae which feed indiscriminately on animals or on man. They live habitually in the human rural home, and feed at night on the blood of sleeping persons.

4. The Uruguayan triatomas are infected with intestinal flagellata,

the study of which shows that they belong to the *crithidia* and *L. infestans*, described by Chagas in the cycle of the evolution of *Schizotripanum Cruzi*.

5. With the flagella of the Uruguayan triatoma, we can obtain experimentally in laboratory animals the development of a pathogenic trypanosome with all the characteristics of the *Schizotripanum Cruzi*.

6. Infected animals show, in the heart and striated peripheric muscles, the Leishamaniform parasitic nests discovered by Gaspar Vianna in Chagas' disease.

7. The study of the characteristics exhibited by the trypanosome found in Uruguay, justifies its identification with the *Schizotripanum Cruzi*, Chagas, 1909.

8. The experimental disease is very irregular in its progress and form; a greater part of the cases are mild and transient, but sometimes it causes the death of the animal. The period of incubation of the disease is from eighteen to twenty days.

9. The trypanosome has not yet been found in man in this country, because the blood of suspicious acute cases has not been examined; but the disease has been observed clinically in the three most important chronic forms described by Chagas: The pluriglandular form, the cardiac form, and the nervous form.

### Conclusions

1. In Uruguay there are autochthonous cases of anguilluliasis, verified parasitologically by the culture of larvae expelled by the patients.

2. Up to the present they have been met with only in one small locality in the department of Colonia.

3. Possibly the endemic is very discrete, as it has only been found in 4.3 per cent of the inhabitants examined.

4. Persons infested with the parasites are in the habit of going bare-footed.

5. The disease improves rapidly with the use of male fern as an anthelmintic.

### 13. SANITARY POLICE OF FOOD-STUFFS<sup>1</sup>

*Decree of the National Council of Administration, Regulating the Requirements of Food Substances Prepared, Sold or Introduced Into the Country.*

Whereas, it is necessary to adopt measures for the regulation of conditions required for such food-stuffs as are prepared, sold or introduced into the country; and

<sup>1</sup> Bulletin of the National Council of Hygiene, Vol. XVI, October, 1922.

Whereas, there is a resolution of the Departmental Council of Administration and of the National Council of Hygiene on the provisions proposed in this regard by the special committee constituted to consider the draft submitted on this subject by the Chief of the Division of Analysis of the General Board of Custom Houses, Don Victor Cappetti, as a result of the mission which he performed before the Congress on the Repression of Frauds in Food-stuffs, celebrated in Paris in 1909, which he attended as a delegate of Uruguay.

The National Council of Administration hereby

#### DECREES :

Article 1. The following rules and regulations are hereby approved, together with the technical instructions which serve as a complement to them :

#### *Regulative Provisions on the Preparation, Sale and Importation of Food-stuffs*

1. In the interest of the public health, the manufacture, sale, storage and importation into the country of substances intended for food not in accord with the technical instructions issued regarding this subject, are hereby declared unlawful.

2. All food-stuffs must correspond, as regards conditions, with the conditions laid down in each case to define the pure product, it being understood that tolerances and manipulations permitted in food-stuffs, provided they do not give rise to any change in their classification of a pure food and provided it is not necessary to state the fact to the consumer, are considered "regular operations."

3. "Optional operations" are understood to be such modifications and additions as are permitted in foods, but which are required to be stated to the buyer in such a manner as to leave no doubt as to the nature of the product.

4. With the exception of the tolerances established in order to maintain all possible concordance between the interests of the consumer and the requirements of industry and commerce, no other tolerance will be allowed, and all those appearing without being expressly authorized are held to be fraudulent.

5. Any change effected in the normal composition of food-stuffs without due warning to the buyer regarding it, expressed in a clear and positive form, as well as any deception regarding the origin of a given product, will be considered fraudulent.

6. In like manner all imitated products which are tolerated in spe-

cial cases will be considered frauds unless the fact appears clearly explained in labels, folders and advertisements.

7. The manufacture, sale, storage, and exhibition of food-stuffs not in accord with the requirements of the present regulations will be punished in the manner determined by the laws and provisions in force, and such imported goods will be refused clearance, and will be required to be reshipped to a foreign port, within a period of sixty days, or else destroyed in incinerating furnaces. In the case of food-stuffs which have become decomposed and harmful to health, they will be destroyed in the manner laid down.

8. For the effect of the fulfillment of these regulations, the Office of Custom House Analysis will be charged with the inspection of imported food-stuffs, and the Municipal Offices of Analysis shall undertake the inspection of the others.

9. All food-stuffs and beverages existing in commerce, or in the deposits of the custom houses, and not in accord with the requirements of the present regulations, may be exposed for sale or their importation may be permitted, within a period of one year, provided they contain no substances which are harmful to health.

10. Any modifications and differences of interpretation arising in the application of the present regulations will be proposed by a committee composed of one delegate of the National Council of Hygiene and the chiefs of the respective technical offices, and will have legal force as soon as they are accepted by the higher authorities.

#### 14. THE ANTI-NARCOTIC CAMPAIGN

The President of the National Council of Hygiene, Dr. Alfredo Vidal y Fuentes, in his interesting note submitted to the Ministry of Industries recommending the Anti-narcotic Campaign, expressed himself as follows:

The method indicated, that is to say, the reform of the penal law with regard to delinquencies perpetrated by dealers in stupefying drugs is not the only resource that the State would have to combat the vice of the alkaloids.

The public and private school, the lyceums, the faculties of secondary instruction, the normal schools and schools of application, the Chair of Hygiene, the Society of Medicine, the lecturing professor, the Anti-alcoholic League, which is engaged in fighting an evil similar to the one of which we are writing. All these institutions, all these learned officials would no doubt willingly lend the valuable cooperation of their knowledge and of their love for the agrandizement of our race, contributing with their precepts to prevent the develop-

ment of drug addiction, which is everywhere admitted to be a powerful cause of degeneration.

Even in this case, the educational work carried on by the directors of the different religions having followers in our country, as well as the action of several institutions of a humanitarian character, like the Salvation Army and other similar ones, might contribute efficaciously to the end in view.

Through lessons and lectures, the text of which should be printed in folders to be distributed free of charge and in great abundance, the knowledge of all the enormous dangers of the alkaloids would be carried to every one throughout the country.

The press, the whole press of the Republic, whose educational action exerts so powerful an influence on its readers, should also be requested to take part in the crusade against this evil.

In conclusion, the Council recommends:

1. That through the agency of the proper authority, steps be taken to secure the sanction of a penal law for the effective punishment of clandestine dealers in stupefying drugs; and
2. That the institutions and officers above mentioned be requested to contribute in a constant and decisive manner to prevent the propagation of the evil of the use of alkaloids.

## 15. MARITIME SANITATION

The Maritime Sanitary Administration in Uruguay pertains to the National Council of Hygiene, according to the terms of the law of its establishment, promulgated in the year 1895.

This body is the superior authority on public hygiene of the country, and although it is not charged with the administration of the municipal sanitary services and public welfare, in extraordinary cases of exotic epidemics, the Executive Power is authorized to place under the Council all establishments and services pertaining to the said corporations.

In economic and administrative matters it is the duty of the Council to issue bills of health and collect all sanitary taxes, rendering monthly accounts and reporting to the General Accountancy of the State; to form the sanitary treasury; to propose in triple lists to the Executive Power persons to be appointed to such vacancies as may occur in the medical activities pertaining to it.

In sanitary matters it is its duty to issue such regulations, orders and provisions as it may consider necessary to prevent the invasion and propagation of any infecto-contagious disease, and to render these measures effective through its staff, throughout all the territory of



the Republic, for which purpose the personnel of land and floating establishments, lazarettos, and all scientific material and accessories intended for this purpose, will be under its direction and administration. Moreover, the Council will always be requested by the Executive Power to suggest the instructions to be issued to the negotiators of such sanitary treaties or conventions as the Republic may desire to celebrate with other countries.

The Maritime Inspector of Health, Dr. Luis D. Brusco, has codified all the legal provisions with regard to his office. This important Maritime Sanitary Code will be delivered on request to the delegates and to any other persons who may be interested in the question.

## 16. LEGISLATIVE ACTION

In addition to the above, the Parliament, from the Sixth Conference until the present time, has occupied itself with various questions of social importance closely related to public hygiene.

Without entering into an analysis of this interesting labor as foreign to the nature of this Conference, we cannot omit to mention that both Chambers have in their midst a special "Committee on Hygiene," to report on all questions of a legal and sanitary character.

Among other matters recently submitted to the legislative body, we shall mention those referring to the modification of the Pharmacy Law, the combat against infectious diseases and particularly against typhoid fever, the modification in the penal code referring to the negligent contagion of an infectious disease, and so forth. Other bills relate to the commerce in narcotic drugs, the hygienization of milk, female and child-labor, the control of venereal diseases, etc.

DR. JUSTO F. GONZÁLEZ,

*Member of the National Council of Hygiene,  
Professor of the Faculty of Medicine, Offi-  
cial Delegate to the Seventh Conference.*

# Report of the Director, Pan American Sanitary Bureau, to the Seventh Pan American Sanitary Conference

November 1, 1924.

Mr. Chairman, Honorable Delegates:

The Sixth International Sanitary Conference, which met in Montevideo in December, 1920, reorganized the work of the Pan American Sanitary Bureau, enlarged its activities, provided for the publication of a "Boletín de la Oficina Sanitaria Panamericana," and chose for the management of said Bureau the following officers:

Honorary Director, Dr. Pablo García Medina, Colombia;

Director, Dr. Hugh S. Cumming, United States;

Vice Director, Dr. J. H. White, United States, and

Secretary, Dr. Julio Bianchi, Guatemala.

## *Board of Directors*

Dr. J. Llambías, Argentina;

Dr. Carlos Chagas, Brazil;

Dr. Juan Guiteras, Cuba, and

Dr. Luis Razetti, Venezuela.

Dr. Juan Guiteras having resigned from the Board of Directors, Dr. Mario G. Lebrede, Director of the "Las Animas" Hospital and Chief of the Section of Epidemiology, of Cuba, was elected to fill the vacancy.

Articles XXXVI and XXXVII of the Resolutions adopted by the Sixth International Sanitary Conference, referring to the Pan American Sanitary Bureau, are as follows:

XXXVI. Recommend that the International Sanitary Bureau of Washington study a plan for founding and maintaining an "International Bulletin of the American Republics", and that said plan be included in the program of the Seventh Conference.

XXXVII. Provide that the International Sanitary Bureau of Washington be reorganized in the following manner:

a. The Bureau shall be composed of seven members, one of whom shall be the Director, another the Vice-Director, and a third a Secretary, all appointed by the Seventh Conference and by each succeeding Conference.

b. In each Conference there shall be selected an Honorary Director who shall be appointed from among the chiefs of the Departments of Hygiene or of Public Health of the American Republics.

c. In the interval between the Conferences the vacancies of members which may occur shall be filled immediately by a majority vote of the remaining members.

d. The duties of the International Sanitary Bureau shall be in accord with that which was approved in the Second International Sanitary Convention of the American States and in the First International Sanitary Conference, and shall publish a monthly Bulletin entitled: "Informes Mensuales de Sanidad Panamericana de la Oficina Sanitaria Internacional."<sup>1</sup>

e. The said publication shall be in the English and Spanish languages.

f. For carrying out the foregoing a credit of \$20,000 shall be available, which sum shall be apportioned among the signatory Governments following the system of prorating used for the maintenance of the Pan American Union.

g. The International Bureau shall formulate rules and regulations for its internal administration which it shall put in force immediately, but which shall be submitted to the ratification and approval of the Seventh International Sanitary Conference.

h. The members of the International Sanitary Bureau who reside a long distance from Washington, in case of inability to attend, may be represented by their respective diplomatic agents, or by persons appointed by the respective Governments.

Although in a sense an independent organization, the Pan American Sanitary Bureau, under resolutions of Pan American International Congresses and of Pan American International Sanitary Conferences, is housed in the Pan American Union Building in Washington, and its activities are carried on in close cooperation with the work of the Pan American Union. Dr. L. S. Rowe, Director General of the Pan American Union, together with members of the Governing Board of said Union, are cooperating in the heartiest manner with the Director of the Pan American Sanitary Bureau and his assistants in furthering the work of said Bureau.

Among the important activities worthy of special mention carried on by the Pan American Sanitary Bureau, since the assembling of the Sixth International Sanitary Conference, are the following: The publishing of the Minutes of that Conference; the issuance monthly in Spanish of a Pan American Sanitary Bulletin; the publication of special Portuguese Bulletins, and the compilation of a Handbook for the use of delegates to the Seventh Pan American Sanitary Conference, which Handbook contains a tentative Pan American Sanitary Code for submission to the Seventh Pan American Conference.

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<sup>1</sup> Later this title was changed to "Boletín Panamericano de Sanidad de la Oficina Sanitaria Internacional," and was afterwards changed by the Fifth International American Conference to "Boletín de la Oficina Sanitaria Panamericana."

In the carrying on of the work of the Pan American Sanitary Bureau it was necessary for the Director to appoint an assistant—Dr. J. D. Long of the U. S. Public Health Service, and an executive clerk, in order that close cooperation might be maintained with the other officers of the Pan American Sanitary Bureau, as well as with members of the Public Health Service of the United States, of whom the following rendered active and valuable services: Doctors J. D. Long, B. J. Lloyd, J. H. Linson, W. C. Rucker, and Miss Lucy Minniegerode, Superintendent of Nurses, Public Health Service.

During the past three years numerous inquiries for information concerning sanitary engineering problems—especially with reference to the purification of water by the use of chlorine—garbage disposal, fumigation of vessels, information concerning smallpox vaccination and smallpox films for educational and health propaganda purposes, the procuring of lecturers for medical instruction versed in special subjects relating to sanitation and allied subjects, the establishment of schools for nurses and the development of nursing and visiting nurse services, have been received and detailed information given concerning same.

During the period referred to a work of considerable importance was carried on by Dr. J. D. Long, Assistant Surgeon General of the U. S. Public Health Service and Assistant to the Director, through visits, in representation of the Pan American Sanitary Bureau, to a number of Latin American countries, which enabled him to establish close contact with the health authorities of the different Republics, make a general survey of conditions there, and to outline a plan for extending the usefulness of the Pan American Sanitary Bureau.

Dr. Long was accredited as a delegate of the Pan American Union and of the Pan American Sanitary Bureau to the Conference of the League of Red Cross Societies, which met in Buenos Aires from November 25 to December 9, 1923, at which Conference a number of resolutions were passed tending toward the improvement of public health and social welfare, to the development of the Red Cross spirit and the ultimate formation of Red Cross organizations. Dr. Long also attended the Fifth International Conference of American States, held in Santiago, Chile, March 25 to May 3, 1923, and the Conference of the Quarantine Authorities of the West Coast of South America, held in the City of Panama, February 25 to 28, 1924. At both of these Conferences a number of resolutions were passed relative to public health and maritime quarantine, which will eventually assist in improving the public health of the countries of the Pan American

Union, in expediting commerce and in standardizing quarantine procedure.

The appropriation of \$5,000 annually, recommended by the Second International Conference of American States to provide for the functioning of the Pan American Sanitary Bureau having proved wholly insufficient to meet its needs, the Sixth International Sanitary Conference increased this amount to \$20,000 per annum, and it is upon this basis that the plans for the carrying on of the work of the Pan American Sanitary Bureau during the past three years have been made. Experience has shown that even the latter amount is insufficient to meet the growing needs of the Bureau and enable it to enlarge its activities in accordance with carefully formulated plans, the carrying out of which will redound to the benefit of all the countries of the Western Hemisphere, and for this reason the Pan American Sanitary Bureau recommends that the annual appropriation for the functioning of the Bureau be increased to \$50,000.

Attached to this report, marked "Annex No. 1," are statements of the receipts and expenditures of the Bureau covering the three-year period during which it has been actively functioning. These statements explain themselves.

"Annex No. 2," which accompanies this report, consists of a collection of the publications of the Pan American Sanitary Bureau since the assembling of the Sixth International Sanitary Conference. These publications are likewise self-explanatory.

Respectfully submitted,

H. S. CUMMING,

*Director, Surgeon General*

*U. S. Public Health Service.*

**ANNEX NO. 1**

**STATEMENT OF RECEIPTS AND EXPENDITURES OF THE PAN AMERICAN  
SANITARY BUREAU FOR THE FISCAL YEARS 1921-1922,  
1922-1923, 1923-1924**

Balance July 1, 1921.....	\$4,600.24
Quotas received during 1921-22.....	2,830.79
<b>Total.....</b>	<b>\$7,431.03</b>
Expenditures during 1921-22.....	2,830.79
<b>Balance July 1, 1922.....</b>	<b>\$4,600.24</b>
Quotas received during 1922-23.....	11,466.58
<b>Total.....</b>	<b>\$16,066.82</b>
Expenditures during 1922-23.....	10,382.11
<b>Balance July 1, 1923.....</b>	<b>\$5,684.71</b>
Quotas received during 1923-24.....	20,672.36
<b>Total.....</b>	<b>\$26,357.07</b>
Expenditures during 1923-24.....	11,154.29
<b>Balance July 1, 1924.....</b>	<b>\$15,202.78</b>

**EXPENDITURES 1921-22**

Salary of Executive Clerk.....	\$2,550.00
Publishing Bulletin.....	122.25
Translations.....	63.92
Office Furniture and Equipment.....	84.45
Traveling Expenses.....	4.67
Books.....	5.50
<b>Total.....</b>	<b>\$2,830.79</b>

## EXPENDITURES 1922-23

Salary of Executive Clerk.....	\$2,650.00
Printing Bulletins, pamphlets, and the Resolutions of the Sixth Conference.....	4,315.08
Translations .....	2,198.21
Traveling Expenses of Representative of Bureau.....	303.79
Office Furniture and Equipment.....	502.46
Clerical Services.....	98.45
Books .....	80.85
Stationery .....	231.55
Telegrams and Cablegrams.....	1.72
<b>Total.....</b>	<b>\$10,382.11</b>

## EXPENDITURES 1923-24

## Salaries:

Executive Clerk.....	\$2,675.00
Editorial Assistant (7-1-23—3-14-24).....	846.67
Clerical Assistant (11-15-23—6-30-24).....	765.00
Stenographer (3-26-24—5-31-24).....	330.00
	<hr/>
	\$4,616.67
Printing Bulletins and the Pamphlets on the Seventh Conference .....	2,388.61
Translations .....	1,919.18
Traveling Expenses of Representative of the Bureau on three trips .....	1,911.38
Office Furniture and Equipment.....	41.92
Stationery and Supplies.....	130.97
Typist's Services.....	30.75
Books .....	34.57
Telegrams and Cablegrams.....	80.24
<b>Total.....</b>	<b>\$11,154.29</b>

**Aug. 15, 1924.**

**ANNEX NO. 2****LIST OF PUBLICATIONS OF THE PAN AMERICAN SANITARY BUREAU**

Boletín de la Oficina Sanitaria Panamericana, May, 1922 to November, 1924, inclusive; 31 Bulletins (Spanish).

Boletim Especial da Repartição Sanitaria Panamericana; May, 1923 to November 1924, inclusive; 10 Bulletins (Portuguese).

Resolutions of the Sixth International Sanitary Conference, held in Montevideo December 12 to 20, 1920; one pamphlet; Spanish-Portuguese-English.

Official Notice Assembling Seventh Pan American Sanitary Conference to be held in Havana, Nov. 5 to 15, 1924; 3 pamphlets; Spanish-Portuguese-English.

Actas de la Sexta Conferencia Sanitaria Internacional de las Repúblicas Americanas; one volume (Spanish).

The Pan American Maritime Sanitary Code; a Handbook for Delegates to the Seventh Pan American Sanitary Conference.

*Special Bulletins Prepared by the Pan American Sanitary Bureau  
and Published by the Pan American Union:*

Los Últimos Progresos en la Sanidad Pública; Agosto, 1921.

A Saude Publica en Alguns de Seus Aspectos Modernos; Setembro, 1924.

El Paludismo y el Esfuerzo Comunal para Destruirlo; Noviembre, 1922.

Boletim da União Pan-Americana; Esforço Comunal para a Eliminação da Malaria; Dezembro, 1922.

La Mortalidad Infantil y Métodos para Combatirla; Julio, 1923.

A Mortalidade Infantil e Os Meios de a Reduzir; Agosto, 1923.



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