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## The Quest For Public Health

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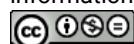
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THE QUEST FOR PUBLIC HEALTH

by

Gertrude G. Curtin

A Thesis Submitted in Partial Fulfillment of  
the Requirements for the Degree of  
Master of Arts  
in  
Loyola University  
August, 1942

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degree of Master of Arts in the field of United States  
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CHAPTER I  
EVILS ASSOCIATED WITH THE NEGLECT  
OF PUBLIC HEALTH

Romance and science, adventure and martyrdom, history, war, and peace are the structures upon which has been laid the foundation of public health. In every age, from the beginning of recorded fact through to the present, a concrete contribution has been added to the structure. Today myriad workers, implements, and instruments constitute the vast tower of strength which has through world-wide activities alleviated the scourge of mankind--disease. Medicine today is practiced as a science, making use of every scientific aid. Public health and preventive medicine are so closely allied as to be almost synonymous terms. Continuous research for the source and spread of infection accompanied by the study of prevention, has removed the probability element from diagnosis and conquered the varying scientific components of disease.

Prior to the century of preventive medicine and civic sanitation, good health and longevity were regarded as special physical endowments of the lucky ones. The work of scientists like Owen, Koch, Lister, Virchow, Loeffler, Pasteur, Schultze, Klebs, and Gaffsky removed old-fashioned superstitions, and were the leaders in developing and educating the public to the value of sanitation and preventivity.<sup>1</sup>

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<sup>1</sup>A Half Century of Public Health. Jubilee Historical Volume of the American Public Health Association in Commemoration of the 50th Anniversary Celebration of Its Foundation, p. 11. Edited by Mazych p. Ravenal, M.D., published by the American Public Health Association, New York, 1921. (A group of 19 monographs all related to the general topic of public health.)

Actual sanitary progress made in America today is due chiefly to the creditable work done by those advancing the cause of public health through community control.<sup>2</sup> The awakening of the public conscience is a gratifying tribute to their efforts, and concerns the well-being of each citizen in our modern world.

Diseases of epidemical proportions as listed by the United States Bureau of Public Health Service are the following: plagues--bubonic, pneumonic, and smallpox; fevers--typhus, typhoid, and yellow; tuberculosis and syphilis. The discovery, classification, and prevention of each has a very interesting historical background.

The history of the world has, undoubtedly, been influenced by disease. According to Dr. Major, disease was a most powerful factor in shaping world events.

In the foreword he describes disease as being a cause of defeat in warfare; as an important element in the destruction of explorers and colonizers, and as an influence upon the minds of leaders and statesmen. The author declares that disease is a "dominant phenomenon sweeping down through the centuries changing the course of history by striking with equal impartiality at races and at their leaders."<sup>3</sup>

The following paragraphs will review briefly the historical background of the epidemiological diseases.

The Golden Age of Athens died with Pericles (429 B.C.)--Pericles died

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<sup>2</sup>Ibid., p. 133.

<sup>3</sup>Ralph H. Major, Disease and Destiny, New York, D. Appleton Century Company, Inc., 1936, p. vii.

with the plague or Black Death. During the Golden Age, Athens reached the height of military and naval supremacy. But its intellectual achievements in literature, art, drama, and philosophy were greater than its physical conquests. The last of the peloponnesian Wars (400-370 B.C.) completed the downfall of Athens. Neighboring peoples flocked within the walls of Athens in order to escape the wrath of the Spartans. They lived inside the walls in unbelievable filth and misery, and were quickly attacked by pestilence. The Spartans did not enter the city because of the pestilence and the Athenians were left to combat it.<sup>4</sup>

The plague raged for two years, subsided a year, and returned, taking as toll one-third of the Athenian population. The Black Death reduced Athens to a state of inconsequential ineffectiveness. The Black Death was the bubonic plague.<sup>5</sup>

Bubonic plague spread from China to Iceland and has been described in all the languages of Europe and Asia.<sup>6</sup> Its origin was traced to the Orient. It was introduced to Europe from the Near East by a Genoese ship docking at Messina, Sicily, in 1347. The disease spread through Sicily, Italy, and Avignon, the see of Pope Clement VI. Germany, Russia, Poland, Holland, and England were afflicted with the scourge. The plague remained prevalent throughout Europe during the early part of the nineteenth century.<sup>8</sup>

Major claims that plague was of paramount importance in the following

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<sup>4</sup>Ibid., p. 2.

<sup>5</sup>Ibid., p. 7.

<sup>6</sup>Ibid.

<sup>7</sup>Ibid., p. 11.

<sup>8</sup>Ibid., p. 38.

historical events: a contributory factor to the economic upheaval of the Middle Ages;<sup>9</sup> one of the causes of the Protestant Revolt;<sup>10</sup> and that it added to the downfall of Venice in 1630.<sup>11</sup> The village of Oberammergau in the Bavarian Tyrol bases its tradition of the Passion Play upon its escape of the dreadful epidemic.<sup>12</sup> The year 1665 marked the "Great Plague of London";<sup>13</sup> and as a result of this scourge devotion spread to Saint Roche who became known as the patron saint of the disease.<sup>14</sup> The Black Death lowered the moral standards of any infected areas.<sup>15</sup>

A study of the plague led to the discovery of the germ theory of bacteriology. The father of the theory was Athanasium Kircher, a Jesuit born in Fulda, Germany (1602-1680).<sup>16</sup> The science of bacteriology made rapid advances. After his discovery rapid advancement was made in the science of bacteriology. Upon the outbreak of plague in Japan in 1894, a physician, Shebasaburo Kitasato,<sup>17</sup> discovered the germ causing the disease. It became known as the bacillus pestis.

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<sup>9</sup>Ibid., p. 24.

<sup>10</sup>Ibid., p. 25. The Catholic Church in England and Germany was profoundly affected by the Black Death or bubonic plague, because numerous clergy died with it, leaving a dearth of well-grounded ecclesiastics. The inferiority and lack of sincerity in those filling the vacancies reflected in many of the faithful, making them prey to the ever-increasing religious fallacies arising in Europe.

<sup>11</sup>Ibid., p. 33.

<sup>12</sup>Ibid.

<sup>13</sup>Ibid., p. 25.

<sup>14</sup>Ibid., p. 8.

<sup>15</sup>Ibid., p. 23.

<sup>16</sup>Fielding H. Garrison, A.B., M.D., An Introduction to the History of Medicine with Medical Chronology, Suggestions for Study and Bibliographical Data. Philadelphia, W. B. Saunders Company, 1929. 4th edition, revised and enlarged. p. 252.

<sup>17</sup>Ibid., p. 746.

A Frenchman, Alexander Yersin,<sup>18</sup> working in Hongkong, China, made the same discovery as that of Kitasato (in the same year, 1894); but without knowledge of the former's discovery.

Proof was established that the disease was borne by flea-infected rats. With the advance of sanitation, and the destruction of rats and other vermin, plague has practically disappeared from the world. When the plague appears today, a rigid quarantine is enforced and a relentless campaign instituted against the destruction of rats.<sup>19</sup>

In 1900 a terrific alarm spread throughout the United States of an epidemic of bubonic plague. But the fear was unjustified.

December, 1899, marked the introduction of the "Black Death" to Manila, Philippine Islands. By that time sufficient proof placed the rat as the culprit in spreading the disease. Constant research resulted in the following information. Scientists working in infected areas learned that rats and fleas were closely allied with the spread of the disease. The plague-stricken rodent suffered from fever and septicemia. The flea that spread the plague was the Pulvex cheopis. It has a hollow tube or epipharynx that pierces the skin; the jaws enlarge and lacerate the opening, and saliva from the flea flows through the epipharynx into the wound creating congestion. The congested blood is sucked through the hypopharynx. Since the cheopis and astia fleas have no esophagus they regurgitate if swallowing an overdose of blood. If the flea is infected, the fluid contains plague bacilli. When the rodent

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<sup>18</sup>Ibid., p. 894.

<sup>19</sup>Major, op. cit., p. 40.

dies and the flea departs, it can retain an active germ for two months.

The laboring classes in the tropics made it very easy for the flea to attack since they were nearly always barefoot and unclothed to the knee. The accompanying scratching inflamed the wound, thus giving greater access to the plague bacilli. The usual period of development was forty-eight hours, ordinarily followed by death between the third and fifth days.<sup>20</sup>

During the sixteenth century the control of Europe lay between the rival monarchs, Charles V, King of Spain, who was also contender for the title of Emperor of the Holy Roman Empire, and King Francis I of France.<sup>21</sup> The "spotted-fever" epidemic in 1528 was a strong ally for Charles because it attacked with epidemiological proportions the army of Francis, while engaged in Naples. Charles's ally turned traitor in 1552 when the disease attacked his forces. Continuous warfare and widespread battle fronts carried the disease throughout Europe.

Jerome Cordan<sup>22</sup> a physician, author, and gambler in low repute among the medical profession of his day, published in Milan in 1550 a treatise called "On the Bad Practice of Medicine in Common Use." It contained the first reference to the disease known today as typhus fever. He referred to it as the "flea-bite disease." Giralamo Fracastro,<sup>23</sup> a graduate from the University of Padua, as was Cordan, but with a much more respected rating, pub-

<sup>20</sup>Victor Heiser, An American Doctor's Odyssey, Adventures in Forty-five Countries, New York, W. W. Norton & Co., Inc., 1936, p. 75.

<sup>21</sup>Carlton J. H. Hayes, A Political and Cultural History of Modern Europe. Volume I, Three Centuries of Predominantly Agricultural Society, 1500-1830, New York, The Macmillan Company, 1936, pp. 223-41.

<sup>22</sup>Garrison, op. cit., p. 203.

<sup>23</sup>Ibid., p. 227.

lished a volume on "Contagious Diseases." One chapter, "Spotted Fever," corresponds to Cordan's "flea-bite disease."

English prison conditions were notorious throughout Europe. The superstitious of the times believed the prisoners were able to take revenge upon their jailers and punishers by afflicting them with "Black Assizes." Those becoming afflicted were always the ones sitting nearest the prisoners, such as magistrates, attorneys, and witnesses.

Doctor James Lind,<sup>24</sup> a British naval surgeon, made a detailed study of the disease in France, Spain, and England. He reached the obvious conclusion that every felon should be deloused and his garments disinfected upon entry into prison.

William Wood Gerhart,<sup>25</sup> a young Philadelphia physician, discovered in 1828 that jail-fever, spotted fever, famine fever, and ship fever were the same and had no relation to typhoid fever. But the disease continued to take its annual toll of life, and it was generally conceded that typhus took its greatest toll among the poor, wretched, unsanitary, and underprivileged.

Charles Nicolle,<sup>26</sup> a native of Rouen, France, appointed director of the Pasteur Institute in Tunis, Africa, exploded, in 1903, the theory of contagion in typhus. Nicolle spent much of his time in studying the disease, and learned it could be produced in a chimpanzee by the injection of a small amount of blood from a patient in an acute stage of the disease.

Upon admission to the hospital all patients were thoroughly cleansed and

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<sup>24</sup>Ibid., p. 375.

<sup>25</sup>Ibid., p. 463.

<sup>26</sup>Ibid., p. 706.

received fresh clothing. An infected patient could be placed beside an uninfected one without spreading the disease. But many attendants in the receiving departments contracted typhus. This attracted Nicolle's attention to the condition of the patient's clothing. He discovered bedbugs, lice, and fleas.

Continuing his investigation, he inoculated a monkey with typhus virus. As soon as the fever appeared, he allowed the monkey to be bitten by lice which were then removed and placed on healthy monkeys. They all became ill with the disease within the course of three weeks.

Nicolle's work gave renewed stimulus to the search for the germ causing the disease. A disease of Mexico known for many years as tabardillo was investigated by a Chicagoan, Dr. Howard Q. Ricketts<sup>27</sup> and Russell Wilder<sup>28</sup> (1910). Their findings proved that organisms found in the blood stream of those infected with typhus and tabardillo were similar to those in lice. Rickett was a scientific martyr, dying of the disease in the American Hospital in Mexico City. Other bacteriologists carried on the study and confirmed Ricketts' discovery and named the germ Rickettsia.<sup>29</sup>

Typhus is the most distinguishable of fever maladies classified as Rickettsia diseases. Related fevers are French or Volksynian, Japanese River Valley or Tsutsugamushi, Rocky Mountain spotted fever, and tick fever. The virus of these fevers is transmitted to man by insects.

Body and head lice carry the disease from one human being to another.

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<sup>27</sup>Ibid., p. 522.

<sup>28</sup>Ibid., p. 706.

<sup>29</sup>Major, op. cit., p. 72.

But cases developed where the louse transmission was excluded. Research located the source of infection as being a typhus virus in the rat flea and in the rat. It is perpetuated by transmission from rat to rat, by rat fleas and lice. Rat fleas feed upon man when driven to seek a new host by the death of an old one. The bite produces typhus in man. If the individual is living in a louse-infected community the consequences may become epidemiological in scope.<sup>30</sup>

Zinsser points out the curious though heartening fact that international co-operation in the prevention of epidemics continues no matter how hostile other world relationships may become. Organized governmental agencies keep in continuous contact information concerning epidemic diseases. Sanitarians, bacteriologists, epidemiologists, and health administrators co-operate, consult, and freely interchange views, materials, and methods from Russia to South America and from Scandinavia to the tropics. During the most turbulent period of the Red Russian Revolution (1917), the only official relationship to remain open was that between the Health Commissioner of the League of Nations and the Soviet government.<sup>31</sup>

At the beginning of the twentieth century, there were localized typhus epidemics in China, Mexico, North Africa, and the Near East. The rate in Ireland as in South America is rapidly declining. In New York and Boston

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<sup>30</sup>Hans Zinsser, Rats, Lice, and History, The Atlantic Monthly Press, Little Brown & Co., 1936. Being a study in biography, after twelve preliminary chapters indispensable for the preparation of the lay reader, deals with the life history of typhus fever. P. 222.

<sup>31</sup>Ibid., p. 293.

from 1900 to 1930 only 528 cases of Brills' Disease were reported.<sup>32</sup> But Russia, Poland, Galicia, and Eastern Austria had sufficient cases and deaths to be considered epidemic centers.

Typhus reached epidemic proportions in Serbia, 1914, where it broke out among the army. Concentration of the fever began with the internment of Austrian prisoners at Valjevo, Serbia. The wandering homeless population and troop movement spread the disease so rapidly that from November, 1914, to April, 1915, it is estimated that 150,000 died. But it remained within the borders of Serbia and thus prevented an attack by the Central Powers. Thus, again typhus was an important fortress upon the field of battle.

Though typhus spread on the Eastern front, the extraordinary effective methods of sanitation used by the Germans kept it in check. Although the disease penetrated the prison camps of Central Europe, it was prevented from spreading among the civilian population. Zinsser, offers as an explanation, the reason both Western and Eastern fronts were not more seriously ravaged by typhus, was the awareness and fear of the disease and so took the utmost precautions to prohibit its spread by wholesale delousing. Russia suffered the most heavily from the scourge. Records were inaccurate from 1917 to 1921 but Tarassewitch<sup>33</sup> made a conservative estimate that there were over twenty-five million cases of typhus in the Union of Soviet Socialist Republics and that the death toll was from two and one-half to three million.<sup>34</sup> A recent commentary on the development of typhus is the experiment and experience of

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<sup>32</sup>Brills' Disease is typhus in a less virulent strain.

<sup>33</sup>Garrison, op. cit.

<sup>34</sup>Zinsser, op. cit., p. 299.

Dr. Dyer.<sup>35</sup>

Dr. Rolla Dyer of the United States Public Health Service was seeking the cause of typhus as a result of an epidemic in Baltimore. The focal point of the infection seemed to be a cellar overrun with rats. Dyer had some of them shipped to his laboratory. They were teeming with the flea already designated as the carrier of bubonic plague. He injected guinea pigs with a broth made from the macerated fleas and successfully proved that phase of transmission. He was working on the last, namely the transmission to man, when he himself was bitten by a flea. Within two weeks Dyer was dangerously ill. Though he recovered from the typhus he proved that typhus is carried by rats and fleas. He has continued his experimentations and proved that field-mice, possums, squirrels, and rabbits also harbor the typhus flea.

Dr. Zinsser concluded his monograph with the following quotation:

Typhus is not dead. It will live on for centuries, and it will continue to break into the open whenever human stupidity and brutality give it a chance, as most likely they occasionally will. But its freedom of action is being restricted, and more and more it will be confined, like other savage creatures in the zoological gardens of controlled diseases.<sup>36</sup>

To quote Dr. Major, concerning tuberculosis is the following statement. "The astonishing decline in the death rate from tuberculosis is one of the most spectacular and significant events in the history of our times."<sup>37</sup> Even

<sup>35</sup>Medical Economics, July, 1941. "A Contemporary Medical Martyr." Published by Medical Economics, Inc., Rutherford, New Jersey. Editor, H. Sheridan Bacetal, M.D., M.A. It is issued monthly in booklet form to members of the medical profession.

<sup>36</sup>Zinsser, op. cit., p. 301.

<sup>37</sup>Major, op. cit., p. 104.

so, when Hippocrates changed medical history from the mythological to the written record stage, Greeks applied methods to those afflicted with the disease similarly to methods used today, namely, mountain sanitariums, an abundance of fresh air and sunshine, rest, and a high calory diet.

The history of tuberculosis, previously known as scrofula, has an interesting background in the source of its cure. \* The Royal Touch of the ruling powers of Europe was believed to be miraculous. The art of healing by the Royal Touch began in France with King Clovis in 496 A.D. It was instituted in England with the rule of Edward the Confessor (1003-January 5, 1066), one of the few kings ever to be canonized by the Roman Catholic Church.<sup>38</sup>

It was believed that this healing was transferred or inherited in the royal lineage. From 1050 to 1715 every English monarch participated in the practice of Touching in order to cure scrofula. Kings, clergy, nobles, and the people all had great faith in the efficacy of the Touch.

Charles X revived the ceremony upon his coronation. Guillaume Dupuytren,<sup>39</sup> considered then the greatest surgeon in France, and Jean Louis Ali bert,<sup>40</sup> founder of the French School of Dermatology, presented one hundred and twenty-five scrofula patients to the king to receive his healing touch.

The pages of history are generously annotated by events accomplished by those afflicted with the dread disease. John Bunyan described it as the "Captain of Death." The great accomplishments of Francisco Bernardone of

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<sup>38</sup>Edward the Confessor was canonized by Pope Alexander III in 1161. His feast is celebrated October 13. The Catholic Encyclopedia, V. 5.

<sup>39</sup>Garrison, op. cit., p. 489.

<sup>40</sup>Ibid., p. 417.

Umbrian, Assisi, Italy, were credited to the disease. He is known to the world as Saint Francis of Assisi. The infection was considerate of neither age, social level, profession, culture, wealth, or poverty.

To return to the efficacy of the Royal Touch, Sir D'Arcy Power,<sup>41</sup> eminent medical historian, offered the following solution. It took several weeks of travel, mostly in open wagons, sleeping out of doors, and a more generous distribution of food while en route to London, for the ceremony of the "laying on of hands." Those permitted to make the journey had only mild infections, with the stimulation of their belief and sufficient light and food, the miracle was not too difficult to prove.<sup>42</sup> The first step in the solution of the cause of the disease was the discovery of tubercles in the Seventeenth Century, by a professor at Leyden, Franciscus Sybrius;<sup>43</sup> thus the derivation of the name, tuberculosis. Secondly, Jean Antoine Villemin,<sup>44</sup> a French physician discovered the element of contagion about 1865. He proved his theory by inoculating a healthy rabbit with secretions from a tubercular lung, and so created the infection. Up to this time scrofula was not associated with tuberculosis, but Villemin proved they were identical (1865-69).<sup>45</sup>

These findings were published in 1868. Robert Koch<sup>46</sup> of Berlin electrified the world by discovering, in 1882, the germ causing tuberculosis. The

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<sup>41</sup>Ibid., p. 158.

<sup>42</sup>Major, op. cit., p. 93.

<sup>43</sup>Garrison, op. cit., p. 222.

<sup>44</sup>Ibid., p. 616.

<sup>45</sup>A Reference Handbook of the Medical Sciences. Embracing the Entire Range of Scientific and Practical Medicine and Allied Science. By Various Writers. New York, William Wood and Company, 1923. 4th edition. VIII, 484.

<sup>46</sup>Garrison, op. cit., p. 622.

germ was found to be particularly hardy. Dr. Heisser claimed the frail physique, low economic and hygienic living conditions of the Filipino, as well as his inability to secure nutritious food made him especially susceptible to the disease. Furthermore tropical climatic conditions are not conducive to good dairy produce. The general use of milk in the Islands was practically unknown.<sup>47</sup> Sunshine and fresh air, proper diet, and cleanliness are the great enemies of tuberculosis. The proper education of the patient to help him understand his condition and not spread the infection is of paramount importance.

The origin of smallpox is shrouded in the world of antiquity. The world accepted it along with war, famine, and earthquake. However, modern historians of disease have concluded that the natural habitat of smallpox was Central Africa and India from where it gradually circled the globe. The first great recorded epidemic occurred in Rome, about 164 A.D. The first case in the Western Hemisphere appeared shortly after Columbus's first voyage. Mexico had an epidemic in 1520, and Boston in 1649.<sup>48</sup> Rhazes,<sup>49</sup> an Arabian physician, was the first to distinguish smallpox from other types of skin diseases, particularly measles. The introduction of it into the New World from the Old worked as much havoc among the aborigines as did the use of munitions.

The early treatment of the disease was inoculation, which Major believed originated in China. Inoculation consisted of injecting into a healthy person a small amount of pus from a smallpox lesion, thus producing a mild attack

<sup>47</sup>Heisser, op. cit., p. 202.

<sup>48</sup>Major, op. cit., p. 113.

<sup>49</sup>Garrison, op. cit., p. 119.

of the disease. England received credit for the introduction of inoculation in Europe.

Edward Jenner,<sup>50</sup> the genius of vaccination, began an investigation of cowpox, while serving his apprenticeship to a country doctor near Bristol, England. While completing his studies in London he became a pupil and close friend of the famous surgeon, John Hunter.<sup>51</sup> Upon completion of his studies he returned to a country practice in Berkely. An epidemic broke out here in 1796.

Jenner began his experiment: he took pus from a sore on the hand of a dairy-maid, Sarah Nelmes, ill with cowpox, and injected it into the arm of a young patient, James Phipps, May 14, 1796. A small sore covered with a scab developed and within a few days the lesion healed. Six weeks later the same child was inoculated with pus from a smallpox patient, but was immune to the disease.

Jenner continued his experiments successfully, but the medical profession was divided in opinion as to the merits of vaccination. News and experimentation spread to France, Germany, Russia, and the United States. In spite of its merits many today still disclaim the value of vaccination.

In Rome, before the temple of the Capitoline Jupiter, the highest magistrate of the Republic would on the thirteenth day of September drive nails into the temple wall. The Romans believed that for the year all plagues and pestilences that might ravage the ancient city were nailed down.

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<sup>50</sup>Ibid., p. 386.

<sup>51</sup>Ibid., p. 344.

The Romans left the best description of malaria. It was described by Horace, Tacitus, Martial, Virgil, Pliny, and Cicero. It played an important part in the downfall of Greece and Rome. It brought the Golden Age to an abrupt and dramatic end. Malaria was introduced into Greece from Africa in 500 B.C.

Sanitary conditions within the Roman capital were excellent. The sewer Cloaca Maxima kept the lowlands effectively drained. Fresh water was brought over miles of aqueducts. Refuse was disposed of through large cesspools, drains, and sewers. The homes were built to admit sufficient air and sunlight.

The peasants living beyond the capital's limits were less favored and suffered correspondingly from their living conditions. They emigrated to the city in large numbers and comprised the rabble of the city, who were idle, corrupt, slothful, and vicious. They followed any demagogue who promised ease and comfort without work. A decadent situation soon struck Rome. And when it was captured by the Goths (455 A.D.) malaria spread throughout Europe.

The discovery of quinine which became such an effective cure of malaria was accidental. It was just a matter of chance that it was found by one of the Spanish conquistadores soldiers. During Pizarro's capture of Peru (1532) malaria was rampant among his troops. One unfortunate left on the march to die quenched his thirst at a pool with an old log lying in it. Despite the bitterness of the taste he drank large quantities of the water and recovered. When he made known his discovery the log was identified as quinine. Thus was

learned its efficacy. The Jesuits imported large quantities of the bark to Spain and Italy but malaria continued its ravages.<sup>52</sup>

In 1878 Lavern,<sup>53</sup> a French army surgeon stationed at Bone Hospital in Algeria, began to study the blood and organs of patients who had died with the fever. He found cells which contained small black granules, which he suspected were parasites. Two years later at Constantine, Algeria, he had ample opportunity to investigate the parasite. Lavern resigned from the army to accept a post at the Pasteur Institute where he remained until his death in 1921. For his contribution to parasitology he was awarded the Nobel Prize in 1907.

The first person to associate the cause of malaria with the mosquito was the American scientist, Albert F. A. King.<sup>54</sup> He noted that the disease appeared in mosquito infected districts and abounded during the mosquito season. Exposure to night air was considered a factor but he associated that reason with the insect's habit of traveling and generally attacking at night. Lastly, the bad air rising from swamps was filled with mosquitoes.

Ronald Ross,<sup>55</sup> attached to the British Army Medical Service in India, for seven years, followed King's theory. He spent three years of investigation in trying to find in the body of a mosquito which had bitten a malarial

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52 Quinine was known by a variety of names, one of them being "Jesuit's Bark." This term came from the fact that Spanish Jesuit missionaries in Peru learned the healing quality of quinine, or cinchona bark, from the natives when one of the priests was cured of an attack of malarial fever through its use. The Catholic Encyclopedia. Volume VIII, p. 372-3.

53 Garrison, op. cit., p. 707.

54 Ibid., p. 583.

55 Ibid., p. 707.

patient the parasite which caused the disease. His work was rewarded by the discovery of the fatal cells in the body of an anopheles mosquito.

The Spaniards became acquainted with yellow fever in Mexico, Central and South America, and the West Indies. The British, Portuguese, and Dutch explorers in this region also encountered it. Yellow fever derived its name from the jaundiced color accompanying the disease. Always present in the West Indies, traders carried it to the American colonies.

A Cuban physician, Carlo Finlay,<sup>56</sup> conducted an extensive study which is as follows: The female mosquito sucks blood, while the male feeds on vegetation. He classified the stegomyia fasciata, a prolific breeder, as being most prevalent in Havana. The insect was captured while biting, by placing a vial over it. Then while encased it was placed on the arm of a yellow-fever patient. When satiated, the mosquito was removed to permit digestion. The digestive process took from three to four days. Again she was placed on the arm of a healthy individual who became infected after the bite. Dr. Finlay published his experiments in the American Journal of Medical Sciences in 1889. But little credence was given to his report.<sup>57</sup> During the Spanish-American War while American troops were stationed in Cuba fever broke out among them. Over 50 per cent of the armed force were attacked with it.<sup>58</sup>

In summarizing this chapter I have tried to present a picture of the superstitions, sources of infection, spread of the disease, discovery of its

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56 Ibid., p. 718.

57 Major, op. cit., p. 241.

58 Encyclopaedia Britannica, A New Survey of Universal Knowledge, 14th ed., XXI, 152. Chicago, Encyclopaedia Britannica Corporation.

origin, and finally the scientific methods of prevention, applied to epidemiological diseases and plagues. Dr. Haven Emerson read before the Detroit Medical Association a paper from which I have chosen the following facts as being significant in bearing out the findings set forth in this chapter.

The tuberculosis death rate has decreased 32 per cent in the United States. The typhoid fever death rate has decreased 59 per cent in the United States. Except for diabetes, cancer and heart disease (all related to the rising average age of the population) death rates have fallen, largely as a result of a general high level of sanitation, personal hygiene, and improved medical skill and nursing.

Infant mortality	decreased	29	per cent	in the United States <sup>59</sup>
Maternal mortality	"	50	"	" " "
Diphtheria death rate	"	59	"	" " "
Pneumonia	" " "	31	"	" " "

These facts indicate that despite depression and unemployment the health of the people has not been neglected.<sup>60</sup>

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<sup>59</sup>I have not been able to find a date for the above quotation, but believe the years covered are approximately from 1915 to 1940.

<sup>60</sup>Ciba Symposia, Vol. II, No. 12, March, 1941 (Ciba Pharmaceutical Products, Inc., Lafayette Park, Summit, N.J.), George Rosen, editor.

## CHAPTER II

### THE ORIGIN AND DEVELOPMENT OF PUBLIC HEALTH IN THE UNITED STATES

Every movement has a variety of principles. So has Public Health. These principles have been grouped under the following divisions: philosophy, sociology, public welfare, legal, industrial, constitutional, and educational; and an effort has been made to establish the reasons for the classification.

Man's right to life is safeguarded through the operation of public health functions. Through its claim to science, and association with preventive medicine, public health has prolonged the life-span of man, and promoted his physical, personal, and mental health and efficiency, thus insuring to every citizen his birthright of health and longevity.

The constitution of the United States contains the element for man's right for the safeguarding of his health. Public health is an integral part of the document which directs the citizen's constitutional guarantee for the promotion of healthful ways of living. As this subject functions through the constitution it becomes a study of the history of our United States.

Dr. Tobey describes health as "the state of being hale, sound or whole, in body, mind, or soul, and free from physical and mental disease."<sup>1</sup> Hygienic improvements have produced a pertinent decrease in the death rate of the

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<sup>1</sup>J. A. Tobey, Public Health Law, New York, The Commonwealth Fund, 1939.  
2nd ed., p. 7.

United States which corresponds with an increase in the life-span.<sup>2</sup> The well being of each citizen is being promoted by the enlightenment of public consciousness to the cause of public health and preventive medicine.<sup>3</sup> Organizations promoting public health were mostly local organs, not given official recognition until about 1871. The societies lacked any uniformity or co-operation. However, that does not mean that public health and hygiene were non-existent before that date. According to Dr. Smith, first president of the American Public Health Association, the period from 1861 to 1871 in New York City marked the inauguration of a system which so conserved its public's health, and brought it to so high a standard as to be considered an epochal period.<sup>4</sup> In 1866 the Metropolitan Health Law was passed in New York City. General interest exhibited by sanitarians in the law led to the establishment of the American Public Health Association.

Lemuel Shattuck, a native of Boston, Massachusetts (1793-1857) is considered by many to be the American father of public health and sanitation. Shattuck, a layman, made a sanitary survey of Massachusetts in 1849 and presented his findings to the Massachusetts Sanitary Commission in 1850. His report received such widespread publicity that it is credited with awakening public consciousness to the "enormous ill-health and physical debility in American cities consequent upon unsanitary conditions."<sup>5</sup>

National Sanitary Conventions had met in Philadelphia--1857; Baltimore--

<sup>2</sup>F. H. Garrison, An Introduction to the History of Medicine, Philadelphia, W. B. Saunders and Company, 1929, p. 780.

<sup>3</sup>A Half Century of Public Health, op. cit., pp. 116-17.

<sup>4</sup>Ibid., p. 3.

<sup>5</sup>Garrison, op. cit., p. 779.

1858 and 1860; New York--1859; but these meetings were suspended for the duration of the Civil War. One important objective of the meetings was to influence Congress to institute a bureau of health at Washington, D. C., with branches throughout the United States. Through their petitions, Congress created a National Board of Health in 1879 which functioned for four years and then passed out of existence.

A few of the early dates for establishing state boards of health are the following:

- 1855, a temporary board of health in New Orleans, Louisiana
- 1869, Massachusetts
- 1870, District of Columbia
- 1871, California and Virginia
- 1872, Minnesota
- 1873, Michigan
- 1875, Alabama, Georgia, Maryland<sup>6</sup>
- 1876, Colorado and Wisconsin<sup>7</sup>

Health departments were created throughout the United States on the following dates.

Illinois	1877	New Hampshire	1881
Mississippi	1877	West Virginia	1881
North Carolina	1877	Missouri	1883
Tennessee	1877	Kansas	1885
Connecticut	1878	Maine	1885
Kentucky	1878	Pennsylvania	1885
Rhode Island	1878	Ohio	1886
South Carolina	1878	Vermont	1886
Delaware	1879	New Jersey	1887
Iowa	1880	Florida	1889
New York	1880	North Dakota	1889
Arkansas	1881	Oklahoma	1890
Indiana	1881	Nebraska	1891

<sup>6</sup>There is a discrepancy of data on Colorado and Georgia between these two references. Garrison places the respective dates at 1876-1875. Bulletin 184 quotes 1893 for Colorado and 1903 for Georgia.

<sup>7</sup>Garrison, op. cit., p. 779.

Washington	1891	Wyoming	1901
South Dakota	1895	New Mexico	1903
Louisiana	1898	Arizona	1903
Utah	1898	Oregon	1903
Montana	1901	Idaho	1907
		Nevada	No date <sup>8</sup>

By 1873, one hundred thirty-four American cities had some form of a system of health. As late as 1901 only ten states had satisfactory systems of keeping vital statistical records.

The American Public Health Association was, in reality, a forerunner of the United States Bureau of Public Health Service. As stated before, the organization was an outgrowth of interest exhibited in the Metropolitan Board of Health. The initial meeting was held, September 12, 1872, at Longbranch, New Jersey; Stephen Smith was elected president. With the contributions of Koch, Pasteur, Lister, Loeffler, Schultz, Klebs, and Gaffsky, the art of medicine was changing to the science of medicine. The influence of science upon public health was paramount. The organization gained impetus during the course of years, and gained international repute when Canada became a member in 1884, Mexico in 1892, and Cuba in 1902.

Dr. Smith was appointed by President Cleveland to represent the United States at the ninth International Sanitary Convention meeting in France in

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<sup>8</sup>Treasury Department, United States Public Health Service, Public Health Bulletin, No. 184, April 1, 1929, "Health Departments of States and Provinces of the United States and Canada." Compilation by John A. Ferrell, M.D., Dr. P.H., Wilson G. Smillie, M.D., Dr. P.H., Platt W. Covington, M.C.P.H., and Pauline A. Mead, B.Sci. in Hyg. "International Health Division of the Rockefeller Foundation for the Conference of State and Provincial Health Authorities of North America." Prepared by the Direction of the Surgeon-General. Washington, United States Government Printing Office, 1929, p. 7.

1894. A great fete was perpetuated. At this conference there was adopted a sanitary code to control the spread of cholera throughout Europe.<sup>9</sup>

The Association's membership so increased that general meetings of the organization became unwieldy. Then too such rapid advancement was made that the members became interested in specialized departments. The first unit of specialization was that of Bacteriology and Chemistry established in 1899; in 1908 Vital Statistics and Public Health Administration were added. The units of Sociology and Sanitary Engineering, Industrial Hygiene, and Food and Drugs were added in 1911, 1914, and 1917 respectively.

An official publication appeared in 1911 entitled the "Journal of the American Public Health Association," and in 1912 it became known as the "American Journal of Public Health," under which title it is published to-day.<sup>10</sup>

It is difficult to draw a sharp line of demarcation showing the specific differences between public and social welfare and public health. The three are closely allied and must of necessity co-operate to the fullest extent in their wide range of activities. Today the federal government exercises tremendous power in the co-ordination of man's civil life.

The improved health of the average citizen constitutes a moral and economic value. The social service worker is an important factor to the epoch of public health. It must be remembered that the personnel of public health is not confined to the physician, nurse, or research scientist. Sanitation,

<sup>9</sup> A Half Century of Public Health, op. cit., pp. 11.

<sup>10</sup> Ibid., p. 24.

hygienic living conditions, safe disposal of sewage and waste, careful supervision of water, milk and food supplies, proper nutrition distributed through governmental agencies to the underprivileged, medical care and instruction in the care of the home and family to the unfortunate of our society, light, air and improved housing conditions are all components of the very complex protection of public health and welfare. One could not perform its duties in our present system of living without the utmost co-operation from the other.

Dr. William H. Welch used 1848 as the date marking the advent of modern public health. He said, "for the first time in human history was the care of the health of the people fully recognized as an important administrative function of government."<sup>11</sup>

"Public health," wrote Benjamin Disraeli, "is the foundation upon which rests the happiness of the people and the power of the State. The first duty of a statesman is the care of the public health."<sup>12</sup>

Disraeli's advice may well serve as a guide to statesmen of later days, for though the fact is undeniable that public health is an essential feature of governmental principles, many need reminders.

According to Dr. Tobey, public health law is defined in the following quotation:

Public health law may be defined as that branch of jurisprudence which treats of the relation and application of the common and statutory law to the principles and procedures of hygiene, sanitary science, and public health

<sup>11</sup>W. H. Welch, Public Health in Theory and Practice, New Haven, Yale University Press, 1925, p. 11.

<sup>12</sup>J. A. Tobey, Public Health Law, New York, The Commonwealth Fund, 1939 (2nd ed.), pp. 3-15.

administration.

Public health law differs from and is not a part of medical jurisprudence, more properly known as legal medicine or forensic medicine, which is the science treating of the application of medical facts to legal principles and legal principles to medical practice.

Since medicine is the science and art dealing with the prevention, cure, or alleviation of disease, public health is sometimes considered to be a branch of medicine. Actually, however, public health is a science that is broader than medicine, because it draws for its component parts not only upon preventive medicine and to some extent upon curative medicine, but also upon the arts and sciences of engineering, biology, chemistry, biochemistry, statistics, education, sociology, and law.<sup>13</sup>

Some early sanitary laws promulgated in Europe were those of King John II of France in 1350. Edward III of England issued a royal decree prohibiting the pollution of the Thames River in 1357. Venice appointed a board of health in 1348 and during a plague epidemic established a forty-day isolation period for those infected, thus bringing into use for the first time the term quarantine. As early as 1374 Venice imposed a quarantine upon maritime commerce.

Sanitary measures, ordinances, and codes were adopted in England but received no legislative recognition until Edwin Chadwick, secretary of the Poor Law Commission, interested Queen Victoria in conditions. Her attention was attracted by a report on the sanitary conditions of the working classes, which was published by Chadwick in 1842. The Queen commissioned an investigation of conditions leading to ill health and in 1843 appointed a Royal Commission to study urban conditions. This led to the establishment of a General

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<sup>13</sup>Ibid., p. 10.

is concerned with public health.

3. To establish post offices.

4. To legislate for the District of Columbia and territories. Through appropriations granted to state health departments Congress exercises considerable influence, but may not interfere without the state's consent. However, in the District of Columbia, Territories, and Reservations, the federal authority is unlimited.

5. The power of the President with the advice and consent of the Senate to make treaties.<sup>15</sup> These refer to the adoption of international sanitary and health codes, and participation in international conventions dealing with the promotion of public health.

Just as the aim of all public programs is the ultimate improvement of community health so is a constructive health program in industry of immeasurable importance. The portent of its importance is the fact that the vast field of industrialism is comprised of adults. The child health problem has always been one of momentous concern, but upon the completion of that stage no systematic consideration was given to the adult. In view of the fact that modern industry includes forty per cent of our male and female population, public health facilities have a most fertile field for advancing the individual's health and well being. During the present century the technique of prevention and conservation, through the joint application of local, state, and federal agencies have attained such record accomplishments that few diseases have been able to withstand the intensity of their investigations.

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15. Ibid.

The aim of public health has been to afford protection to those in the home, school, and factory. Industrial hygiene must of necessity become an integral part and safeguard of the community health.

Prior to 1936 there was little organization in the potential elements procuring this safeguard. Though there still remains a vast field for industrial hygiene, the fact remains that thirty states, eight cities, and two counties have industrial divisions in their health departments, denote the significance of the movement.

The important problem facing industrial hygiene at the present is the control of occupational accidents, specific occupational diseases, and disease common to the general population whether or not employed industrially. The legal responsibility for the health and protection of the employee is a function of official public health agencies.

In order to protect and promote health, safety and efficiency among the employed and restore the disabled or ill worker to his required place in industry, co-operation is required among the personnel, medical nursing, engineering, and chemical branches of industry.<sup>16</sup> The United States Public Health Service suggests as essential factors to the industrial program, fundamental research, application of the results of the research, and education. Even though the majority of local agencies are not equipped with research facilities they may apply the results of research obtained from the Bureau, and carry out an extensive program of prevention and education. Because the

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<sup>16</sup>J. H. Bloomfield, "The Responsibility of the Nursing Profession in Industrial Hygiene," Public Health Report, Vol. 56, No. 22, May 30, 1941.

problems of industrial health are essentially those of public health.<sup>17</sup>

Due to unaccountable circumstance the development of an educational program in order to enlighten the public has been generally neglected. The fact is rather difficult to understand. The usual procedure in introducing any campaign is to herald the announcement with a great fanfare of advertising, printed material, and radio broadcasts. But the education of the public in matters pertaining to health has been haphazard. There is no central control in the presentation of information. It appears at the present time that an educational program in public health is the field most in need of development.

In our state, Illinois, the Educational Committee of the Illinois State Medical Society prepares pamphlets with general health suggestions. These are available only upon request. A few of the titles of the pamphlets are: "Do you Know," "Safe at Home," "How Is Their Vision," and "Burns."<sup>18</sup>

The University of Illinois department of Hygiene and Public Health inaugurated a press bulletin weekly service for use in the larger newspapers of Illinois. The bulletins contain authentic information on public health, hygiene, and sanitation. They are prepared by recognized authorities in their respective fields.<sup>19</sup>

In 80 per cent of our larger cities health education constitutes a minor part of the municipal health department's activities. Even though about one-half of these cities do publish health bulletins, there is a need for stand-

<sup>17</sup>M. H. Kronenberg, "Industrial Hygiene in a Public Health Program," Illinois Medical Journal, Vol. 79, No. 3, March, 1941.

<sup>18</sup>Chicago Medical Society Bulletin, Vol. 44, July 5, 1941.

<sup>19</sup>Public Health Report, Vol. 34, No. 40, Part 2, October 3, 1919.

ardization. An integral part of any health program is the alleviation of man's ignorance and to instruct him in a hygienic way of living. "No field of public health activity would reap greater benefits than a widespread educational community campaign."<sup>20</sup>

Organizations such as the Red Cross, Anti-tuberculosis Leagues, Parent-Teacher Associations, Infant Welfare Clinics, Visiting Nurse Associations, Kiwanis, Rotary, and Young Peoples Christian Associations, Boy and Girl Scouts, the American Legion, and many other groups have taken the initial step in health activity programs, lectures, and in the dissemination of health literature. But as yet the field is practically untouched in the extent of its future possibilities.<sup>21</sup>

The principles of public health as I defined them are in review man's right to a healthy, normal existence provided for him through the powers of our Constitution in their operation of the United States Public Health Service.

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<sup>20</sup>Public Health Bulletin, Vol. 34, No. 40, Part 2, p. 225.

<sup>21</sup>George Amundsen, "Public Health Education," Public Health Bulletin, No. 136, July, 1923, chap. 27, pp. 220-34.

### CHAPTER III

#### THE UNITED STATES BOARD OF PUBLIC HEALTH SERVICE

The United States Board of Public Health Service had its birth in the modest institution of maritime service. Maritime service consisted of the medical care given to seamen and the ensuing evolution of public health functions became a natural development. The United States Marine Hospital Service was inaugurated July 16, 1798, during the administration of John Adams, second president of the United States. Mr. Adams signed an Act of Congress granting provision for the establishment of hospitals to care for sick and disabled American merchant seamen.<sup>1</sup>

Care of the health of seamen was always considered a matter of prime importance. Charles II of England was sufficiently foresighted to construct a hospital in Greenwich, Connecticut, exclusively for seamen. The building was erected in 1692 and supported by a tax paid by the colonial merchants.

Our new nation appreciated the importance of a marine service both in times of war and peace. Virginia and Massachusetts were the first states to provide ample care for the health of their sailors. In 1782 the legislature of Virginia passed an act taxing sea captains one shilling for each man on board. This marine fund provided for the operation of a hospital at Norfolk County. The hospital, completed in 1787, operated until 1801 at which time

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<sup>1</sup>Brock C. Hampton, "The Public Health Service Leaves the Treasury Department," Public Health Report, Vol. 54, No. 26, June 30, 1939. Washington, D. C., United States Government Printing Office, 1939.

it was purchased by the United States Government.<sup>2</sup> The Massachusetts legislature passed an act in 1798 providing for the erection of a hospital to care for their seamen on the Island of Martha's Vineyard. Under the same act seamen also received treatment in Boston. As the country expanded new hospitals were erected along the Atlantic and Pacific coasts and at important river and Great Lakes ports.<sup>3</sup>

A natural expansion of the Marine Hospital Service was to diagnose and report diseases such as yellow fever, cholera, and smallpox upon their introduction at ports of entry, where marine hospitals happened to be established. It was also permitted to assist in the control of state and local epidemics upon request. Congress authorized revenue cutters placed in the Customs Service, under the authority of the Treasury Department, in 1799, to aid in the enforcement of state health and quarantine laws. The Marine Services aided in the control of recurrent epidemics of cholera and their medical staffs were appropriated by the North and the South during the Civil War.<sup>4</sup>

One of the oldest means for the protection of public health is quarantine. Ages before the cause of communicable diseases man learned the first principle of prevention, namely, isolation of the sick. Even in the Old Testament there are evidences of quarantine in the banishment and separation of the lepers. Commerce, quarantine, public health and preventive medicine

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<sup>2</sup>John W. Trask, "Early State Hospitals for Seamen," Public Health Report, Vol. 54, No. 21, May 26, 1939.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.

have histories all closely interwoven.<sup>5</sup>

The fundamental objective of maritime quarantine, prevention of the spread of disease, and the employment of those methods to limit and destroy infection are the same today as those of medieval times. But the acquired knowledge of the cause and spread of disease and rationalization has been added to the procedure of quarantine.<sup>6</sup>

Modern quarantine probably originated in the city-states of Italy. From 5 A.D. to 1500 A.D. general plagues recurred in Europe over sixty times. These visitations with their ensuing ravages made it incumbent upon the cities, dependent upon trade for their prosperity, to enforce a quarantine. Venice enforced a quarantine in 1348, Florence, 1374, and Lombardy and Milan in 1399.<sup>7</sup>

Venice inaugurated the plan in 1485 to detain all ships arriving from infected ports for a period of forty days, prohibiting intercourse with land or any other vessel. Some historians suggest that Venice chose a forty day quarantine because it was instituted during the Lenten season; thus associating the forty day detention period with quarantine.<sup>8</sup>

Marseilles, France, was the first city to require all incoming ships to present a bill of health or "patente," to be filled out by a responsible official at the port of departure. The patente required four statements:

1. "Patente nette," a satisfactory statement of the health condition in

<sup>5</sup>Brock Hampton, "Development of the National Maritime Quarantine System of the United States," Public Health Report, Vol. 55, No. 28, July 12, 1940.

<sup>6</sup>Ibid.

<sup>7</sup>Ibid.

<sup>8</sup>Ibid.

port at the time of sailing.

2. "Patente touchée," a statement from a ship leaving a port with infections present but having no illness on board when setting sail.

3. "Patente soupconnée," a statement concerning the existence of a malignant epidemic in port or the arrival of caravans from plague areas.

4. "Patente brute," a statement as to the existence of plague at the time of departure and any merchandise taken on board from the infected port. In addition the vessel, passengers, crew, and cargo all received a thorough inspection.<sup>9</sup>

The first quarantine legislation enacted in America was that passed by the General Court of the Massachusetts Bay Colony in March, 1648. It was aimed at the prevalence of diseases carried from the West Indies to Boston.<sup>10</sup> It is believed that some quarantine was exercised in New York under the rule of the Dutch and the English, and in Philadelphia in 1700. With the growth of our country quarantine procedures increased but they lacked uniformity until 1878 when a small measure of regularity was introduced by the federal legislature.<sup>11</sup>

Previous health laws were adopted on the following dates: 1796 (1. Statute 744) provided for Federal co-operation with the states in the enforcement of state quarantine laws. The acts were enlarged in 1799 (1. Statute 619); 1832 (4. Statute 587) and in 1866 (14 Statute 357). But 1878 is the date of some semblance of national uniformity in the quarantine laws. That bill

<sup>9</sup>Ibid.

<sup>10</sup>A Half Century of Public Health, op. cit., p. 133.

<sup>11</sup>Hampton, "Development of the National Maritime Quarantine System," op. cit.

(20 Statute 37) stipulated that rules and regulations for the enforcement of the law by the Marine Hospital Service must not conflict in any way with state or municipal authorities.<sup>12</sup>

The scope of activities was greatly widened by Congressional acts becoming important about the latter part of the nineteenth century. In 1878 Congress permitted the Marine Hospital Service to co-operate with state and local authorities in the control of contagious diseases and in the introduction of infectious sources. By 1890 the following were specifically designated by the Service as being quarantinable: cholera, yellow fever, smallpox, and plague. In 1893 power was granted over all contagious and infectious diseases. Commissioned members of the Service were given United States Army rankings comparable to those in the Medical Division of the Army. That became effective in 1889. In 1902 and again in 1917 an executive order stated that in times of threatened or actual warfare, the Public Health and Marine Hospital Service would become an active unit in the military forces of the Army. Also in 1902 the Service prefixed the title, United States. The year 1912 marks the official date for the birth of the United States Public Health Service.<sup>13</sup> The Bureau operated as a part of the Department of the Treasury from its birth until 1939 when it was transferred to the Federal Security Agency. This became effective June 8, 1939.<sup>14</sup>

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<sup>12</sup>Tobey, Public Health Administration, New York, The Commonwealth Foundation, 1939, p. 61.

<sup>13</sup>Brock C. Hampton, "The Public Health Service Leaves the Treasury Department," op. cit.; and Tobey, Public Health Administration, op. cit., p. 62.

<sup>14</sup>Hampton, "The Public Health Service Leaves the Treasury Department," op. cit.

Public health functions originated with contagious and quarantinable diseases. It was a natural and logical development that the related sciences became part of its growth. Informed public opinion, changing concepts of governmental duties, research and federal aid have all contributed to modern public health ideologies.

Federal aid took place in the form of Congressional appropriations permitting the construction of the Hygienic Laboratory, 1901. This act legalized the investigation of contagious and infectious diseases. It was one of the chief activities of the Laboratory. The creation of the Division of Venereal Diseases (1918) was accompanied by sufficient funds to establish and maintain adequate measures in federal, state, and local sections for the prevention, treatment, and control of venereal diseases (1938). A fund was created to provide through the Public Health Service hospitalization for sick and disabled World War veterans (1919).

A National Leprosarium was established at Carville, Louisiana, in 1917. Congress appropriated \$250,000 for the construction of the hospital. The purpose was to treat all lepers in the United States free of cost. The choice of location was difficult because any community where the building would be located felt a terrible disgrace and degradation. However, since 1894, leprosy had been endemic in Louisiana due to its tropical contacts. The state had maintained its own institution at Therville, and was deeply resentful of any interference from the Federal government. But obstacles were eventually overcome and the site chosen was at Carville. It represents one of the best

equipped institutions in the world.<sup>15</sup>

At the same time two hospitals were built for narcotic addicts; one at Lexington, Kentucky, the other at Fort Worth, Texas. In 1930 an institution for defective delinquents was opened in Springfield, Missouri. Medical care for the federal prisoners was under the supervision of the United States Public Health Service.<sup>16</sup>

Supervision for the sale of viruses, serums, toxins, and analogous products while in interstate transit was relegated to the United States Public Health Service in 1902. Research studies included the study and investigation of all diseases and conditions influencing their propagation, including sanitation, sewage, and pollution of navigable streams and lakes in the United States.<sup>17</sup>

Recent legislature concerning this subject has been included in the Social Security Act, Title VI: August 14, 1935; wherein authority was granted for an annual appropriation not to exceed \$8,000,000 for the purpose of assisting state and local authorities in the maintenance of adequate health services, plus an appropriation not to exceed \$2,000,000 for Public Health Service research activities. August 5, 1937, marked the passage of the National Cancer Act, which established the National Cancer Institute; situated in a sixty-acre tract of land near Bethesda, Maryland, which was donated by Mr. and Mrs. Luke I. Wilson. The building is one of six that comprises the National Insti-

<sup>15</sup>Heisser, An American Doctor's Odyssey, op. cit., chap. xiv.

<sup>16</sup>Hampton, "The Public Health Service Leaves the Treasury Department," op. cit.

<sup>17</sup>Ibid.

tute of Health Foundation. Cancer research is to include an exhaustive study and application of findings to the most effective methods of prevention, diagnosis, and treatment.

Another Venereal Disease Act was included May 24, 1938. It provided an appropriation of three, five, and seven millions of dollars for three successive years, and necessary funds thereafter to execute methods for the prevention, treatment, and control of the disease.<sup>18</sup>

Title VI of the Social Security Act appropriated \$3,800,000 for maternal and child health services to be distributed to state health departments.<sup>19</sup>

The varied fields of activities of the United States Bureau of Public Health Service extends to the following departments, which are legally authorized:

1. Medical and hospital relief to merchant seamen, lepers, narcotic addicts, federal prisoners, officers and employees of the federal government.
2. Foreign quarantine.
3. The prevention of interstate spread of disease. This regulation covered the interstate sale of viruses, serums, toxins, and analogous products. Under the law regulations are issued governing inspections of establishments, examination of their products, issuance of license, and the compliance with adopted standards of purity and potency.<sup>20</sup>
4. Co-operation with states in the control of venereal disease.

<sup>18</sup>Ibid.

<sup>19</sup>Tobey, op. cit., chap. ii.

<sup>20</sup>J. W. Kerr, "Federal Public Health Administration, Its Development and Present Status in the United States," Public Health Report, Vol. 28, No. 3, January 17, 1913, pp. 109-19.

5. Scientific research and investigation in all departments of public health with special emphasis placed upon cancer research.

6. The control of biological products. The interstate clause is based on the fact that Congress may regulate commerce between the states. However wide the field of public health activities may be, it may not usurp the state or local authorities unless their facilities are inadequate or the powers refuse to enforce proper measures. Upon failure of local authorities the President may take measures to enforce sanitary regulations.<sup>21</sup>

In the event of nationwide epidemics, the Public Health Service may assume control. Then when an outbreak of cholera, yellow fever, smallpox, plague, or typhus appears any place in the United States, the President may issue sanitary regulations and preventive measures. To support these emergencies a half million dollar epidemic fund is appropriated annually.<sup>22</sup>

Such measures are taken only upon very dire situations. Ordinarily a federal health officer may not interfere or usurp any state powers unless so invited by the state. But under cases of extreme emergencies they may participate without permission. Such a case arose in California in 1899 when the state refused to recognize the seriousness of the plague. Federal officials quarantined the state in order to protect the health of other states.<sup>23</sup>

7. The collection and publication of statistical reports on public health subjects.

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<sup>21</sup>Ibid.

<sup>22</sup>Ibid.

<sup>23</sup>Milton J. Rosenau, Preventive Medicine and Hygiene, New York, D. Appleton & Co., 1917, Chap. vii, "Some General Considerations."

8. Public health education and information.
9. Co-operation and assistance for state health authorities upon request and in connection with the administration of federal social security funds.<sup>24</sup>

Bureaus of the federal government with important public health functions are the following:

- a) Children's Bureau of the Department of Labor.
- b) Division of Vital Statistics of the Bureau of the Census in the Department of Commerce.
- c) Food and Drug Administration of the Department of Agriculture.
- d) Bureau of Narcotics of the Department of the Treasury.
- e) Food and Drug Administration of the Department of Agriculture, and in the same department the Bureau of Animal Industry.
- f) Office of Indian Affairs in the Department of the Interior, which supervises the health of non-citizen Indians.
- g) Veterans' Administration in which department medical and hospital relief are dispensed to veterans.
- h) Federal Trade Commission, under which false advertising of foods, drugs, and cosmetics are determined.<sup>25</sup>

The Public Health Service is centralized in Washington, D. C. The chief of the department is the Surgeon General of the United States Army; and each division is under the supervision of an assistant Surgeon General. Regional

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<sup>24</sup>Tobey, op. cit., pp. 16-35.

<sup>25</sup>Ibid.

offices are located in the following districts.<sup>26</sup>

- I. New York City, New York.
- II. Washington, D. C., Central Office.
- III. Chicago, Illinois.
- IV. New Orleans, Louisiana.
- V. San Francisco, California.
- VI. San Juan, established in 1940, co-ordinates the health activities of Puerto Rico and the Virgin Islands.

The units are the following: the Division of Personnel and Accounts, Foreign and Insular Quarantine and Immigration which pertains to all matters relating to maritime quarantine and the medical inspection of aliens. Domestic or Interstate Quarantine and Immigration which covers the control of contagious and infectious diseases in interstate traffic. In this division all government buildings are inspected. Also the suppression of plague outbreaks and the control of epidemics of typhoid fever. Another unit is that of Sanitary Reports and Statistics and lastly that of Scientific Research.<sup>27</sup>

It is safe to say that the general pattern of state health departments follows the outline of the federal bureau. State departments derive their powers from the police powers of the state. In spite of the wide diversion among the state health departments, the author has selected Dr. Tobey's classification of state powers for quotation. He lists five general headings which are as follows:

<sup>26</sup>Annual Report of the Surgeon General of the United States Public Health Service for the Fiscal Year Ended June 30, 1940. Washington, D. C., United States Government Printing Office, 1941, p. 5.

<sup>27</sup>Kerr, op. cit., pp. 109-19.

1. Quasi-legislative: the power of the state legislature to pass laws pertaining to the public health and the state board of health.
2. Quasi-judicial: the state board of health may exercise judiciary powers by summoning violators of health laws to appear before it for hearing.
3. Executive and administrative duties which pertain to (a) collection and recording of vital statistics for the state, (b) prevention and control of intrastate spread of communicable diseases, (c) maintenance of public health laboratories, (d) safeguarding water and milk supplies and their environments by means of public health engineering, (e) supervision of food supplies, (f) promotion of maternity, infant, child, and school hygiene, (g) public health nursing, (h) industrial hygiene, (i) licensing of occupations, (j) popular health instruction, (k) supervision of local health administration, (l) miscellaneous duties.

Sections four and five are investigational and educational functions.<sup>28</sup>

Communicable diseases have been mentioned several times in this chapter. Though a general knowledge of communicable disease is common to all, a more technical one is incumbent in the course of the chapter. The control of disease is a fundamental and historical problem. A definition for communicable diseases is the following: "diseases caused by micro-organisms that may be transmitted directly or indirectly from man to man, or from animal to man."<sup>29</sup> Infectious and communicable diseases are synonymous, while contagious diseases are those spread from one to another, from the sick to the well. All con-

<sup>28</sup>Tobey, op. cit., chap. iv, "State Health Organization."

<sup>29</sup>Ibid., p. 129.

tagious and infectious diseases are communicable but many infectious ones are not contagious. The American Public Health Association prepared a list of communicable diseases for which notification to municipal and state health departments is required. A detailed memorandum of data on cause, transmission, control and treatment accompanies each of the forty-four notifiable diseases.<sup>30</sup> The use of sanitary measures is not only important in the prevention of the spread of communicable diseases, but also to prevent their propagation. Those measures also refer to the sanitation of trains, vessels, and aeroplanes; regulations concerning employees of means of common transportation and the exclusion of dangerous and infectious merchandise.<sup>31</sup>

The United States Bureau of Public Health Service has gone very far a-field from its original service of maritime quarantine, but it has in no way neglected its original activity. So great a change has taken place in quarantine procedures that today they are uniform throughout the world. The international sanitary conventions have evolved these five principles.

Obligatory notification between the powers of the occurrence of quarantinable and other epidemic diseases. Quarantine regulations applied only against infected areas.

Preventive measures carried out before the departure of a vessel from an infected port.

Medical inspection of individuals on board during voyage and proper treatment of suspicious cases.

Preventive measures at the port of entry dependent upon conditions in individual cases, such as medical inspection of passengers and crew, and inspection of the vessel, statements in the bill of health, the time elapsed

<sup>30</sup>Ibid., chap. viii, "Control of Communicable Diseases."

<sup>31</sup>Kerr, op. cit.

from the time of departure and time of arrival, the occurrence of quarantinable disease on board or of suspicious cases, and similar conditions.<sup>32</sup>

The first national quarantine stations were established in 1787 at Ship Island, Gulfport, Mississippi, Blackbeard Island, Sapelo Sound, Georgia, and Norfolk, Virginia, at the entrance to Chesapeake Bay. Today the Federal government through the United States Public Health Service operates fifty-two quarantine ports in continental United States; thirty-three stations in territorial and insular possessions; forty-one airports of entry; a station in the Panama Canal Zone, and seventeen border stations. There are forty-one stations in American consulates in foreign countries in connection with immigration activities.<sup>33</sup>

Quarantine activities include medical inspection of vessels, crew, and passengers; aeroplane, crew, and passengers arriving at American ports, and insular possessions; medical examination of immigrants at ports of departure for the United States; medical examination of alien passengers and seamen under the immigration laws; the institution of isolation and detention measures when necessary; and the fumigation of vessels.<sup>34</sup> In this manner the federal government acts to control the entry of disease into the United States from foreign countries by means of supervision of foreign commerce, medical inspection and denial of entry of diseased immigrants.<sup>35</sup>

The dominating principle of modern maritime quarantine is that it acts as

32 Hampton, "Development of the National Maritime Quarantine System," op. cit.

33 Ibid.

34 Ibid.

35 Tobey, op. cit., chap. viii.

a sieve or filter rather than a dam. The object is to destroy, detain, or isolate with the least possible interference to trade or travel. The infected or infectious are retained while the others are permitted to go on.<sup>36</sup>

The following information may not seem to be historical in content, but I believe it necessary in order to give complete data on quarantine activities.

Maritime quarantine is enforced against six diseases only: Cholera, chief attention is paid to the personnel, food and water supply. The ill are isolated, and an appropriate disposal made of the excreta, to prevent the spread of infection. An examination is made of the food and water supply for infection, if positive they are sterilized by cooking or else destroyed. Any-one free of cholera vibrios (germs) is released. Sick, convalescent, and im-mune carriers are detained and isolated until bacteriological examinations show them free of vibrios. Those infected are retained until free of vibrios. The former method had been to detain all contacts for a period of five days. This method did not prevent the admission of carriers and placed needless restraint upon the uninfected. The incubation period covers five days from the last exposure.

The incubation period for yellow fever lasts from five to six days. The ill are isolated under screening. The contacts, if well, are released upon the sixth day after the positive bite by a stegomyia mosquito.

A detention period of seven days is required in bubonic plague. Preven-tion of the disease demands the extermination of rats and fleas. Little dan-ger is encountered in the danger of spread of the plague, but such alarm is

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<sup>36</sup>Rosenau, op. cit., chap. vii.

experienced among man by reports of the disease that those infected are detained at quarantine.

The incubation period for typhus fever is twelve days. Those infected and having contact with the disease are detained and treated for the destruction of lice found upon their bodies and personal effects.

The required detention period for smallpox and contacts is fourteen days. While those afflicted with leprosy are not admitted to the United States.<sup>37</sup>

The quarantine is under strict supervision of the officer in charge of the station. No communication with persons boarding, or those leaving the vessel is accomplished without permission. Nothing is allowed to be taken on, ashore, or thrown overboard without permission. Restrictions apply to all persons, food, and merchandise. If a ship is under surveillance it may be fumigated, furnished with a fresh crew and dismissed, but those who were on board are detained at the station.

Each of the United States quarantine stations is equipped with facilities for boarding and inspection of the vessel and personnel. Equipment consists of mechanical apparatus for cleansing the boat and appliances of steam, sulphur, formaldehyde, cyanide gas, and other solutions. Each station is provided with a clinical laboratory, a hospital for the internment of contagious and doubtful cases. A comfortable service is provided for suspects. Careful supervision is given to the water supply and sewage disposal and not in the least of important features is the steam laundry with which each station is supplied.<sup>38</sup>

<sup>37</sup>A Half Century of Public Health, op. cit., pp. 119-32.

<sup>38</sup>Ibid.

All vessels arriving in the United States from a foreign port are in quarantine until given a free practique. A practique is a permit to enter the port given to the master by the quarantine officer. It is presented to the collector of the port if it is permitted entrance. The inspection of the ship is largely governed by the ports from which the vessel has sailed.

The United States Bill of Health is a document issued by the American consul at the port of departure to the ship's master. It contains a history of the quarantinable diseases of the port for the two weeks preceding its departure. A complete description of personnel, and apertures, of the vessel, including its sanitary history. The master receives a duplicate copy of the Bill while the customs collector at the point of entry receives the original. A vessel is subject to a \$5,000 fine if it arrives without an official Bill of Health.

The American Bill of Health is the only one of value upon its arrival at a port of the United States. To cite an example, a British vessel may clear from Rio de Janeiro with its destination New York. It must carry three clearances, one from England, another from Brazil, and the third from the American consul. The last is the only one of service upon reaching its destination at New York.<sup>39</sup>

Surveillance is practiced in maintaining quarantine control over aircraft passengers from foreign ports. Such surveillance is necessary because of the rapidity of air travel. Persons from epidemic areas throughout the world could bring infections to any United States community before the appearance of

<sup>39</sup>Rosenau, op. cit., pp. 378-82.

any recognizable symptoms.<sup>40</sup>

A major problem in air transportation to the United States Public Health Service has been the destruction of insects, principally mosquitoes on aircraft from foreign ports.

Three specific objectives concerning aircraft are:

1. To prevent the introduction of yellow fever infected mosquitoes from South American ports.

2. To prevent the introduction of Anopheles gambiae from eastern South America into southern United States.

3. To prevent the introduction of any Anopheles from the west coast of the United States into the Hawaiian Islands.<sup>41</sup>

The vigilance of the United States Public Health Service at ports of entry, through the notification of local health authorities at the destination of the traveler permits immediate use of preventive measures against the spread of possible infections. The most recent development in giving every possible assistance in rapid quarantine clearance is that of radio pratique.<sup>42</sup>

Radio pratique was introduced at the port of New York February 1, 1937, by Dr. Charles V. Akin--who was at that time Chief Quarantine Officer of the port. Its purpose was facilitation of vessels ordinarily subject to quarantine inspection. The pratique permitted a vessel with satisfactory sanitary and health status to dock at certain ports without stopping for the customary

<sup>40</sup>John J. Sippy, M.D., "Effective Quarantine Surveillance," Public Health Report, Vol. 55, No. 18, May 3, 1940.

<sup>41</sup>C. L. Williams, "Disinsectization of Aircraft," Public Health Report, Vol. 55, No. 23, June 7, 1940.

<sup>42</sup>Sippy, op. cit.

quarantine inspection. In order to accomplish this the vessel must employ a full time physician, satisfactory sanitary conditions, be relatively rat-free, must carry no commercial shipments of psittacine birds, and in service between certain specified ports not infected with quarantinable diseases. Before arrival the ship's physician radios to the port official concerning satisfactory conditions on board, not more than 24 nor less than 12 hours before arrival.

Radio pratique is at present in use in several United States ports. A ship may become ineligible through not performing all duties required. The ports are those with passenger vessels in regular service, such as New York and certain European ports. Eastern and Western coasts of the United States through Panama, New York and Panama; New York and Bermuda, or other ports in the West Indies.

In view of disordered world conditions more stringent methods may be needed in the future. In the balance of public health, prevention still outweighs cure, with respect to the introduction of disease from abroad as well as to the control of disease within our borders.<sup>43</sup>

The current problem of the United States Public Health Service is the care, protection, and preventive measures applied to the men being inducted into military defense programs and the accompanying industrial army of workers supporting the National Defense Program.

The gathering of large bodies of men for military training presents a grave problem in preventive medicine. Past experience has proven the fact

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<sup>43</sup>Charles V. Akin, "Radio Pratique at the Port of New York," Public Health Report, Vol. 56, No. 25, June 26, 1941.

that the rapid development of a large armed force is accompanied by disease. Even though the most efficient and scientific methods were employed in World War I, the death rate from contagious diseases in the United States Army was higher than the mortality of actual warfare.<sup>44</sup> Extensive plans have been made to prevent the spread of disease within the active forces and in civilian areas adjacent to training camps.<sup>44</sup>

As the nation grew in population, area, wealth, and modernity, so the United States Bureau of Public Health accompanied the development. It is in existence one hundred and forty years. From a modest maritime service contributing to the health of our country in a small way it has grown to a complex bureau of federal activity. The Service represents the acme of scientific development and performs a tremendous benefit to all Americans.

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<sup>44</sup>"Advance Attack on Wartime Plagues, Immunization against Infectious Disease in the United States Army," What's New, April, 1941, North Chicago, Illinois, Abbott Laboratories.

## CHAPTER IV

### THE RELATION OF THE UNITED STATES TO INTERNATIONAL PUBLIC HEALTH WORK

Seven years before the turn of the twentieth century an agreement had been reached between several governments to control the spread of disease, principally that of cholera and plague. This movement had been in progress for forty years, but was not able to co-ordinate its actions until 1907 when an international congress meeting in Rome gave birth to the idea of an International Public Health Office. Realization of this movement took place the following year with headquarters located in Paris. So the year 1908 marks the birth of an International Board of Health. Today, Pan-American Relations, The Rockefeller Foundation International Health Board, the International Public Health Office, the League of Nations Health Organization, and the United States Public Health Service all co-operate and unite their efforts in eradicating as much as possible the social, civil, and moral evils deriving from unhealthful and unsanitary means of living.

The United States was faced with the problem of Oriental and tropical health problems with the acquisition of the Philippine Islands and Cuba, and the construction of the Panama Canal. During the Spanish-American War while American troops were stationed in Cuba, over 50 per cent of our armed forces were attacked with fever.

The Walter Reed Commission was sent to the island to study yellow fever.

Only one member of the commission was immune to the disease; Doctor Aristedes Agramonte, a native Cuban, and bacteriologist, was appointed by the United States Army, and was the only member immune to yellow fever. Drs. Reed and Carroll were army surgeons, while Dr. Jesse Lazear was a bacteriologist from Johns Hopkins Hospital. The theory of the disease has been discussed in Chapter I, and the Walter Reed Commission corroborated those findings.

Chief Reed was familiar with Dr. Finlay's discovery of the source of infection. Facilitation of further proof of Finlay's anopheles mosquito theory was aided by members of the committee submitting to the insect bite test. A complete record was kept of the health of every man submitting to the experimentation. Dr. Carroll was infected and though he survived yellow fever, he never recovered from the effects of the disease. He died prematurely with a heart condition caused by the inoculation.

Dr. Lazear was similarly injected but did not become ill and believed himself immune. While he was collecting blood from a fever patient he was severely bitten by a mosquito but was not alarmed believing in his immunity. Within a few days he succumbed to the disease. Lazear's untimely death, at the age of thirty-four, brought to light the realization that there were many flaws in the experimentation being conducted.

Dr. Lazear's death occurring September 25, 1900, earned him recognition as a martyr to science. His memory is honored by a memorial tablet erected at Johns Hopkins Hospital bearing the following inscription:

With more than the courage and devotion of the soldier, he risked and lost his life to show how a fearful pestilence

is communicated and how its ravages may be prevented.<sup>1</sup>

Reed established an isolation station, Camp Lazear, wherein strict quarantine was practiced among patients and doctors. John R. Kissinger and John J. Moran, privates from Ohio, answered the call for volunteers. Both were inoculated with the disease. Moran was not affected but Kissinger developed a typical case, from which he recovered.

Following the theory that yellow fever could be spread in a manner similar to that of plague, i.e., from infected clothing and bedding, further experimentation included the construction of a small wooden one-room building about a mile from Camp Lazear, heavily screened and shuttered in order to prevent ventilation.<sup>2</sup> A quantity of soiled bedding contaminated by all sorts of yellow fever patients was placed in the cabin. Three volunteers slept for twenty successive nights upon the soiled clothing, but none became infected: thus another fallacy was exploded.<sup>3</sup>

Private Moran, previously inoculated, furnished the next exhibit by permitting a swarm of infected mosquitoes to bite him. He developed yellow fever but recovered within a few days. So the Yellow Fever Commission conclusively proved that the disease is acquired by the bite of a stegomyia mosquito and that prevention lay in the destruction of the insect. Of the fourteen sub-

<sup>1</sup>The Pit-Mor., January, Vol. VI, No. 3 (May and June, 1941). Pittman Moore Company, Indianapolis, Indiana. Pamphlet sent out by above company to members of the medical profession.

<sup>2</sup>U. S. Congress, Senate, Yellow Fever. A Compilation of Various Publications, Results of the Work of Major General Walter Reed, Medical Corps, United States Army, and the Yellow Fever Commission. Presented by Mr. Owen, January 27, 1911. Referred to Committee on Printing. 61st Congress, 3d Session, Document No. 822, p. 11. Washington, Government Printing Office, 1911.

<sup>3</sup>Ibid., p. 10.

mitting to this test eight were American soldiers.<sup>4</sup> Within a ninety-day period Havana was freed from yellow fever and within a single year not a single case existed on the Island of Cuba.<sup>5</sup> It is doubtful that this success would have been attained without the co-operation and support of Military Governor Leonard Wood and Major William C. Gorgas of the United States Army Medical Corps.<sup>6</sup>

When the United States began the construction of the Panama Canal, Dr. William C. Gorgas, United States Medical officer, was assigned the gigantic task of ridding Panama of the stegomyia insect.<sup>7</sup> Gorgas was handicapped by the fact that he was not appointed to the canal commission; the American Medical Association worked for his appointment but the army refused on the grounds that the canal construction was an engineering rather than a scientific problem.

Gorgas was confronted with governmental interference and a lack of sufficient supplies. Secretary of War Taft, upon his inspection of the Canal Zone, intended to secure the removal of Gorgas, but Dr. Reed made a similar inspection for the American Medical Association and found conditions very complimentary to the officer in charge. Another, Dr. Alexander Lambert, personal friend of President Theodore Roosevelt, also favored Gorgas' accomplish-

<sup>4</sup>Ibid., p. 23.

<sup>5</sup>Ibid., p. 26.

<sup>6</sup>Victor Heiser, M.D., An American Doctor's Odyssey, op. cit., chap. iii, "The Promised Land."

<sup>7</sup>Fielding H. Garrison, A.B., M.D., An Introduction to the History of Medicine; With Medical Chronology; Suggestions for Study and Bibliographical Data, Philadelphia, W. B. Saunders Company, 1929, 4th edition, revised and enlarged, p. 719.

ment. In five years only nineteen Americans died of yellow fever on the isthmus.<sup>8</sup> In recognition of his splendid work Dr. Gorgas was appointed Surgeon General of the United States Army (1917).<sup>9</sup>

Today American troops stationed in Panama, in Puerto Rico, in the Caribbean area, and at other tropical bases are vaccinated against yellow fever. The vaccine was developed in the Rockefeller Foundation's International Health Division laboratories and is distributed through the United States Public Health Service. It is one of the few vaccines that can be used successfully in the face of an epidemic.<sup>10</sup>

Proximity of the Philippine Islands to the Orient produced similar disease centers. One of the tasks of the United States in her new guardianship was to promote health and sanitation on the Islands. Plague, cholera, smallpox, tuberculosis, beri-beri (form of paralysis) and leprosy were the most serious diseases to be controlled.

Sanitation was the most primitive; superstition and suspicion were uppermost in the minds of the natives; a low economic standard of living and lack of understanding of nutrition all contributed to the high death rate and disease susceptibility of the Filipino. The Army Board of Health operating as a civilian and military unit subject to the Governor General of the Islands began the gigantic task of improving general conditions.

<sup>8</sup>Bassett, A Short History of the United States, Vol. III, 1805-1929, New York, The Macmillan Company, 1929, p. 821.

<sup>9</sup>Ralph H. Major, Disease and Destiny, New York, D. Appleton and Company, Inc., 1936, chap. viii, "Yellow Jack."

<sup>10</sup>General Electric, "Troops in Tropics Vaccinated against Dread Yellow Jack," X-Ray Corporation Victor News, Vol. XIII, No. 3, March, 1941. Published by G. M. X-Ray Corporation, Chicago, Illinois.

Bubonic plague was fought by scientific engineering. Wharves were rat-proofed; an intensive drive to control the rodent population of the islands ensued; strict quarantine and periodic fumigation of all vessels docking in Manila to prevent any spread of the plague and control of infested ships were all methods taken to insure safety against the dreaded plague.<sup>11</sup>

Water purification and vaccination aided in the control of cholera and smallpox.

Dairy products in the early part of the twentieth century were neither available or known to the native. The female water buffalo (caroballa) furnished the natives almost exclusively with their milk supply. Even this was limited as the animal was subject to the rinderpest disease, a form of cattle dysentery 90 per cent fatal.<sup>12</sup> This dietary problem made the natives very susceptible to tuberculosis.

In 1905 a leper colony was organized on the Island of Culion, one of the Calameanes group, between Sulu and the China Sea. Father Valles, S.J., and four nuns of the Order of Sisters of St. Paul de Chartres were placed in charge of the colony.<sup>13</sup>

Dr. Heiser was an energetic worker for all health and sanitary reforms in the Philippine Islands. He spent approximately ten years there as a health official and presents a thorough picture of conditions in the East.

The following is a synopsis of the Territorial Health Service. In Hawaii an appointed Board of Health composed of four laymen and two physicians

<sup>11</sup>Heiser, op. cit., chap. vii, "The Black Death."

<sup>12</sup>Ibid., chap. xiii.

<sup>13</sup>Ibid., chap. xiv.

acts with the Attorney General who is a member ex-officio. The resident governor appoints the president of the Board. Their term of office runs for four years.

The Board controls sanitation, water pollution, sewage disposal, milk supplies, food adulteration, nuisances, communicable diseases, and quarantine. Each county and city has the power to enforce all sanitary measures and control of quarantine within their districts. The general medical officer is in charge of all communicable diseases and their subsequent reports. Smallpox vaccination of all children on the island is compulsory.

Instruction and advantageous publicity concerning health issues are reported upon by the various heads of the health department through local news agencies. The board also issues a weekly bulletin on reported communicable diseases and a monthly report on morbidity and mortality rates.

Departments of the Health Department are the following:

- Bureau of Tuberculosis
- Bureau of Vital Statistics
- Bacteriological Laboratory
- Bureau of Sanitation
- Bureau of Maternity and Infancy
- Medical Inspection of Schools
- Bureau of Pure Foods and Drugs
- Bureau of Leprosy (non-leprosus children  
born to lepers are cared for in two  
special homes in Honolulu, financed  
and managed by the Board of Health)
- Territorial Hospitals for the Insane

An insular board of health functions in Puerto Rico. It also is composed of seven members; an engineer, attorney, chemist or pharmacist, and four recognized physicians, licensed practitioners of the island, with at

least five years' resident experience. The term of office of this board is unlimited. The Commissioner of Health is appointed by the governor and must be a physician outside of the insular board of health. Here public health work is centralized, it being the duty of the board to prescribe sanitary regulations and ordinances applicable to all the municipalities of the Island with the intention of suppressing and preventing contagious and epidemic diseases.

Departments of the Puerto Rico Board of Health are:

- Bureau of Municipal Health Work
- Bureau of Transmissible Diseases
- Bureau of Control and Suppression of Tuberculosis
- Bureau for the Prevention and Control of Venereal Diseases
- Bureau for the Suppression of Unicancariasis (hookworm)
- Bureau of Mosquito Extermination and Control
- Bureau of Suppression of Malaria
- Bureau of Vital Statistics
- Bureau of Laboratories
- Bureau of Sanitary Engineering
- Bureau of Social Welfare
- Bureau of Food and Drugs

In the District of Columbia health is administered by a Board of Commissioners appointed by the President of the United States and confirmed by the Senate. A physician is appointed as chief health officer. This central health service consists of the chief health officer, assistant, and deputy health officers, plus seven clerks and two messengers. The department is not civil service.

Divisions of the Washington health service are:

Bureau of Preventable Diseases  
Bacteriological, Serological, Chemical  
Laboratories  
Tuberculosis Clinic  
Venereal Disease Dispensary  
Bureau of Vital Statistics  
Bureau of Sanitary Inspection  
Eight Hour Female Labor Law  
Bureau of Child Hygiene and Welfare  
Bureau of Medical and Sanitary In-  
spection of Schools  
Bureau of Dairy, Food, and Drugs<sup>14</sup>

After the acquisition of the Virgin Islands a medical officer was instructed to report to the governor of St. Thomas Island on July 24, 1917, for duty as a quarantine officer. National quarantine laws and regulations became effective on the islands September 27, 1917.<sup>15</sup>

Quarantine regulations and restrictions have been discussed in previous chapters, but I have included stations not a part of continental United States in this section because their locations are those beyond our borders.

Insular quarantine stations are located in the following ports; those marked with asterisks indicate that health officers are also in charge of the medical inspection of aliens seeking admission to the United States.

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<sup>14</sup>Treasury Department, Public Health Service, "Health Departments of States and Provinces of the United States and Canada," Public Health Bulletin, No. 184 (revised, April, 1932). Part IV, Summaries: Territorial Health Services by Territories. Compiled by John A. Ferrell, M.D., Dr. P. H.; Wilson G. Smilie, M.D., Dr. P. H.; Platt W. Covington, M.C., C.P.H.; Pauline A. Mead, B.Sci. in Hyg.; International Health Division of the Rockefeller Foundation for the Conference of State and Provincial Health Authorities of North America. Washington, Government Printing Office, 1932.

<sup>15</sup>James A. Tobey, National Government and Public Health, The Institute for Government Research Studies in Administration, Baltimore, Maryland, The Johns Hopkins Press, 1926, p. 109.

Territory of Alaska: Ports      Cordova\*  
                                       Juneau\*  
                                       Ketchikan\*  
                                       Seward\*  
                                       Sitka\*  
                                       Wrangell\*

Hawaii:                            Ports      Honolulu\*  
                                       Ahukini  
                                       Hilo  
                                       Kahului  
                                       Lahaina  
                                       Mahukona  
                                       Port Allen

Philippine Islands: Ports      Manila  
                                       Cavite  
                                       Cebu  
                                       Davao  
                                       Iloilo  
                                       Jolo  
                                       Legaspi  
                                       Alongapa  
                                       Zamboanga

Puerto Rico:                     Ports      San Juan\*  
                                       Aquadillo  
                                       Arecibo  
                                       Arroyo  
                                       Central Aquirre  
                                       Fajardo  
                                       Guanico  
                                       Humacao  
                                       Mayaguez  
                                       Ponce

The supervision of all stations in Puerto Rico and the Virgin Islands is in charge of the chief quarantine officer at San Juan, Puerto Rico.

Virgin Islands:                   Ports      Charlotte Amalie\*  
                                       Christiansted\*  
                                       Frederiksted\*  
                                       St. John\*

Panama Canal Zone:                 Balboa Heights

Quarantine officers are assigned to the following consulates. Number fifteen indicates medical examination of applicants for visas through the consular immigration service. Sixteen refers to stations where the examination of aliens bound for the United States goes through the Immigration Service.

<u>Country</u>	<u>Province</u>	<u>Station</u>
Canada	New Brunswick	McAdam 15 and 16 St. John 15-16
	Quebec	Montreal 15-16 Quebec 15-16
	Ontario	Toronto 15-16 Windsor 15-16
	British Columbia	Vancouver 15-16 Victoria 15-16 Winnipeg 15-16 Yarmouth 15-16 Niagara Falls 15-16
		<u>Station</u>
China		Amoy Hong Kong Shanghai
Cuba		Habana 15
Netherlands		Guantanamo Amsterdam 15 Rotterdam 15
Belgium		Antwerp 15
Greece		Athens
Ireland		Belfast
Irish Free State		Dublin 15
Germany		Berlin 15 Stuttgart 15 Hamburg 15 Vienna 15 Konigsberg 15
England		London 15
Italy		Naples 15
France		Paris 15
Norway		Copenhagen 15 Oslo

<u>Country</u>	<u>Station</u>
Scotland	Glasgow 15
Sweden	Goteborg 15
	Stockholm 15
U.S.S.R.	Moscow
Mexico	Mexico City, F.D. <sup>14</sup>
	Tampico
South America	Guayaquil
	Ecuador <sup>16</sup>

In addition to the stations mentioned every important consulate has a health officer assigned. The Division of Foreign and Insular Quarantine observe the standardized international codes adopted by the Pan-American Sanitary Bureau, the International Sanitary Convention of Paris which met in 1926, and the International Sanitary Convention for Aerial Navigation in order to prevent the introduction of contagious and infectious diseases into ports of the United States.<sup>17</sup>

Standardization of sanitary codes was instituted by the United States when President Hayes called a conference on International Sanitation to meet in Washington, January, 1881. The object of the meeting was to adopt uniform sanitary and quarantine regulations; also to determine the actual hygienic conditions of ports, vessels sailing therefrom, and a codified system of international notification of those conditions. The governments represented were: Germany, Austria-Hungary, the Netherlands, Belgium, Spain, Portugal,

<sup>16</sup>M. C. Guthrie, "Official List of Commissioned and Other Officers of the United States Public Health Service, January 1, 1941," Federal Security Agency: Public Health Service Miscellaneous Publication, No. 11, pp. 46-54. Washington, Government Printing Office, 1941.

<sup>17</sup>Anne Morris Boyd, United States Government Publications; Sources of Information for Libraries, New York, The H. W. Wilson Company, 1941, p. 398.

Number of cases of:

Yellow fever \_\_\_\_\_

Asiatic cholera \_\_\_\_\_

Plague \_\_\_\_\_

Smallpox \_\_\_\_\_

Typhus fever \_\_\_\_\_

Number of deaths from:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- c. Population according to the last census
- d. Total deaths from all causes during the preceding month
- 2. Any circumstances concerning the public health existing in the port of departure to be here stated:

I certify that the foregoing statements are made by \_\_\_\_\_ who has personally inspected said vessel; that I am satisfied that the said statements are correct; and I do further certify that the said vessel leaves this port, bound for (name of port), in (country).

In witness whereof I hereunto set my hand and the seal of office, at the port of \_\_\_\_\_, this \_\_\_\_\_ day of \_\_\_\_\_ year \_\_\_\_\_ time.

Seal

Signature \_\_\_\_\_

22

All the merchant ships and vessels sailing from a foreign port to the United States must carry such a bill of health from the port of departure. It may be signed by the consul, vice-consul, or consular medical officer assigned to the particular port. If the vessel does not make a continuous voyage it must also receive from the American officer in each port visited a bill of health indicating sanitary and health conditions of each port.<sup>23</sup>

Pan-American relations with the United States have received genuine stimulus through the co-operation of the countries in promoting general improvement in health, hygiene, and sanitation. Any social and philosophic association of countries serves to promote political solidification. Even though Pan-Americans are not always receptive to the promotion of plans worked

<sup>22</sup>Ibid., p. 62.

<sup>23</sup>Ibid., p. 65.

out in the United States, still our international relations have been strengthened through the Pan-American Sanitary Bureau.

The first International Conference of American States met in Washington, D. C., in 1899. The chief problem concerning this meeting was the control of the quarantinable diseases of bubonic plague, cholera, typhus fever, smallpox, and yellow fever. In 1901 the second conference was held in Mexico City, and voted upon the meetings to be a permanent institution operating as the International Sanitary Bureau with headquarters in Washington, D.C. Further was the authorization of the first meeting of the International Sanitary Conference under the auspices of the International Union of American Republics; it took place in Washington, December 2, 3, 4, 1901.

In Santiago, Chile, 1923, the name of the group was shortened to the Pan-American Sanitary Conferences and Pan-American Sanitary Bureau. The original purpose is, of course, adhered to and many others have been added. Chief among them was a plan for expedition of commerce, cargo, and passengers subject to quarantine regulations, in order to avoid delays, inconvenience, expense, and commercial loss accrued through the execution of safety measures, but still to safeguard public health. In order to achieve this a sanitary code was adopted.

At the sixth conference it was agreed to publish a monthly bulletin relative to sanitation and public health, particularly emphasizing the prevention of the occurrence and spread of communicable diseases. Now the bulletins are issued weekly. The International Office of Public Health in Paris

receives the Pan-American Sanitary Bulletins and any other interested country may apply for them.<sup>24</sup>

Beginning in 1926 and meeting every five years, directors of the national departments of health in the American republics confer in Washington, D. C., under the auspices of the Pan-American Sanitary Bureau. Proceedings of these sessions are published in the Pan-American Sanitary Bulletin.

The following republics are members of the organization: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, United States of America, Uruguay, and Venezuela. Finances are provided through a 21 1/2 cent tax per 1,000 population.

In the annual report of Director Surgeon General Hugh S. Cummings for the Bureau in the year 1937-38 he said: "The spirit of friendship and co-operation has made it possible for the Pan-American Sanitary Bureau to perform its mission as co-ordinating agency for international public health in the Western Hemisphere, and gradually but effectively extend the scope of its work."<sup>25</sup>

Today officers of the Public Health Service serve with the Pan-American Sanitary Bureau. They act as traveling representatives of the Bureau to the South American republics in need of assistance in matters pertaining to health

<sup>24</sup>Pan-American Sanitary Bureau, Annual Report of the Surgeon-General for the Fiscal Year 1938-1939, Washington, D.C., Government Printing Office, 1940, pp. 8-9.

<sup>25</sup>Pan-American Sanitary Bureau, Annual Report of the Director, Surgeon-General H. S. Cummings (retired), Fiscal Year 1936-1937, Washington, D.C., United States Government Printing Office, 1938, pp. 10-12.

administration and organization, and other relative problems.

At the fourth Pan-American Conference of National Directors of Health, held in Washington, D.C., from April 30 to May 8, 1940, a profitable interchange of opinions regarding health problems took place.

Thomas Parran, Surgeon-General of the Public Health Service, served as chairman of the section on Medicine and Public Health, at the eighth American scientific Congress meeting in Washington, D.C., May 10-18, 1940. During this conference the State Department and the Interdepartmental Committee on Cooperation with the American Republics invited the Public Health Service to participate in the activities of the Joint Committee on Medicine and Allied Sciences for the promotion of cultural relations with the American Republics. It was said that the Pan-American Bureau and Public Health Service through their united efforts did the most to promote good will throughout the Americas.

Further cementing of these ties has been extended through internships in marine hospitals for seven medical students from Chile and Ecuador. The plan for more medical and dental internships is to be extended to Brazil, Colombia, Cuba, Guatemala, and Honduras.<sup>26</sup>

World health covers a multitude of subjects, people, and places. To improve the health of the world is a stupendous task. To say that a definite improvement in the health of the world has been accomplished by a single organization would give voice to a very controversial subject. Growing world

<sup>26</sup>Annual Report of the Surgeon-General of the Public Health Service of the United States for the Fiscal Year 1940-1941, Washington, D.C., Government Printing Office, pp. 30-35.

conflicts bring with them accompanying detriment to health and standards in general. But I believe a definite aid to health has been the standardization of cause and treatment of many of the epidemiological diseases. Two organizations have been leaders in the promotion of improvement in health standards: the Health Division of the League of Nations and the International Health Board of the Rockefeller Foundation. They are in order for discussion in a topic relating to United States public health services because of our association with the former and though the Rockefeller Foundation is international in the scope of its activities, it is a truly American philanthropic institution.

Articles 23(f) of the Covenant established the Health Organization of the League of Nations. Three departments are: a General Advisory Health Council; a Standing Health Committee, and a Permanent Secretariat. The Health Council co-ordinates its work with the Paris International Public Health Office and the two are aided by the International Health Board. Its activities were begun in 1923 and though curtailed by world conditions today, are still in operation. Membership in the League is not a requisite for membership in the Health Organization.<sup>27</sup>

The Health Committee is composed of twelve members who are specialists in medicine, hygiene, and public health. They are appointed for a three year period and are not necessarily representatives of their respective governments, or from states with League membership. The United States has always had

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<sup>27</sup> Information Section, League of Nations, "League of Nations Questions 12," World Health and the League, 1939, Geneva, League of Nations, Publications Department.

representatives on this Committee and Germany was permitted representation before admission to the League.<sup>28</sup> The Health Committee co-operates with the International Labour Office, and the Opium Advisory Committee. Its two major divisions are:

1. Preliminary emergency work of the Epidemic Commission (against the post-war epidemics of eastern Europe), 1920-23.
2. Building up the Health Organization of the League of Nations under which falls the work of
  - a) Epidemic control
  - b) The mutual education of nations in ways of promoting health (interchange of health officers).
  - c) Advice and help to China, Greece, and other nations who have asked the League's aid in building up a new health administration
  - d) The control of the traffic in opium, cocaine and other narcotics. (This is not under the Health Organization but under a separate division of the League's activities.)
  - e) Anti-malaria campaigns
  - f) Syphilis
  - g) Other diseases
  - h) Standardization of drugs, sera, etc.<sup>29</sup>

The Health Section is the executive department of the Health Organization and an integral part of the League's Secretariat. It collects requisite information, makes conference preparation, arranges study tours, and directs the correspondence and publication of health material.<sup>30</sup>

Singapore was chosen as the Eastern Health Bureau because of its proximity to cholera, smallpox, and plague regions. A wireless station was erected

<sup>28</sup>Victor M. Heiser, M.D., Millions of Patients, What the League Is Doing for the World's Health. The League of Nations Association, Midwest Office, 75 East Wacker Drive, Chicago, Illinois, January, 1937. P. 5.

<sup>29</sup>Richard C. Cabot, M.D., The United States and the League. International Health Series, No. 1. New York, Educational Committee of the League of Nations, 6 East 39th Street, February, 1931; revised edition.

<sup>30</sup>"League of Nations Question 12," op. cit.

there in 1925 in order to broadcast health conditions. From this station are received health reports concerning thirty-five ports in twelve neighboring countries. In 1928 it covered 143 ports in 47 countries. These included the danger areas of the world. Port health officers further substantiate the station's reports. India, China, Japan, the Malay States, the Philippines, Borneo, Australasia, and the east coast of Africa relay health reports to the Singapore Bureau, who in turn transcribes them to Geneva. Likewise the United States and Europe send reports to Geneva. And Geneva in turn sends reports to the world.<sup>31</sup>

These reports are classified by the Service of Epidemiological Intelligence and Public Health Statistics. The prevalence and movement of infectious diseases are analyzed and classified. Reports are published in weekly, bi-monthly and yearly bulletins, multigraph sheets as many times a week as necessary are issued and report major epidemic diseases. These "Weekly Record" reports cover practically the entire civilized world.<sup>32</sup>

The Health Organization has published six International Health Yearbooks. The last one, published in 1932, contained reports of "Public Health Progress in Thirty-four Countries and Colonies in 1929." The volume is divided into twenty-seven standard tables under the general groupings of:

General Demography (i. e., population areas, census, and general movement of centers of density);

Vital statistics (birth and death rates, infant mortality,

<sup>31</sup>Cabot, op. cit.

<sup>32</sup>Frank G. Boudreau, M.D., "Health Work of the League of Nations." Reprinted from the Milbank Memorial Fund Quarterly, Vol. XIII, No. 1 (January, 1935).

causes of death);

Public Health Statistics, and Data on Curative Medicine.

Statistics for 1929 were supplied by the following countries: Australia, Belgium, Bulgaria, Chinese Republic, Czechoslovakia, Denmark, Egypt, Estonia, Finland, France, French Colonies, Germany, Greece, Hungary, Irish Free State, Italian Colonies, Japan, Latvia, Lithuania, Mexico, the Netherlands, New Zealand, Norway, Poland, Spain, Sweden, Switzerland, Turkish Republic, Union of the Soviet Socialist Republics, United Kingdom, England, Ireland, Scotland, and Wales, the United States of America and Yugoslavia.<sup>33</sup>

The value of the exchange health officers is apparent to all. It is also evident that greater progress would be made in progressive countries and in those places afflicted with a specific need. For example, Italy had led the anti-malarial campaign. England had contributed most to industrial medicine, France to vaccination, the United States drive for the elimination of tuberculosis and venereal diseases, Germany's development of health insurance, and Japan's contribution to the solution of dietary problems.<sup>34</sup>

Since 1922, interchange of Public Health personnel, covering twenty-eight fields of separate investigation, have taken place between fifty-two countries, thirteen colonies or protectorates and two mandated territories. The places of exchange are the following:

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<sup>33</sup> League of Nations Health Organization, International Health Yearbook 1930, Vol. IV. Reports (with Vital and Public Health Statistics) on the Public Health Progress of Thirty-four Countries and Colonies in 1929. Series of League of Nations Publications, Official Number C.H. 951. Geneva, December, 1932.

<sup>34</sup> Cabot, op. cit.

Algeria	Gold Coast	Manchuria
Austria	Great Britain	Netherlands
Belgium	Greece	Nigeria
Canada	Guinea (Fr.)	Norway
Cuba	Guinea (Portuguese)	Senegal
Czechoslovakia	Hungary	Sierra Leone
Dahomey	India	Spain
Danzig	Italy	Sudan
Denmark	Ivory Coast	Sweden
Egypt	Japan	Switzerland
France	Jugoslavia	Togoland
Gambia	Korea	United States of America
Germany	Latvia	

The number of participants in the interchanges of public health personnel equal 489; from 52 countries, 13 colonies or protectorates, and 2 mandated territories.<sup>35</sup>

I believe the following quotation expresses an appreciative review of the contribution to world health by the League.

The steady work of nearly twenty years has gone to create a strong network of effort to assist humanity in improving the condition of nearly every phase of its daily life. The fight against disease, the development of knowledge of the factors which make for physical and mental fitness, have welded a strong body of scientific and lay opinion in a real collaboration and enthusiastic comradeship. The call is not merely to expose and remedy the defects arising from primitive modes of life, but also to provide advanced modernity with the means to guard itself against the new perils of its conquest in the air, on land, and over seas. Here the Health Organization, as the indispensable handmaid to international progress, justifies a firm belief in its mission, now and in the future.<sup>36</sup>

<sup>35</sup>Charles W. Pitkin, The Interchange of Public Health Personnel under the Health Organization of the League of Nations. A Story of the Creation of an International Standard of Public Health Administration, Geneva, League of Nations, Non-Partisan Association, 6 East 39th Street, New York City, Margaret C. Peabody Fund, 1928.

<sup>36</sup>"League of Nations Question 12," op. cit.

The Rockefeller Foundation was incorporated in 1913 under the laws of the State of New York. Its purpose is to promote man's well-being throughout the world. The International Health Division is pertinent to this chapter. Though appropriations are made to other institutions, this division maintains its own laboratories and has a scientific staff operating throughout the world. Though its field of activity is very far-reaching, 75 per cent of its appropriations were used in the United States. These funds were used to substantiate local and state health services, and to stimulate the growth of specialization in such work as epidemiology, statistics, sanitation, nursing, and scientific laboratories.

During 1939 financial aid was given to thirty-seven countries for the promotion of public health services. The money was used in most cases to establish or continue local health services.

To further facilitate this progress fellowships were inaugurated in 1917. During 1940, 120 fellowships were granted in eight branches of public health work. Students represented twenty-eight countries. The fellowships were classified as:

- Public Health Administration
- Public Health Nursing
- Public Health Laboratory
- Sanitary Engineering
- Vital Statistics
- Industrial Hygiene
- Syphilis Control
- Special

The countries receiving these awards were Canada, United States, Brazil, Japan, Philippines, Venezuela, India, Mexico, Panama, Denmark, Argentina,

Chile, Colombia, Cuba, Guatemala, Peru, Sweden, Turkey, Ceylon, China, Costa Rica, Fiji, Finland, Greece, Haiti, Norway, Portugal, and Salvador.

It is true that the European situation has and will curtail activities of this branch of the Foundation. However, a Rockefeller Health Commission, acting under the direction of the International Health Division, is in Europe now studying the handling of the refugee problem, sanitation, post-war epidemics, nutritional deficiencies, and other conditions arising from the war, and constituting major health disasters.<sup>37</sup>

The foregoing data show that the participation of the United States in international public health activities has been extensive, especially in tropical countries where the worst epidemics and plagues are to be looked for. An important reason for this participation was the acquisition of territory and interests in territory subject to endemic tropical plagues. A national desire to co-operate with other nations in sanitary progress was nearly as important and more fundamental. The foregoing pages present the details of this participation.

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<sup>37</sup>The Rockefeller Foundation, Annual Report, 1940, New York, Rockefeller Foundation, 49 West 49th Street, pp. 81-84, 117-30.

## CONCLUSION

Some question may exist as to the historical content of the subject of public health. It is neither conclusively medical or social, but is truly a function of our government. The fact that amendments concerning the subject have not been added to the Constitution need not detract from its historical value. However, it is well to keep in mind Disraeli's advice to statesmen that it should be one of their chief concerns.

Health and warfare are intrinsically related. The American pioneer was confronted with the problem of overcoming disease in order to attain his goal just as is the average citizen of today. The historical background of the public health service is definitely united with the American Navy and received its early name from the Merchant Marine Service. A genuine need for the standardization of all governmental operations has grown from the complexity of design of our present day civilization.

Socialization of history is today popular as well as authentic in trend. Following that idea I have traced the historical growth of public health as a governmental function from its early development through the extensive range of activities covered by it today. There were many ways of treating the subject but I tried to cover the historical and governmental development to the fullest extent. Federal appropriations and the names of executives contributing to the growth of the department were purposely omitted. The former were not essential to the paper and most of the work for promotion of the

Department came through the diligence of those employed in the bureau.

Public health as a function and department of the United States government is of paramount importance to the welfare and well-being of each and every citizen.

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## APPENDIX<sup>1</sup>

Names appearing in Chapter I were not identified with their contributions to science for fear of breaking the trend of thought. Though many have accomplished several feats in the advancement of man's health I have selected the event for which they are best known.

Robert Koch (1843-1910), Klausthal, Hanover, Germany. Proved that anthrax bacillus caused disease. In 1882 he discovered the tubercle bacillus by special culture and staining methods. Löffler and Gaffky were his assistants when he was appointed to the Imperial Health Department, (Kaiserliches Gesundheitsamt) 1180. P. 622.

Friedrich Löffler (1852-1915), Frankfort on the Oder, Germany. Discovered bacteria of erysipelas (1882-83); causal relation of diphtheria bacillus (1884); introduced a preventive inoculation against the foot and mouth disease (1899). P. 626.

Georg Gaffky (1850-1918), Hanover, Germany. Succeeded Koch as director of the Hygienic Institute. He made important studies in septicemia (1881), cholera and anthrax, and is a well-recognized modern authority on infectious diseases and public hygiene. P. 626.

Jean-Antoine Villemin (1827-92), Prey-Vosges Mountains. Proved that tuberculosis is a specific infection due to an invisible, inoculable agent and

<sup>1</sup>Fielding H. Garrison, An Introduction to the History of Medicine. Philadelphia: W. B. Saunders Company, 1924. (3rd edition). The founders of bacteriology were Louis Pasteur (1822-95, Dole [Jura Mountains] France) and Robert Koch. Pasteur was a pioneer in the modern theory of preventive inoculation against disease; Koch developed the correct theory of specific infectious diseases. P. 619.

Girolamo Fracastoro (1484-1553), Verona (?). Medical fame rests on the celebrated medical poems, Syphilis sive Morbus Gallicus (Venice, 1550), summed up contemporary knowledge, dietetic and therapeutic, of the time, recognized a venereal cause and gave the disease its present name. Treatise De Contagione (1546) stated modern theory of contagion and gave first authentic account of typhus fever. P. 227.

James Lind (1716-94), native of Scotland. Founder of naval hygiene in England. Three famous treatises: scurvy (1754); naval hygiene (1757); and tropical medicine (1768). P. 375.

Howard Taylor Ricketts (1870-1910), Finlay, Ohio. Discovered Rocky Mountain fever is transmitted by the wood tick, and, working with R. M. Wilder, that Mexican typhus (tabardillo) is transmitted by the body-louse (Pediculus vestimenti), 1910. P. 742.

Guillaume Dupuytren (1777-1835). Considered ablest and best trained French surgeon of his time. P. 522.

Jean-Louis Alibert (1768-1837), Villefranche de l'Aveyron. Founder of modern French School of dermatology. P. 437.

Franciscus de le Boe or Sylvius (1614-72). One of first to introduce ward instruction in medical education. P. 260.

Edwin Klebs (1834-1913), Konigsberg, Prussia (Germany). Klebs is associated with Pasteur in being a precursor in the bacterial theory of infection. Rush Medical School, Professor of Pathology. P. 625.

Lord Joseph Lister (1827-1912), Upton, Essex, England. Developed anti-septic principle of surgery. P. 633.

Rudolph Virchow (1821-1902), Schievelbein, Pomerania (Germany). Founder of cellular pathology. Known as anatomist, pathologist, epidemiologist, sanitarian, anthropologist and archeologist, editor, teacher, reformer, parliamentarian. P. 613.

Max Schultze (1825-74), Freiburg, Germany. Master worker in histology. Lasting influence on cellular theory; introduced term "protoplasm" and showed it was practically identical in all living cells. P. 561.

Sir Richard Owen (1804-92), Lancaster, England. One of the early workers with the microscope in England. Great contribution was microscopic science; a founder and charter member of the Royal Microscopic Society. P. 473.

Father Athanasius Kircher, S.J. (1602-80), Fulda, Germany. The earliest of the microscopists. P. 250.

William Wood Gerhard (1809-72), Philadelphia, Pennsylvania. Two contributions of enduring value: monograph on tuberculosis meningitis in children (1834) and differential diagnosis of typhoid and typhus fever (1837), which in the United States settled the clinical and pathological status of the two infections. P. 463.