

Thesis.

by

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Quarantine - And its Relations to
the spread of Infectious diseases.

Quarantine - And its Relation to the Spread of Infectious Diseases.

- I - Nature and meaning of Quarantine.
- II - A brief history of Quarantine.
- III - What is meant by Infectious and Contagious diseases.

Causes Spreading Diseases.

- a. Locality.
- b. Damp or Marshy.
- c. Atmosphere.
- d. Food, Water, and Dwellings.

Some important infective diseases.

Modes of Infection and Transmission.

Prevention of transmission of disease.

- a. Quarantine.
- b. Disinfection.

IV - Present regulations of Quarantine.

- a. Marine and Inland.
- b. Complaints against it.

V - Future Quarantine.

Quarantine may be defined as the methods and measures imposed by a government - local - state or national - to prevent the introduction of infectious disease into a country or from one locality to another. The term quarantine may be misleading, being derived from the Italian "quarante," signifying the period of detention as was used by the first Venetian quarantines. It now indicates the entire routine of inspection, disinfection and detention, with-out regard to the length of time involved.

Some measures for the prevention of the spread of infectious diseases can be traced to the mosaics law in the early ages. In the thirteenth and fourteenth chapters of Leviticus we find very stringent measures enforced upon the children of Israel, for the purpose of preventing the spread of Leprosy; and in their journey through Egypt we find them resorting to fumigation to guard against the plague. And when the pestilence broke out among them we saw Aaron taking his censer, filling it with aromatic spices and stand with the burning

incense between the living and dead, and the plague was stayed. Thus we see that the belief of pleasant odors to destroy animal effluvia is quite ancient.

While all civilized nations have recognized the importance of separating those afflicted with epidemic disease from the well, the development of the idea and practice of quarantine has sprung from the growth of commerce that linked together strange countries by a common bond of interest and intercourse. While there has almost always been isolation from leprosy, the first quarantine enactments in our sense of the word, were put in force in the latter part of the fourteenth century, in Venice, the first truly maritime city, as a barrier to the black and Egyptian plagues. Then it was that it first dawned upon the European people that epidemic diseases were transmissible, and from this knowledge sprung our first Board of Health, consisting of three nobles, they called it the Council of Health. Its duty

was to investigate the best means of preserving health and prevent the introduction of disease from abroad, and a lazaretto was established. The laws then established have formed the basis for all similar systems since that time. Bodies dead of the plague were destroyed, and all incoming vessels, passengers, and cargoes coming from suspected places had to undergo a forty-day quarantine before being allowed to enter port and unload their cargoes and passengers.

A few years later the first pest-house was built on a small island near the city and all those arriving from any suspected place, or those sick in the city, were sent there to remain forty days. After 1527 quarantine and lazarettos began to multiply among other nations, and this cumbersome expensive and restrictive system has been in vogue for over four hundred years. In 1720 Marseilles, one of the most noted ports of commerce on the Mediterranean, was placed under a very rigorous quarantine, but

the plague made its appearance in the city and destroyed fifty thousand; however with the increased knowledge and strict quarantine gradually reduced and entirely suppressed by the beginning of the nineteenth century. As disease has spread, quarantine has kept pace with it. The frequent epidemics of cholera and yellow fever, that alarmed the civilized world, and the occasional out-breaks of small-pox and typhus fever has caused the production and rigid enforcement of our present quarantine laws.

The term infections is used to distinguish those maladies which are transmissible through the medium of the air, or by substances of various kinds, without actual contact with the diseased body; while contagion (from con. with, and tangere, to touch) means the more obvious conveyance of the specific virus by direct contact, or by inoculation with the morbid material from the diseased one.

It is a well known fact that certain climates

conditions, aid in the spread of many diseases by being about a constitutional condition, that renders it easy for the production of disease. This condition may be brought about by the locality, and its condition as to moisture, the atmospheric condition, or the food and water they may use.

An animal or plant is moulded according to its environment. If the environments are unfavorable the animal or plant will be predisposed to disease.

Marshy districts are unhealthy for higher animals and the vegetation grown there contains but little nutriment.

Of all things affecting health none are more important than the air we breathe. On it depends the purity of the blood and hence the proper exercise of every function of the body.

Food has an extensive influence on the health of organisms. Improper or insufficient nutriment produces an abnormal condition and hence predisposes to disease.

Of all the many sources liable to spread infectious diseases, none are to be feared more, or easier done than by the pollution of the water by impurities, that may be admitted during its transit from its source to the reservoir from which our water is obtained. These contaminations often come through washings from dwellings, factories, cities or from the decaying diseased animal or vegetable matter. Open wells and cisterns are often polluted in this way or by the settling of dust into them, that may contain many diseased germs. It has been thoroughly proven by experiment that many epidemics are usually spread by drinking water infected by specific germs or spores, are capable of producing in healthy persons the same specific disease. Cholera, Enteric Fever, Diarrhoea, Dysentery and Malarial Fever are produced by the drinking of water containing such impurities, and to some extent Yellow Fever.

Cleanliness, ventilation and situation of dwellings or barn are important factors in

preventing the spread of infective diseases.

Although infective diseases are easily spread it took nearly five-hundred years to establish universal quarantine against the most dangerous diseases - as: Small-pox, Typhus, Cholera and the plague, though the latter is now almost unheard of. Small-pox, Typhus and Cholera are engendered among our selves as: Cholera Infantum, Dysentery Hydrocephalus, Erysipelas, Scarlet Fever, Measles, Yellow Fever and others all of which are classed as foreign diseases as well as domestic, with the possible exception of Yellow-Fever.

The fatality of these diseases indicate the necessity of quarantine. In twenty-five years, Cholera coming from abroad, and raging five separate times in New York, has caused twelve thousand five-hundred deaths. In the same period Cholera infantum, generated at home has slain fifteen thousand, and hydrocephalus and convulsions together, thirty-two thousand four-hundred. Small-pox previously an almost preventable disease carried

off over ten-thousand while it left its mark on more than fifty-thousand others.

Modes of infection of disease may be; direct or immediate and indirect or mediate. Direct or immediate infection is when the contagium is conveyed from one animal or person suffering from the disease, to a healthy one with the diseased one.

Indirect or mediate infection, is when the contagium is carried through the medium of a foreign body containing the contagium. It occurs in many ways - in fact almost every thing in form of solids or fluids which have been in contact with the diseased, may carry the virus. (In case of animals by their secretions or excretions, forage is liable to be affected.)

The medium may be the air, clothing, bedding, or baggage. The virus may be carried from one body to another without losing its contagious properties and the nearer the communication with the sick the greater the chances for transmission by these different media.

The mosquito-theory of spreading malaria was thought quite probable by some of the ancient Romans, but not fully proven by science to be caused by direct transmission from man to man by the bite of a mosquito, until 1881 Dr. Carlos Finlay proved by experiment that malaria and Yellow Fever could and was transmitted by the mosquito. It is shown that the disease rages greater in temperature where the mosquito existed, and that at a higher elevation of the same region, but having higher temperature there was comparatively few cases; the mosquito not being present. The mosquito haunted pools dry up; the dry sediment containing the plasmodia is blown about in the dust by winds, falling into our water or may be inhaled by man. In this way we account for the occurrence of cases of malaria, which apparently, though are not really connected with any swamp or stagnant water.

Typhoid Fever has been ascribed by the cause of bad drinking water, but in many cases it has been known to be due to shallow water

closets or decaying animal matter frequent and from which they spread many infective diseases to every dining-room and pantry; that happens to be near by. Water from swamps or shallow wells originate diseases of a malarial type, but often the sickness that is fatal is caused by the filth that is born on insect wings.

In 1868 it was suspected that the tick carried the Texas Fever, but was condemned by unwise men. Since that time it has been positively proven by experiment that the tick does carry the disease. The fertilized female after a short time drops dead to the ground and there deposits from a one to two thousand eggs, nearly all of which hatch after a short time and the young embryos attack themselves to the host and begin a new life cycle. If healthy cattle are placed in a place infected with the embryo ticks, the young tick fastens its self onto the cattle, sticks its proboscis into the animal, and discharges the parasite into the host during the process of drawing

flood. The Texas Fever can be transferred from one place to another only through the infected tick. These ticks are spread abroad by driving the cattle having them on through an uninfected district, or by transportation it is carried by the bedding in the car.

Quarantine can do much toward excluding such classes of diseases. Small-pox, Typhus, Scarlet-Fever and Measles.

The essence of quarantine laws is to direct against the importation of contagious diseases. Almost from the time of the first settlement of the western hemisphere defences have been made against the introduction of diseases. It has been the constant care of every country, city, town or hamlet.

With all the knowledge gained regarding the nature and causes of infectious diseases, it has been found that no specific regulations apply to all, and that quarantine laws depend upon the nature of the specific diseases.

There are now ten or more national quarantine stations, that have steam disinfecting

chambers and proper equipments, to aid in controlling disease, stations are at Boston, Portland, Me., Reedy Island, New York, New Orleans, San Francisco, Galveston, Key West, San Diego, Mobile, Mullet Keys Baltimore and Pensacola. Under Inland Quarantine practically the same means are employed to prevent the spread of any epidemic from one locality or district to another, as those used by marine quarantine.

The following cover the human present quarantine laws and latest regulations of the United States ^{and} are planned to afford the greatest possible protection to the country against the importation or transmission of disease with out any unnecessary detention to bring about this end there have been established quarantine stations in foreign lands, for the purpose of inspection and, if necessary, disinfection, by officers of this government, of all vessels, passengers or cargoes leaving a foreign port to any part of the United States. This has undoubtedly reduced

the danger of introducing many contagious diseases, that would otherwise have spread rapidly. In addition to this the President has power, when at any time, condition of affairs seem to deem it necessary, "to prohibit, in whole or in part the introduction of persons, or property from such countries or places as he shall designate and for such period of time as he shall deem it necessary."

Accordingly, any vessel leaving a foreign port to this country must first obtain from from the United States. Consular officers of the port, a bill of health, "stating there in the sanitary history and condition of the said vessel, and that it has in every respect complied with the rules and regulations for securing the best sanitary conditions of the vessel, its cargo, passengers and crew." Before signing this bill of health the consular officer must be satisfied that such conditions are true, and he must personally inspect all vessels from ports at which cholera prevails or Yellow fever, Small-pox or Typhus

Fever prevails in epidemic form; and "all vessels carrying steerage passengers": the ship must be clean in all parts before taking on any passengers or crew, and if any part is liable to infection, it must be disinfected, especially if any disease has occurred on any previous voyage; the bedding must be destroyed or disinfected before it can be put to any other use. There are strict regulations stating what kinds of cargo can be taken through, while others must be disinfected under any circumstances.

In case of shipping passengers, they are divided into two classes, cabin and steerage and no one afflicted with cholera, Small-pox, Yellow-Fever, Typhoid or Scarlet Fever, Measles or diphtheria is allowed on the ship. Steerage passengers and crew who have been exposed to Small-pox must be vaccinated before leaving port unless they can show proof of immunity by former attacks or vaccination. If they are exposed to Typhus they are not allowed to set foot on the vessel until

fourteen days have elapsed since their last exposure and all their baggage must be disinfected. In case of cholera infection they are to be detained five days in suitable quarters and under-go treatment and disinfection.

Cabin passengers coming from any infected port or district must give; place of abode at least for five days before embarking; if, for any reason, there is suspicion of infection he and his baggage must under-go the same method of disinfection.

To complete the role of sanitary rules every passenger must have an inspection card, stamped by the medical officer, giving name of person, ship, port and date of leaving. All baggage of passengers must have the seal or stamp of the United States medical officer, stating name of port and ship carrying the baggage, also the date of inspection or disinfection.

The conditions under which arriving vessels are to be placed in quarantine are:
 "a. - With quarantinable disease for the

purposes of these regulations being, Cholera
 Yellow Fever, Small-pox, Typhus Fever, and
 leprosy. B. Having had such on board during
 the voyage or within thirty days next
 preceding arrival; or, if arriving, in the quar-
 antine season, having had Yellow Fever on
 board after March first of the current year,
 unless satisfactorily disinfected there after.
 C. - From ports infected with Cholera or
 where Typhus Fever prevails in epidemic
 form, coming directly or via another for-
 eign port, or via United States ports unless
 they have complied with the United States
 quarantine regulations for foreign ports;
 also vessels from non-inspected ports with,
 Cholera, Yellow Fever or where Typhus Fever
 prevails in epidemic form, except as sub-
 sequently noted. D. - From ports where Yellow
 Fever prevails, unless disinfected in accord-
 ance with these regulations, and not less
 than five days have elapsed since such
 disinfection."

Some exceptions may be made in rules

C. and D. with regard to quarantine against Yellow-Fever: (1) "If any vessel comes between November 1st and May 1st they may be admitted. (2) vessels bound for ports in United States north of southern boundary of Maryland, being in good condition and health, with no sickness on board at departure or on arrival, may be allowed to enter their port of destination. (3) Vessels in fruit trade from ports declared safe for that purpose by the supervising-Surgeon-General of the Marine Hospital Service may be admitted without any detention," providing they carry nothing else on board.

"No case of leprosy on board will be landed, and vessels arriving at quarantine with leprosy on board shall not be granted pratique until the leper with his or her baggage has been removed from the vessel to the quarantine station." If the leper is an alien and a member of the crew, and the vessel is from a foreign port, said leper shall be detained at the quarantine station at the vessel's expense.

until taken aboard by its return trip outward bound:

The following regulations govern the transportation of stock:— There shall be no transportation of stock from a quarantine district, unless otherwise specified by rail or boat except for immediate slaughter. During such transportation if necessary to unload to feed and water, they must carefully observe all the sanitary laws provided by the officers of the State, where unloading, and into such pens, chutes and always as are provided for that purpose. All cars or boats carrying infected stock must be cleaned and disinfected as soon as possible after the unloading, and before they are again used to transport, store or shelter animals or merchandise. All cars carrying cattle from any infected district must bear printed placards giving the name of the infected district: the way bills also must show where the cattle are from. If inspected and found free of disease, may be moved with out restriction unless, liable to

be exposed to some such disease on the route. Some complaint against the quarantine for stock is that often; if the stock of any kind came from a suspected place, going to the market they are run into quarantine pens, and there sold at much lower price, than otherwise would have been. Then again stock men who have fatten stock to sell, if they happen to be below the quarantine line, they can never ship out except certain months of the year without the quarantine brand.

Some complaints against quarantine by sea captains. "Vessels are detained for a long time in quarantine for little or nothing their cargoes discharged at a heavy and unnecessary expense, not to preserve the health of New York for the benefit of whom it may concern. Statements of few exactions made on vessels, from health officers who board her for inspection; his fee is six dollars and fifty cents. Followed by Port Warden whose fee is five dollars for looking at the hatches, then followed by the Frongicator whose fee is six dollars. After which the Steward

presents his bill for discharging the cargo and will not commence until the bill is signed as correct; he charges forty-four cents per hog-head for sugar and other similar articles and if refusal let the stevedore do it, the loss in waiting for lighters is more than the stevedore's price for storage. After all is discharged they are again discharged six dollars for the fear of exposing a near haddful of cholera of line in the hold. If any damage on board or not, it is supposed to be turned and charged six dollars, many vessels, after having permits to discharge from health officer have waited one to two weeks for the stevedore to discharge them.

The regulations for the future quarantine there should be all the appliances and things necessary for the caring for and checking of any disease. Such as an ingenious mind can invent for a modern and up to date twentieth century quarantine station. If a quarantine port is needed it should be perfect in every detail, having first, a boarding station, including a boat house with boatman's quarters, 2nd A

boarding steam-boat. 3rd A clean anchorage for
 the detention of infected ships, being in a
 convenient place and out of the route of Com-
 merce. 4th A fumigation steamer with all appli-
 ances necessary for using live steam or
 fumigating gases and disinfecting chambers.
 5th A Lazaretto for treating contagious diseases;
 also non-contagious ones. 7th There should be
 comfortable quarters for those to stay in who
 have only been exposed to the contagion or in-
 fection, also separate quarters for the medical
 officers. 8th There should be a crematory and all
 bodies that have died from any contagious dis-
 ease should be cremated. Reliable, well quali-
 fied inspecting officers should have charge
 of these stations, and should receive a liberal
 salary. Then there will be little danger of the
 spread and entrance of the contagion in our
 country, and if any detention is necessary it
 will be only so long as is necessary, (to disin-
 fect every thing), and by scientific hygienic
 means to remove every trace of the suspected
 infection. No property or stock of any kind

will be detained or misused in any unnecessary way that will cause a greater loss to the owner.