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.

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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 localit) 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 quarantine. It now indicates the entire routine of inspection, disinfection and detention, without regard to the length of time involved.

Some measures for the prevention of the spread of infectious disease can be traced to the mosaics law in the early ages. In the thirteenth and fourteenth chapters of Deuteronomey, 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 immolation to guard against the plague. And when the pestilence broke out among them we saw Harm, taking his censer, filling it with aromatic spices and standing 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 unclean 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 seaports, 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 quarantine 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 notables, they called it the Council of Health. The duty
was to investigate the best means of preserving health and prevent the introduction of disease from abroad, and a lazaretto was established. The law 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 pig-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 imposed for over four hundred years. In 1720 Marseille, 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. The
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 adoption
and rigid enforcement of our present quar-
antine laws.

The term infectious 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
contract, 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 cli"
conditions, aid in the spread of many diseases by bringing 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 environment is 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 nutrient.

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 nutrient produces an abnormal condition and hence predispose to disease.
Of all the many causes liable to spread infectious disease, 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 vats 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 Malaria. These are produced by the drinking of water containing such impurities, and to some extent Yellow Fever.

Cleanliness, ventilation and situation of dwellings or town are important factors in
preventing the spread of infectious diseases. Although infectious diseases are easily spread, it took nearly five hundred years to establish universal quarantine against the most dangerous diseases—smallpox, typhus, cholera, and the plague, though the latter is now almost unheard of. Smallpox, typhus, and cholera are engendered among our own races. Cholera, infantilis, 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 indicates the necessity of quarantine. In twenty-five years, cholera coming from abroad, and raging in separate times in New York, has caused twelve thousand five hundred deaths. In the same period cholera infantilis, generated at home, has slain fifteen thousand, and hydrocephalus and convulsions together, thirty-two thousand. Smallpox 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 everything in form of a slide or fluid which has 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 with out losing its contagion 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. It was concluded by direct transmission from man to man by the bite of a mosquito, until 1881, when 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 exists, 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 swamps or stagnant water.

Typhoid fever has been accredited by the cause of bad drinking water, but in many cases it has been known to be due to shallow water.
cloths or decaying animal matter ferments and from which they spread may infective disease to every living room and pantry that happens to be near by. Water from swamps or shallow wells originate diseases of a material type, but often the sickness that is fatal is caused by the folk that is born on insect wings.

In 1865 it was suspected that the tick carried the Texas Fever, but was condemned by service 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 develops from one to two thousand eggs, nearly all of which hatch after a short time and the young embrove attack themselves to the host and begin a new life cycle. If healthy cattle are placed in a place infected with the embrove tick, the young tick fasten itself into the cattle, stiche its proboscis into the animal and discharge the parasite into the host during the process of drawing
flood. The Texas Fever can be transferred from
our place to another only through the in-
fected flies. These flies are spread abroad by
driving the cattle having them on through
an uninsected 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 Measlees.

The essence of quarantine has been to
direct against the importation of contagious
diseases. Almost from the time of the first
settlement of the western hemisphere defenses
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 regulation
apply to all, and that quarantine laws depend
upon the nature of the specific disease.

There are now ten or more national quar-
antine stations, that have steam disinfecting
Chambers and proper equipment, to aid in controlling disease, stations are at Boston, Portland, Me., Riedy 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 are planned to afford the greatest possible protection to the country against the importation or transmission of disease without 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 the government, of all vessels, passengers or cargo leaving a foreign port to any port of the United States. This has undoubtedly reduced
the danger of introducing any contagious disease, 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 "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 Syphilis
Fever presents in epidemic form, and "all vessels carrying stowage 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 stowing passengers, they are divided into two classes, cabin and stowage, and no one afflicted with choler, small-pox, yellow fever, typhoid, or scarlet fever, measles, or diphtheria is allowed on the ship. Stowage 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 typhoid 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 undergo treatment and disinfection.

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

To complete the rule 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 quarantine 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 foreign port, or via United States ports unless they have complied with the United States quarantine regulations for foreign ports, also vessels from non-infected ports with Cholera, Yellow Fever or from ports where Typhus Fever prevails in epidemic form, except as subsequently noted. D. From ports where Yellow Fever prevails unless disinfected in accordance with these regulations, and not less than five days have elapsed since such disinfection.

Some exception may be made in rules.
Council R. 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 joint 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 forage 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 stalls as are provided for that purpose. All cars or boats carrying infected stock must be cleansed and deinfected as soon as possible after unloading, and before they are again used to transport, store or shelter animals or merchandise.

All cars carrying cattle from any infected district must have printed placards giving the name of the infected district; the map title also must show where the cattle are from. If inspected and found free of disease, may be moved without restriction unless, liable to
be exposed to come such disease on the route. Some complaints against the quarantine for stock are that often, if the stock of any kind came from a suspected place, going to the market, they are run into quarantine pens, and then sold at much lower price, than otherwise would have been. Then again stock men who have gotten 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 frank.

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 exceptions made or vessels from health officers who board her for inspection, his fee is six dollars and fifty cents. Followed by Port Wardens whose fee is five dollars for looking at the hatches, then followed by the stowage, whose fee is six dollars. After which the stevedore
presents his bill for discharging the cargo
and will not commence until the bill is sig-
ned as correct; he charges forty-four cents per
hog head. For sugar and other similar articles
and if refused let the stevedore do it, the loss
in waiting for lighter is more than the stev-
edore's price for storage. After all is discharged
they are again discharged six dollars for the
force of exposing a near handful of chibride
of live in the hold. If any damage on board
or not, it is supposed to be burned and charged
six dollars, many vessels, after having permit-
to discharge from health officer have wanted one
to two weeks for the stevedores to discharge their

The regulations for the future quarantine
there should be all the appliances and things
necessary for the caring for and checking any
disease such as an ingenious mind can in-
vent 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 first rate quarters, etc.
A clean anchorage for the detention of infected ships, being in a
convenient place and out of the route of com-
mercial. 4. A fumigation steamer with all appli-
cances necessary for using live steam or
fumigating gases and disinfecting chambers.
5. A lazaretto for treating contagious diseases.
6. A crematory and all provisions 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 dis-
fect every thing, and by scientific hygienic
means to remove every trace of the infected
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.