T H E S I S

CONTROL OF COMMUNICABLE DISEASES

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INTRODUCTION

Each generation as it grows older is convinced that the world is rapidly going to the dogs. Jeremiah daily arises and announces that such and so is not as it used to be and that this and other institutions, as well as traditions, are rapidly deteriorating. There is an abundance of contributors to the "literature of despair" which is so characteristic of the present age.

Regarding certain things there may be sufficient grounds for such high hopes for the future, and we would be very foolish if we did not consider every sort of warning that wisdom dictates, but whatever may be true in other lines of endeavor it is certain that considerable progress has been made in the control of various infectious and communicable diseases.

The relative security we find today, which characterizes the twentieth century, makes it almost impossible for us to believe the extreme disasters, fear and suffering that predominated in the days of dirt, disease, ignorance and pestilence. Only a few detailed stories of pre-historic times are necessary to make each and every one of us appreciate the immense distance that we have traveled since the earliest records of diseases which swept the lands at

tremendous speed. Such study enables us to understand the tlargeons contribution that medical science has made in the welfare of both happiness and finances of the world today.

The development of the science of medicine shows three distinct stages: (1) the stage of superstition; (2) the stage of collection of facts and the classification of the same; and (3) the stage of application of facts. In every nation the history of medicine has passed through each of these stages at different times, varying with their degree of progress which was characterized by individual thinkers, many of whose names have been passed down in the history of medicine from years unknown. Preventive medicine, as it applies to the transmission of disease, is rather well into the second stage and considerable progress has been made in the development of the third stage. To be certain, there are still a great many people who are still under the influence of various inane, interesting and bizarre superstitions, but the progress of the last few decades, and especially the last few years, is ample proof that something more than superstitions or demons is available for the prevention of these diseases. Be it as it may, the superstition of the ages past makes most interesting reading and presents many striking contrasts with our pessimists who live with dreams of the golden age and with certainty that the past will never be equaled in the future.

Ancient Medicine

Ever since the beginning of life, mankind must have ex-

perienced injury and disease and in some way made attempts at prevention, relief or cure, under the influence of the instinct of life preservation, or of the parental feeling and sympathy for others. Little by little this knowledge crystalized and formed the beginning of our modern day medical knowledge, even though it is far removed from its beginning. In pre-historic times the causation of disease by natural agencies was not recognized, and tragedies, such as death in battle, were explained as due to the activity of sorcerers. To counteract these hostile actions, appeal was made to magic and elementary religious procedures, so that preventive medicine, magic, and religion becomes inseparably connected. The different ways of which magic was used varied considerably, from Shaman who strove to coax, charm, or drive the evil spirit out of the sufferer's body by repulsive treatment or terrifying noises, to the constant praying; to the various Gods by loved mothers; to the inhuman practice of witchcraft by members of community. The Neolithic skull speaks of an even more terrifying treatment so often practiced by the skars of early trephenning which was done for epilepsy, infentile convulsions, and various cerebral diseases in order to provide a way for the confined demons to escape.

Egyptian Medicine

Our knowledge of the early practice of Egyptian medicine is chiefly derived from Papyri. This knowledge reveals that the beginning of Egyptian medical practice sprang from the

inhabitants along the Nile soon after the discovery of copper which raised civilization out of the stone age. From this early time we have the names of two well known Grecian medical men leaving Gario and Zoses [1] the latter became the most famious God of all whom the Greeks called upon not only to protect them from harm on earth but also to guide them on their heavenly journey.

Maspero[2] states that the Egyptians believed that disease and death were not natural and inevitable, but caused by some malign which could effect the body in many different ways and might be invisible. They interpreted it as a God, a spirit, or the spirit of a dead man who had cunningly entered the living body and through itself upon him with irresistible voilence. Once in passession of the body the evil spirit could break bones, drink the blood and suck marrow and continue all kinds of distructive work until it had been driven from the body. They deemed it necessary in treating these cases to first discover the nature of the spirit in possession and if possible its name and then attack it in such a way as to drive it from the body or distroy it. He then must treat the individual with medicine to build up the disorders produced by the spirit. In this way disease was treated both by Prayer and medicine which took the form of counterirritants, and

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[1] Breasted, "A History of Ancient Egyptians," Page 104, Scribner, N.Y. 1908/

[2] Maspero, "Life in Ancient Egypt & Assyria," Page 119, London, 1891.

cupping and certain erbs or other pharmacopoeia of which the ingredients were made from the different secretions of the body, powdered worms, insects and snakes. It is these ingredients which composed "The Royal Pharmacopoeia of Charras Moses," (London A.D.1678)

Embalming which revealed a certain amount of knowledge about the organs for these early medical men and familiarized them with the idea of opening the dead--a practice which was prohobited in most places but common in the Greek and Alexandrian Schools (300 B.C.), reflect light upon type of diseases of the Ancient Egyptians. The most common recognized diseases of these mummies which are approximately 3500 years old, are osteo-arthritis, ulcers of lungs and symptoms of rickets and Syphillis and Arteriosclerosis many of which are also found in animals of the same age.

GREEK MEDICINE

Assyria & Babylonia Medicine

In early Assyria and Babylonian History we find that they too thought that disease was due to evil spirits and demons. There were different incantations recited by the priests for the different diseases, the mysterious character of delivering the incantations was thought to add to their ability in driving away the demons. Much progress was made in these countries as to the diagnosis and treatment of common diseases, but as long as cure of disease was practiced by the priests the recital of sacred formulas was stressed as much as the taking of the prescribed remedies., progress was handicapped.

The first recorded observations on anatomy was carried down from early Babylonian medicine where they predicted the future by certain signs such as the position of the organs in the sacrial animals. From Babylonia this custom was spread to Etruscans, Hebrews, Greeks and Romans.

The liver impressed these early observers as the most important organ and perhaps due to its rich color and blood it became known as the seat of life.

Hepatascopy became a very extraordinary and complex study among the Babylonians, as the organs of the sheep was studied as definite signs for future prediction as early as 3000 BC. The earliest known anatomical model which we have on record is the clay model of a sheep's liver preserved from Babylonia from 2000 BC. Other organs such as the lobes

of the ears, gall bladder and appendix were used to a less per cent to predict the future,[2] Babylonian and Assyria thought that the liver was the sole organ of devination for many thousands of years but it became a meaningless superstition to the Romans within a few years.

Babylonia and Assyria also give rise to the theory that the future and man's welfare was dependent on the heavenly bodies. In order to evaluate the meaning of the heavenly bodies a system of interpretation was worked out; it was less elaborate than the system of hepatoscocpy but according to Jastraw[3] it was this belief that caused them to exchange their profession of diviners for astronomers. From Babylonia the astronomy beliefs passed to Greece but it did not influence the Grecian medicine to any extent. Both Babylonia and Greece astronomists thought that the law controlling the plannets corresponded to a fate ordained for every individual from his birth and the same could be predicted by the plannets at that time. For the main part Oracles were sought on all occasions from planting of a tree to mating of stalk, it enfluenced nearly all popular thought and religion, however science at that time also attracted the intelligent and we see men like Tacitus and Pliny[1] debating with themselves whether man's affairs are governed by the plannets or a

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[1]Morris Gastraw:Loc. Cet. Page 122

[2]Geneses: XLIV, 5,12 and Ezekiel XXI, 21

[3]Morris Gastraw: Aspects of Religious Belief and Practice in Babylonia

[1]Pliny: Natural History,Bk.XVIII, Chap.XXV,Sect. 57

mere chance. The main belief was so strong at that time that Cato waged war on Greek physicians for disregarding astrology as a science, they also passed a sentence of death on many mathematicians.

From the Hammurabi Code 2000 BC which contained a number of laws civil and religious, we learn that crude operations were done and that the veterinarian art was recognized on a fee basis in return for services.

Much of our present day knowledge had its origin, as can be seen by early Grecian history, in the dark and medieval ages. The beginning of scientific medicine no doubt began within the group known as Ionian Physiologists. Among this group a spirit of antagonism arose against the belief in spirits,witchcraft, and astronomy and they turned their minds toward metaphysical and dialectical discussions of philosophers, the semi-historical methods of Hecateus and Herodotus, and the schools of physicians.

In the fifth century B.C. there were a few medical schools contributed by the South Italian nature philasophers. The earliest well known physician and philosophers was Pythagaras whose doctorine of numbers dominated medicial science up to the 18th century. One of his students, Alemaeon from the Crontonian school recognized the brain as the organ of the mind. He also discribed the organ and the function of the Eustachian tubes and optic nerves and made correct abservation upon the mechanism of the eye.

In the Sixth Century B.C. a fairly well devised scheme of public medicine existed in the cities and was supported by some form of taxation.

In the Fourth Century B.C. the snake was held sacred by the Greek and was symbolic of healing power. This belief was carried over and practiced in the temples of Epedarus which were dedicated to Asklepois. This temple provided an opportunity for scientific research and advanced methods such as rest, sleep; hot mineral springs, cleanliness . were employed.

Hippocrates who died about 375 B.C. known as the father of medicine was first to repudiate the teachings of his time viz; that disease were of divine origin; that all diseases were of a natural causes. We learn from his teachings the unlimited importance of"careful observation", He was of a democratic trend of mind and believed that physicians should place his patient above all personal thought regardless of their financial or social status.

From Hippocrates death until the finding of the Alexandrian schools little was done to improve on medical knowledge.

Garlen, (130 A.D. to 200 A.D.) perhaps contributed more to our medical knowledge than any other early Greek physician. Unlike most of the early doctors Galen studied at the best medical schools including Alexandra, he learned the value of observation, experiments and philosophy as no other physician at that time or since has been able to utilize. He paved the way for the discovery of circulatory system by discovering

and defining thefunction of the heart values, the arteries and veins and demonstrated that arteries contains blood and not air as was thought by his predecessors. Galen placed considerable stress on the conditions out of which disease was caused and was an instigator of better water and sewage system project of which Rome is still famous. No other physician has ever occupied the commanding position of Claressimus Galen. For fifteen Centuries he dominated medical thought as powerful as Aristotle did in the schools.

Following the progress of these great medical men the entire universe seemed to enter a state of desolation called the middle or Dark Ages. For more than a thousand years through the broad plain of Greek civilization, the stream of scientific medicine which was being so rapidly advanced was nearly lost or drowned out by the religious turmoil of the middle Ages. However, the South Italian Schools, some few Galen followers and then the use of the universities of the Thirteenth Century.prevented a complete loss of medical knowledge.

Hebrew Medicine

The records of medicine in the old Testament shows both Egyptian and Babylonian influences; the origin that social hygiene is a reflex of regulations can be traced to the Pyramid Texts. It is questionable whether the Pentateuch dates back as far as Moses but there is no doubt but that it was composed by some one versed in customs of early Egyptian medicine, and was able to point out their most advanced practices. In summarizing in Neuburger[1] states.

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[1]Neuburger:History of Medicine,Oxford University Press-1910,Vol. 1,Page 38.

Commands were passed concerning prophyloxis and suppression of epidemics, supression of venereal disease and prostitution, care of the skin, baths, food, housing and clothing, regulation of labor, sexual life, discipline of the people, etc. Many of these commands, such as Sabbath rest circumcision, laws concerning food (interdiction of blood and park) measures concerning menstruating and lying-in women and those suffering from gonahhrea, isolation of lepers, and hygiene of the camp, are, in view of the conditions of the climate, surprisingly national.[1]

Devination which was perhaps borrowed from Babylonia was very widely practiced and a few references is made to it in the New Testament.[2] The belief in astrology is also mentioned in New Testament. The belief in enchantments and witchcraft was universally practiced and even through many of the names of diseases was handed from the Old Testament to the modern age, most of treatment administered by the Hebrews at this early time was in form of prayer and spittle.

Chinese and Japanese Medicine

The chinese medical practice was so strictly held down by religious belief in Ancient times that we are unable to carry over any of their practices to the present date. The Chinese believed in a universal animism was regulated by Tao who was composed of two souls, Yong represented the soul that stood for light, warmth, production and life; Yin represented darkness, cold, death and earth. This belief developed into a superstition which is similar to our hososcope in that

[1]New Testament Acts. XVI 16 - [2]New Testament Acts VII

if an individual is born at a sertain time he will be prone to certain prolonged diseases and must take more precautions to keep Yin animated by Tao. This practices predominated as early as the Fifth and Sixth Century.

Among this confusion of superstitious belief they also developed a few phases or theories that seem remarkable.

The pulse was studied to a great extent. A smooth, regular rhythm signified health, while an irregular pulse rate meant disease.[1] (see page 13)

The Chinese practiced in a very crude way inoculation for smallpox as early as the Eleventh Century. They learned this from acupuncture. Organ theraphy was also as extensively practiced in China as in Egypt.

The strict religious beliefs, stagnation and sterility handed down in China from the Eleventh Century effected their medical practice for thousands of years. In fact it is doubtful in some parts of China whether they are much more advanced at the present time than Egypt was when the Epers Papyrus was written.

Japanese medicine in the beginning is similar to that of China. The pulse rate characterized their practice but in the Fifteenth Century the European medical practice was introduced in Japan by the Portuguese and Dutch. In 1771 Mayeno demonstrated the position of the organs as shown in the European anatomical tables and in 1773 Kulumus completed the translation of anatomical work in Japanese language which marked the beginning of medical reform in Japan. In 1857 a Dutch medical school was started in Yedo. Since the political upheaval in 1868, Japan has made rapid progress in scientific medicine

and its institutions and teachers are among the best known in the world.

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[1] Y. Fujikawa "Geschichte of the Medicine in Japan"

SOME SALIVA BORNE DISEASES

The Common Cold

"Don't do that or you will catch your death of cold," is usually the parental admonition against which youth universally rebels. The gallant young chap shrinks from the disapproved glance which he will probably get from his friends when he appears all tagged out in a bulging rain coat, heavy pair of rubbers and black umbrella. If the safeguards against weather and colds were a little less cumbersome and not so often thought of as female weaknesses, parents and health advisors would stand a little more chance of having their advice taken.

There is no doubt that the common cold is the most infectious of all contageous diseases. We do not often consider a cold as a very serious problem, but if we were to comput the total cost of disease in terms of dollars lost as a result of sickness, inefficiency, permanent injury, and loss of life, we would probably conclude that this is a more important infectious disease than tuberculosis.

Colds are caused by germs which enter the body through the respiratory track, usually under predisposing conditions. It is the general opinion that colds are not caused by any one specific germ but that many different kinds are capable of producing cold symptoms. It is certain that if no specific

germ produces the disease the problem of making an effective vaccine or serum is a difficult one. At present there are a number of vaccines on the market which have been used with a varying amount of success, depending to a large extent upon the type of germ producing the cold. The cold germs also have different ways of attacking individuals. We occasionally seem to have epidemics that produce similar results, such as the head cold epidemic in 1924, and the sore throat and tonsilitis epidemic of 1925. Many susceptible persons are liable to have a cold time after time in some portion of the respiratory tract; Some people are effected by head colds, others by throat colds, another may have thecold in the voice box with resulting hoarseness, and still another person may have it in the lungs.

Colds are often segregated into three distinct classifications:

1. The congestive cold.
2. The highly infectious cold.
3. Influenza ("Flu") or Spanish Fly.

Some authors disapprove of classifying Flu as a type of cold, but due to the similarity of the diseases, most authors seem to agree that it is a type of cold, being merely verulent. At certain times influenza has appeared in great epidemics and pandemic forms as far back as the beginning of the Christian era. From as far back as we have

record we have had with us continuously a perhaps mild form of influenza, commonly called "flu" or "the grip", which seldom causes death, and only then when followed by other diseases or when the patient is very aged. We have had two large epidemics within the span of our present life time. One occurred in 1890-1891 and theother during 1917 and 1918. The last one began in Europe in 1917 and spread over the entire world within a very few months. It effected both the young and aged, the result of which are familiar to us all. The germ producing this epidemic increased in verulence as it was passed from one individual to another, as if gaining in power and experience in its disease producing ability. Likewise, the epidemic in the army camps of the World War grew more severe as it was passed rapidly from one victim to another in these closely confined quarters. Perhaps the most terrible thing about this disease, in spite of studies made and the knowledge gained by our medical profession, is still beyond control. However, the epidemic of the last year proved that we are more capable of coping with contagious diseases than we were twenty years ago, thanks to the cooperation given by the general public in carrying out isolation rules. As far as the disease itself is concerned, we are still limited in our knowledge as to how to kill the germs.

The congestive type of cold is accompanied by an experience of suddenly becoming chilled after having been too

warm and within a short time becoming hoarse. It is sometimes accompanied by a light dull feeling in the chest. The explanation of this phenomenon, given by Dr. Rice, seems quite reasonable. The patient has been warm as a result of exercise or being in a warm or over-heated room, after which he becomes quiet and sits or stands in a cool place or in a draft. The skin, which was flushed with blood because of warmth, is suddenly chilled and the blood vessels contract. This sudden change in circulation causes congestion. This may be noticed in the lungs, mucus membrane of the nose, and throat, and kidneys. In the early stage of this process a reversal of these conditions may easily be brought about by hot baths, hot drinks, warm dry clothes, or a warm room. It is this condition which popularized the "hot toddy" as a specific for colds, because it flushes the skin and thereby relieves internal congestion. Of course, a hot bath and drink of lemonade can do all that whisky can do or more but there are many people who would take the whisky but not the bath.

In this type of cold it is inconceivable that the bacterial sction should work so rapidly after congestion occurs, but there are always many different kinds of bacteria in the throat. They seize the opportunity to display their strength when the field is made ideal for them like it is during the congestion of the blood vessels. After the bacteria start to multiply they have to be overcome by protective mechanisms of the body. These protective mechan-

isms usually, unless ideal circumstances, take from two to three days.

This type of cold is infectious to those who come in contact with the patient due to the increase of verulence of the disease producing germ in the process of multiplication. Chilling plays an important part in causing a "cold", as the name indicates, but there are other predisposing factors which perhaps contribute just as much, like over-heating the body, bad ventilation, lack of exercise, loss of sleep, over-work, or general lessened physical conditions. Crowding a large number of people in a small place also contributes its share, especially when the individual's personal hygiene habits are not up to par. Education of the general public by health teachers of the harm done by these predisposing factors will do much to control this kind of a cold.

The highly infectious cold presents an entirely different kind of problem. Personal hygiene and the maximum of physical health does not make one immune if he is exposed to the infection. Only a re-education of the public to the fact that it is the wise and thoughtful person who stays at home and doctors a cold and not a "baby" or a "sissy". Only by isolating the individual with a cold and by giving him proper care, not only for the sake of the individuals own health, but for the sake of the communityas well, can this disease hope to be controlled.

At the present time, due to popular opinion, this is practically impossible. If there was a specific to prevent colds it would be one of the greatest contributions made to medical science, but at the present we have not such knowledge. We are told to preventcolds by plenty of exercise, fresh air, cold baths in the morning, by avoiding overheated rooms, too much fatigue, by avoiding crowds, and prevent others from sneezing and coughing in your direction (as if we wouldn't do this any way if possible), keep our hands out of our mouths, and a hundred other things that are all, of course, perfectly good advice. But accidents will happen and at times with no regards to our living conditions. Vacines of various kinds have been advocated and many persons no doubt have been made more resistant by the use of them, but we must remember that there is no known specific germ and that, having a cold, does not cause an immunity. At the present time there is no specific remedy. Although many people who have a chronic infection in the nose, throat, and sinuses are helped by the use of "antogenous" vaccine. As we have not, at the present time, any method of preventing all colds it is doubly important to consider alternative methods. It is the complications of the prolonged cold that causes most damage and for the main part, could be prevented if we could re-educate the public to seek good medical advice in place of using the old familiar home remedies that have been passed down from generation to generation.

PNEUMONIA

Pneumonia is a disease in which there is little to be gained in the early history, because the method of differentiating it from other resperatory diseases were very unsatisfactory until about the last of the eighteenth century. Hypocrates (460-370 B.C.) included all diseases of the chest which were accompanied by pains in the side under the name of "peripneumonia". The name existed for over 2,000 years. The symptoms which he recognized as accompanying this disease, listed in his "Regime in Acute Diseases", were: acute fever, pain in one or both sides, dyspnea, cough, colored frothy sputum, concentrated wine, and a tendency to improve on the seventh day. The treatment he advocated was severe bleeding, hot water bottle over bladder region, linseed poltice over the hypochondrium region, sufficient attention to the bowels, sufficient covers for warmth, and apoponax and barley water for a drink.

Aretaeus gave a clearer account of "peripneumonia" (131-201 A.D.) as an inflamation of the lung which causes acute fever accompanied by pain only if the attachments of the lung to the chest is involved. In addition to the symptoms mentioned by Hippocrates he added thirst and a tendency to assume a sitting position.

Very little progress was made from this time until

1624-1689 when Thomas Sydenham, English, gave an account of the disease. He believed that pleurisy and pneumonia were of the same nature except pneumonia effected the lungs more universally. John Huxham (1692-1768), a student of Syndenham, after some careful observation invented the formulae of the compound tincture of cenchrona, now known as Huxham's tincture which is still used for a tonic during this irritating disease. In 1728 Herman Boerhaave, who profited by the study of anatomy, differentiated "peripneumonia" from pleurisy and described two different types of the disease. Giovanni Morgagni (1682-1771) advanced this knowledge by describing the post-mortem appearance of the lung as a consolidated texture. He also noticed the adhesions on the surface of the pluerae.

William Cullen (1710-1790), founder of Glasgow Medical School, professor of medicine, and author of the contribution "Systematic Arrangement of Diseases", changed the name to pneumonia.

In 1761, Leopold Auenbrugger advanced the means of diagnosis of consolidation of the lung by palpitation. However, the greatest advancement of all was made by Hyacinthe Laennec (1781-1836) who placed our modern conception of pneumonia, pleurisy, pulmonary tuberculosis, and other lung infections on a sound basis. He described a means of diagnosing pneumonia in the early stages, differentiating it from pleuratic afflictions. He was greatly assisted in his theories by the invention of the stethoscope.

In 1819 he published his work and conclusions in which he brought out the following important factors.

1. Pleurisy is an inflamation of the Pleurae and not the pulmonary tissue.

2. Acute pneumonia has three distinct stages: inflamatory congestion, hepalization, and purulent infiltration.

3. He regarded râle as a definite sign of the early stages of pneumonia.

Thomas Addison in his "Observation on Pneumonia" (1837-1843), believed that the seat of the disease was in the air cells of the lungs and that the pneumonic deposits were poured into these cells. This was contrary to the former theory that it was in the interstitial tissues of the lung.

In 1882, Carl Friedländer noticed that the lung in pneumonia contained cocci but the significance of this discovery was not known until Albert Fränkl, a little later in the same year, discovered and described the diplococci which differentiated that case from the one discovered by Friedländer.

In 1886, Weichselbaum studied various types of pneumonia and isolated bacteria. His studies corresponded to that of earlier workers. It is generally believed that the diplocci organism is present in about 95% of all lobar pneumonia cases. Louis Pasteur also proved that this organism is often found in the mouths of well people.

It has now been proven that there are four different strains of pneumococcus, known as type $\dot{\text{I}}$, $\ddot{\text{II}}$, $\dddot{\text{III}}$, and and $\dot{\text{IV}}$. Type one and two are found in sixty percent of pneumonia cases. Type two has a relatively high venulence. Type three accounts for twelve percent of cases and has a mortality of about forty-five percent. Type four accurs in twenty-four percent and causes a 16% mortality. This research work was brought out by the Rockefeller Institue of New York and has proven to be of considerable value in the treatment by serum.

As time advanced some of the treatment suggested by Hippocrates have been changed slightly to meet the accustoms of the day, such as the administration of fluids and stress upon proper elimination. Other methods and treatment have been added and eliminated, such as bleeding, administering calomel, quinine, and various kinds of coal tar preparations and chest plasters.

At the present time more emphasis is placed upon efficient nursing care, absolute rest, forced fluids, and administration of oxygen theraphy when necessary. Many Doctors advocate tepid baths to control the course of the fever, but others oppose this treatment with the belief that it tires the patient too much and removes nature's method of fighting the disease.

For many years pneumonia has been treated with various sera taken from immune animals with varying results. This treatment became more popular when the Rockefeller

Institute advanced the theory that the antiserum to be used must correspond to the type of pneumococcus and the mortality rate of acute lobar pneumonia from twenty-five to thirty percent to seven and five tenths percent (7.5%).

There is little proof that pneumonia has ever occurred in epidemic form. Perhaps it came closer in 1918 than at any other known time when a large number of sick soldiers, who had previously had measels, were found to have haemolytic streptococcus in their throats. Many of these cases developed a very accute pneumonia in which symptons of dyspnoea, cyanosis, and often pleural effusion and definite leucocytosis prevailed.

In preventing this disease special care should be given to prevent other diseases as colds, measles, flu, etc., and good hygenic care with regard to mucus contamination should be adhered to always. An effort should be made to keep the body healthy enough to combat these contagious diseases, especially during the winter months. Proper housing also plays an important role in prevention of this disease. This is demonstrated by the large number of cases found in crowded village settlements and in army barracks and camps.

TUBERCULOSIS

It is a very interesting hunt to trace the history of tuberculosis through the ages and watch its progress through the mists of ignorance and superstition to the time when we can see gleams of hope that man's intelligence will rid the earth of this terrible pestalance which has had the upper hand of man since the beginning of history. Only the accumilation of knowledge over hundreds of years and an understanding of facts can any such hopes be conceived.

It is more difficult to trace the history of tuberculosis back to its origin than most other diseases, as diseases of the chest were not segregated until the discovery of the stethescope. There is not sufficent mention made of tuburcular symptoms in the Christian Bible or Mosaic Code to prove it was present or at least of any significance at the time, however there is a reference of caseous nodules in the lungs of animals in the Mosaic Laws in Talmud.

Hippocrates (460-377 B. C.) makes several references to this disease; he gives a description of phthisis and in "Asphorism" $\dot{\overline{VI}}60$ he comments on a gibbon's spine, he discussed a distructive alesion of the lung and he wrote some on glandular diseases which also gave symptoms of tuberculosis. The number of times which Hippocrates

referred to this disease in comparison to others leads one to believe that it was not a serious problem at that time.

There is no mention in Roman literature to be found of tuberculosis previous to Galen's discription of phthisis in which he enters in some detail regarding the different forms of the disease. In this discription he mentions the theraputic value of milk diets and high altitudes.

This disease is traced back in the early Egyptian literature to 1000 B. C. by a discription of a mummy showing a typical Patts disease by Professor Elliot Smith.

There are many references in the Old and New Testaments of the Saxons passing a tuburcular child through a hole in a stone or a wreath,in which process the child was supposed to shed its infermity as it passed through the circle. This treatment without doubt had it's origin in the recognition of the generative and regenerative power of nature and it is one of the fundimental teachings of Aryan belief, being most commonly practiced in the Hindu religion of Vishnu. This belief gave way to healing by Divine Right from which the supposition was created that if "sovereign touch" could heal, it could also "create malady" which was a stepping stone in our well known witch-craft practice. Among others that practiced this method of healing were: Tobert the Pious (996 - 1031 A.D.), Philip $\dot{\underline{I}}$ (1061 -1108), and by his son Louis $\dot{\overline{VI}}$ (1108-1137). In England it was pricticed by Edward the Confessor in 1065 shortly after

which it almost died out only to be revived during Queen Anne's reign at which time Dr Johnson of England was submitted to a royal touch.

From these early days up th the present we have evidence of having some cases of tuberculosis with us.

In (1493 - 1541) Aurealus Theophrostus Bombastus non Hohenheim discribed miners'phthisis.

Richard Wiseman, the Royalist Surgon (1627 - 1676) gave an excellent account of synovial tuberculosis, and he also contributed some literature on the evil of the "Royal Touch".

In 1744 J. Z. Platmer of Leipzig contributed a monograph on Tuberculosis disease of the Spinal Column and a few years later Robert Willan contributed his discription on lupus. In 1810 Laurent Boyle a graduate of Paris University, published a discription of his findings in "Recherches sur la Phehisie Pulmonaire" which was used as a bisis for Laennec's research a decade later. Laennec, who at one time suffered from phthisis studied many cases with particular interest and sympathy, it was during an elaboraborate investigation that he devised the stethoscope which laid the foundation of modern knowledge of disease.

In 1925 -P.C.A. Louis published a monograph on phthisis which was based on the observation of 1,960 clinicial cases and 358 post-mortem dissections in which he corelated the clinical and pathological aspects of pulmonary tuberculosis.

Hirmann Klencke in 1843 and Jean A. Villemin, professor

of Valde Grace proved and at the later date demonstrated before the Académie de Médecine of Paris that tuberculosis is a specific infiction due to an agent capable of transmission by inoculation from man to animal. In 1877 this was again proven by Julius Cohnheim who produced tuberculosis in the anterior portion of a rabbit's eyeball.

Even though many Doctors were sure that tuberculosis was an infectious disease the tuburcular bacillus was not discovered until March 24, 1882 when Kach revealed this discovery before Physiological Society of Berlin. Later in 1882 Koch published a text listing his experiments and results not only in tuberculosis but other diseases as well, in a book called Berliner Klenische Wachenshrift, which later became known as "Kochs Pastulates".

All during the history of medicine the tubercular plague has received more individual and social attention than any other known disease. Partially because of the large numbers of varied aged groupes, which it attacks: and partially because of the suffering, broken homes, waste of time and expense it causes to both the individual and community at large. At one time it is said that one death out of every five was caused from this loathsome disease and even as late as 1910 it was still the foremost cause of death in the United States. It is not at all surprising that society organized itself to combat this evil which was sweeping off such a large percent of our population. The young poor have shown a higher susceptibility to tuberculosis all through

the history of this disease.

Through organized social efforts and better standards of living the death rate has been steadily falling for the last two decades. However there is some discussion as to whether it is falling at the present time or not. The large number of cases either indicates that there are more cases, or the effect of public education, better methods of diagnosing, and increased available care has brought more cases to the front.

The history of tuberculosis in the last few years has taken more of a therapeutic trend. Koch was the first to suggest any thing difinite when he announced the introduction of tuberculin at the Tenth International Congress in Berlin and intimated that it would perhaps some day be used as a treatment or preventative for early tuberculosis. The theraputic ability of tuberculin has never met Koch's expectations and many doctors have disagreed as to whether it has any preventative power at all, but there is no doubt that it has more than met any of his hopes as a diagnostic agent.

The introduction of tuberculin led to various other preventative experiments and many types of sera and vacines were tried , the most important of these was Sanocxysin, but for main part it was defeated along with most of the other distructive efforts by these bacillary germs. The treatment that has proven to be the most successful from the ancient to the modern times are those which increase body resistance such as outdoar life, proper food and improved

hygenic ways of living, and segrigation with proper rest for the sick. The open air treatment was introduced in Scotland in 1747, and 1791 the first open air hospital for the treatment of glandular tuberculosis was opened at Margate which was followed in 1859 by a sanatorium for phthisical patients at Gobersdorf in the Waldenburg mountains which was the first of many hospitals of this nature. In 1887 Sir Robert Philip attempted to corretate early diagnosis, segregation, special routine sanatorium treatment, and follow up work at the Victoria Dispensory in Edinburg which marked the beginning of our modern tuberculosis compaign.

Soon after tuberculosis was found to be so highly infective many scientists turned their efforts toward preventing the spread of the tuburcular bacillus, not only by means of sanitariums which were primarily started for the patients welfare but they also directed their attention toward the factors that make a man susceptable to a such a fatal disease. In 1890 Theobald Smith differentiated the differance between the human and the bovine type of Bacilli which opened up a wide field of prophylactic measures and educational value. Soon after this many attempts were made to prove that tuberculoses was not inherited in France the Granche's system was practised by which the shildren of infected parents were placed with healthy foster parents in rural districts. Another attempt to protect exposed children was made by Calmette and Guérine by innoculating the children with a

special culture in which the virulence of the organism had been reduced to low to cause the disease. This experiment formed the basis of Calmette's vaccine (B.C.G.) which has been used as a means of producing active protection for many years by some doctors, it has also been severely criticized by others.

Even though remarkable knowledge has been learned about this disease no specific remedy has yet been discovered. More and more our attention is being directed toward the importance of early diagnosis, segregation, education and proper care. This is shown by our recent increase in tuburcular testing campaigns and efforts directed towards increaseing the hospital room to care for those that are ill. Prior to 1890 efforts directed toward furnishing sanitorium care was mostly done by private enterprise but in that year the Royal Commissions succeeded in proving to the Government authorities that the tuburcular problem should be of federal concern. However it was not until 1908 that the Local Government Board took their first step in a legislature enactment and recommended notification of pulmonary tuberculosis and in 1911 the notification of any type of this disease was made compulsory. In 1911 there was also provision made for sanatorium care for insured persons , a study of which proved the necessity of the system which embraced the tuberculosis dispensary which had special

trained doctors and nurses, health visitors, and residential institutions of the sanatarium and hospital type. In 1921 another health act was passed which made it obligatory for every county to make arrangements to ~~make arrangements~~ for all persons suffering from tuberculosis. Every year the amount spent on tuberculors has increased in 1914 approximately 373,000 pounds were utilized for this cause, in 1927 it had risen to 2,972,357 pounds. Regardless of this large amount of money spent there has never been adequate proper care for all of our tuberculosis patients. Many had to wait on the admitting list until they had exposed the entire family, some of their neighbors, and many died while waiting for an empty bed at the sanatorium.

At the present time in the state of Oregon we have enough room in The Dalles Sanitorium for 50 patients, 65 at Salem, and enough private sanatoriums to care for 50 patients and with the expectations of a new one in Portland large enough to accommodate 50 patients which will be sufficent to care for our 3,000 cases now listed unless this number raises.

In public health nurses' responsibilities in controling tuberculosis are many some of the most important are as follows:

1. All persons with open tuberculosis should be under sufficent controle to prevent the germs from spreading. Individuals evading detection should not be used as an excuse to disregard this ideal.

2. Proper nutritional food and rest is very important. Change of climate is probably not as important as formally thought unless it allows for more mental or physicial rest.

3. Babies must be carefully protected from exposure to infection until they are at least two years old and even then they have a very high susceptibility. It is almost sure death for a baby to nurse a mother who has an active case of tuberculosis, and it is also very bad for the mother. The baby must be removed from infectious cases regardless of cost.

4. Children between two and six should be protected from massive exposures and if possible from all exposures. Measels, whooping cough, colds and other infectious diseases should be avoided and physicial defects should be corrected. Good body resistance should be maintained by proper foods, fresh air, sunshine, rest, play and sleep.

5. Adults, especially young people should keep up their resistance by good nutrition, fresh air and sunshine, sleep and sanitary habits and if possible prevent infection, especially in large doses.

6. The general public should know of the early manifestations of tuberculosis and the advantage of seeking early medicial advise.

7. The most important factor that keeps tuberculosis with us is poverty which is the predisosing cause of poor food, bad air, depression, crowded home life, lack of the future and poor physicial morale. Born to poverty and the lack of hygiene, tuberculosis leads to poverty and lack of

hygiene. It is a vicious circle."

8. Poor housing is also a predispossing factor of tuberculosis. The houses become loaded with infections becilli which seems to be waiting for some child. Perhaps the bad housing condition which increased during the depression will give way to a mobility trend which might be free from this prevalent disease.

CEREBRO-SPINAL MENINGITIS

This disease has been known by a number of different names as spotted fever, brain fever, and by others that present similar symptoms. With the exception of infantile paralysis, it has some peculiarities of its own. It strikes here and there throughout the population, with apparently no reason, often quickly taking the strongest and healthiest of the young people. Often there is no way of discovering the source of infection as there is no history of exposure to the disease, while members of the family who have been severely exposed may never have the disease.

Meningitis is an infection of the meninges or lining of the brain and spinal cord. Like pneumonia, it may be caused by a number of different microbes. It may be a primary disease. In that case it is caused chiefly by the meningococcus; or it may be a secondary disease following typhoid fever, influenza, pneumonia, or middle ear infections. In these cases in which the infection is carried by the blood stream from the site of inflammation to the meninges there is high mortality rate. Epidemics of meningitis are almost always caused by the "diplococcus intracellularis meningitidis," which is the specific cause of cerebrospinal fever as differentiated from cerebro-spinal meningitis which may be caused by a number of organisms.

The meningococcus was first identified by Weichselbaum

in 1887. Like the pneumococcus they usually appear in pairs, although they occasionally appear in tetrads. The meningococcus resembles the gonococcus so closely that it is very difficult to tell them apart unless the source of infection is known.

The disease is very dangerous, having over a fifty percent mortality unless the diagnosis is made very early and immediate energetic treatment taken. Fortunately, the symptoms are severe enough to warrant immediate medical aid. In the ordinary form the disease set on suddenly with headache, severe chills, and vomiting with no relation to stomach contents. Fever runs from 101-102 F usually, and the number of lucocytis increases. The patient becomes restless and irritable and annoyed by unusual lights or noises. Pronounced psychic symptoms as delieium and erotic cries are present at first which give way to stupor, which in turn deepens into a coma. This disease may run a course from a few days to several months but more than half of the untreated cases die in the first five days.

The bacteriology laboratories seem more responsible for controlling the spread of meningitis. The mening--ococci--must be found in the spinal fluid early and serum given immediately. Cases in which serum is given within the first three days increases the patient's chance about fifty percent. In an experiment done by Flexner he concluded that 18.1% patients that were treated before the third day died; 27.12% died if treated between the fourth

and seventh day; and if the disease is not treated with serum at all he estimated the mortality rate would be 70%.

The presence of so many healthy carriers and the high immunity of the average individual makes this a very hard disease to deal with. The serum, if introduced to healthy individuals, produces an active immunity, but the cost of this procedure and the rareness of susceptible individuals does not warrant this undertaking, unless exposure is known, and at which time it is sometimes done. Adequate isolation technique to prevent the spread of known cases and carriers are about the only method of prevention used today.

DIPTHERIA

The earliest account of Diptheria is by Aretaeus who lived in the second century. At this early time he described ulcers of the tonsils and the white coating in the throat, and stated that if the disease or coating reached the windpipe it often caused suffocation. There is little trace of the history of the disease from Aretaeus' writings until Villa Real and Perez de Herra made their excellent historical contribution after studying the epidemics in Spain during 1583, 1630, and 1645. During this time the disease was called "morbus suffocans" or "garotillo" due to the suffocation which resulted when it spread to the larynx.

At this time most of the emphasis was placed on the distressing choaking characteristics of the disease. Along with that description Perez de Herrera described eight varieties or stages of throat affections. Villa Real gave a good description of the elasticity of the membrane and he stated that it was adherent to the fauces and throat from which it could be lifted.

In writing of an epidemic in Italy in 1620, Cortesius mentions the highly contagious and fatal characteristics of the disease.

Bretonneau of Tours (1778-1862) contributed the first good distinctive account of diptheria, and gave it the

name by which it is now known in his book called "La Diphtherite". In this book he identified diptheria as a specific contagious disease characterized by the presence of a membranous exudate which might invade the throat and pharynx or the air passage and larynx. He demonstrated that the condition, which was formerly called "Croup", was a form of diptheria when it attacks the larynx. He also differentiated between diptherial and other throat infection.

In 1883 Klebs described the bacelli present on diphtherial membrane when stained with methylene blue, but he did not succeed in making a pure culture.

Loeffler confirmed Klebs' findings and succeeded in making pure cultures of these bacilli, and carried out extensive series on animals. He published the results and findings of his experiments in 1884.

In 1890 von Behring discovered that horse serum that had been previously immunized against diptheria if given in proper concentrated form, conferred active immunity when injected into a guinea pig. In 1894 Roux and Martin[1] demonstrated the value of this specific treatment as a preventative measure for human beings. He published a paper showing the result of his treatment with the use of antitoxin on 300 children suffering from this dreaded disease.

By 1913, Schick of Vienna discovered the value of the

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[1]Annales de l'Institute Pasteur, 1894 (8) 640.

skin reaction test after the injection of toxin to prove whether people were immune or not. At first the unaltered toxin was given to produce active immunity, but in many cases it proved dangerous.

In 1923, Ramon, a bacteriologist at the Pasteur Institute, worked out a plan whereby the diptheria toxin was weakened by a formaldehyde treatment to such an extent that it was safe to administer and still effective. He called this treated toxin "anatoxin" or toxoid, and ever since it has been given as a specific for typhoid.

Due to the discovery of the specific for this disease we are now able to say with assurance that we understand the disease well enough to entirely eradicate it within a few months if the public would cooperate, and if the necessary funds were availible.

Diptheria is perhaps the best understood of all the contagious diseases and the accomplishments that have been made that would enable us to entirely control this disease are as follows:

1. The germ can easily be recognized under the microscope.
2. The germ can be studied and cultivated in a tube for diagnosis.
3. It can easily be studied for virulence.
4. Its manner in which it transmitts itself is well understood.
5. The manner in which it produces the disease is

sufficiently understood.

6. Immunity may be determined by the Sheck test.

7. Antitoxin may be administered to give a quick immunity.

8. Toxin-antitoxin injections will produce a permanent immunity.

9. Antitoxin is of considerable value as a treatment.

10. The disease could be ableyy stamped out by compulsory toxin-antitoxin treatments.

Carriers may be detected and cured of their condition.

However, this would not be necessary if we had compulsory toxoid treatments.

The germ which causes diptheria grows locally in the throat, nose, and sometimes a wound producing a poisonous substance called toxin. The toxin is absorbed by the body and causes distressing symptoms which progressively grow worse, and unless the body is able to make an antidote for this poison, the patient will die unless treated. As the germ grows in the outer layers of the infected area of the mucus membrane the tissues are killed and turn a grayish or yellowish white. This is known as the "Membrane" and is a characteristic feature of this disease. If the membrane forms over the air passage the disease becomes known as "Membranous Croup" in which there is considerable danger that the swelling may cause an obstruction for which emergency trachectomies must be performed.

The diptheria bacillus is spread from one person to another by discharges from nose and mouth and through indirect contact by fomites which have been recently contaminated by saliva. Any one who has been in contact with the disease or has had it may become a carrier and expose many people or contaminate food stuffs, and at which time the disease may break out in the form of a large epidemic. Cats or any household pet may occasionally become carriers.

The manner of producing antitoxin is very facinating. The diptheria bacillus is grown in appropriate culture medium, the germs are separated from the liquid, and the poison is measured in strength and volume. Small doses is given healthy horses and in a few days a larger dose is given. This process is continued until the horse is able to stand enormous doses of the poison due to the large amounts of antitoxin they have developed. At first the doses makes the horses slightly ill but they soon recover and by the time the last doses are given they feel real well. A part of the blood then drawn and allowed to clot. The serum is then concentrated and tested for purity and strength. It is then put into syringes ready for use. In a few cases a person gets an unfavorable reaction to antitoxin because it contains some horse serum which is poisonous to a few people, but rarely couses much loss of time. Every batch of antitoxin is checked by the laboratory of the United States government before it is put on the market. Much of the criticism that has been commonly given to the treatment

was really destructive work done by the disease before antitoxin was administered.

Diptheria is a disease which is far much better to prevent than to have to cure because the disease can do considerable harm in a very short time. If a child who is susceptible has been exposed he may be given a small dose of antitoxin, administered for treatment, to immunize him for a week or so. This type of immunity acts as soon as it is absorbed by the body. It is only good for a few days as it is excreted by the body, and if permanent immunity is desired, it must be given by at least three injections of the poison and the antitoxin. The poison is neutralized enough so that the reaction is very seldom severe enough to cause any loss of time. The purpose of the injection is to stimulate the body to make its own antitoxin. It requires from several weeks to six months for this immunity to develop. It may take more than three months, but after immunity is developed, it is thought to last a life time, although people who are around the disease are advised to check this immunity after five or six years.

The Sheck test is used in diptheria to test the susceptibility of an individual, which consists of injection of one-fourth of the amount of toxin necessary to kill a guines pig into theskin. If the individual has enough antitoxin in his system to protect himself against the disease, it will be neutralized and will leave no trace. On the other hand, if the dose shows that he does not have enough anti-

toxin to make him immune, the toxin will irritate the skin and a red spot will appear at the site of the injection. If the person has a positive reaction he should be immunized by the method that seems appropriate according to the amount of time available. If the Sheck test is given alone it does not produce any immunity. Sometimes it is given with a large dose of toxin to produce temporary immunity providing the patient should test positive. It also is sometimes given with the first dose of toxin-antitoxin. Mixing the doses is very valuable (itwould make about one-half of the children immune) in cases where the procedure would not be carried out.

Susceptibility correlates very closely with the age level. Most adults are immune, perhaps from getting enough diptheria germs to stimulate the production of anti-toxin, but not enough to cause the disease. Most babies under six months of age are also immune, having taken the anti-toxin from their mothers. Nearly all children between seven months and under two years are susceptible, and as a child grows older he becomes more and more immune. By the time they reach adolescence about one-half or two-thirds are immune. Due to the very high percent of positive reactions, most physicians immunize, as a matter of course, children under nine years of age. Six months after the three injections toxin-antitoxin the Scheck should be given.

In preventing this disease isolation technique should be carried out on the known cases and throat cultures taken

of those exposed, as well as the administration of toxin before mentioned. It is usually better to keep the school open and watch the children than to close the school. However, that will depend upon the school board and health officers.

The actual germ must be present to cause diptheria, but anything that lowers the body resistence may decrease its ability to stimulate the production of toxin. The most common predisposing causes are defective adenoids, tonsils, malnutrition, damp rooms, poor health habits, and lowered resistence due to some other disease.

DISEASES OF DIGESTIVE TRACT

"Filth Borne Diseases"

Typhoid

There are few diseases that show as much contrast of the pastwith the present as ~~to~~ the number of cases and details as does typhoid fever. Fairly young people, and all the aged, can remember being afraid of this terrible plague that persisted in some localities almost all year around with no hopes for recovering if you were choses for its victim.

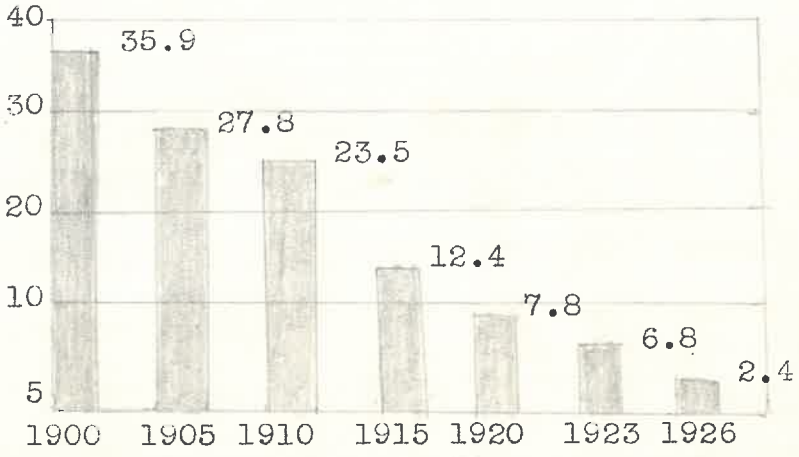
Hippocrates mentions a disease characterized by symptoms of a continuous fever, watery stool, red rash, epistaxis, delirium, abdominal pain, and great loss of flesh, which we now believe was typhoid fever. In 1624, Spigelius describes febris simitertiana, prevalent in Italy, of which symptoms noted were: diarrhoea and sometimes with melaena, abdominal pains, prolonged fever with irregular remissions, and in which cases post mortem revealed lesions of the small and large intestines. Bretonneau who was a physician, contributed a scientific description of typhoid that distinguished it from Typhus, the work formerly studied by Willis and Syndenham Bretonneau (1815-1838). He also stated that typhoid was always accompanied by characteristics lesions in the patches of lymphoid tissues, and that the disease

was caused by a poison which was contracted from a person suffering with the disease. Louis of Paris and Girhard and Pennock of Philadelphia, all of whom had studied typhoid fever during epidemics, contributed material in differentiating typhoid from typhus, but it was not proven until 1849-51 by Sir William Jenners who analyzed the cases admitted to the London Fever Hospital for 2 years. He demonstrated and proved at this time (1851) that the eatiology of the 2 diseases were different and that one did not communicate or protect against the other and that the two diseases did not necessarily occur at the same time. He confirmed his views by the results revealed from many post-mortem examinations.

Eberth, in 1880, identified the specific bacillus in the spleen of a number of his patients who died of typhoid, but was unable to succeed in making a culture of the organism. Gaffky succeeded in isolating the bacillus and in growing a pure culture on a sterile potato in 1884.

In 1896 Gruber and Durhan showed the agglutinating action of the serum of patients suffering from typhoid on the typhoid bacillus and its value as a clinical test and three months later it became known as the Widal Test, which aids in early diagnosis and scientific prevention, due to accurate diagnosis. The active immunization of man against typhoid fever was described by A. E. Wright in that same year.

During these 336 years in which many scientists were contributing to the history and cause of typhoid many lives were being lost annually. In some districts 150 death rate per 100,000 population was not uncommon. Even as late as 1910 there were 25,000 deaths reported in the U. S. alone from this purely preventable disease.



Typhoid death rate for the U. S. Registration Area

The typhoid bacillus is of average size having to be magnified 500 to 1,000 times. It reproduces at a tremendious speed when under favorable conditions--one germ when in warm milk may produce millions within 24 hours. They contain numerous flagella which makes their mobility rate very rapid. These germs are only to be found in things contaminated with human excrement, and it must be taken in by the mouth in order to take the disease, making the disease a filth born disease which is a disgrace to any locality. The typhoid bacillus for the main part is not very resistant. They may live for several weeks in some foods, or lay dormant for months in cold storage food, or

in ice made from contaminated water, but if they are exposed to sun or heat they readily die and they can stand drying only for a very short time.

Formerly typhoid has travelled through two distinct channels; water and milk which had previously been contaminated by a person having the disease or a carrier.

Water born epidemics more often occur in the spring during thaws when the ice and snow is draining from the low places almost directly into the streams which are still too often sources of drinking water. A water system that is too mear the sewage is also very dangerous even though both tanks are supposed to be water proof, often that knowledge is more harmful than good, as it gives a false sense of security as did the notorious well of Wall Street.

Even though the cases of typhoid caused by water have decreased to an appauling extent there is still much to be done in educating the public about the ways of maintaining and the value of uncontaminated water in order to curtale these entirely preventable diseases. This includes a slow process which in this state and in most of the others have been fairly well accomplished.

In the last few years there have been more cases resulting from contaminated milk than from water perhaps because it is easier to secure pure water than milk, due to the amount of handling necessary for the latter and partially due to the fact that in the past water was discussed in connection with filth more than milk. Typhoid occurring

from contaminated milk is more often of a milder form with a shorter incubation period. The source of infection in milk born epidemics are usually easier found than that of water as it effects all susceptable milk consumers alike with no exception to sanitary habits.

In a few instances food has been known to carry the typhoid bacillus in cases when the food was grown in contaminated soil, or contaminated by flies, water, carriers. Food that is handled after it is cooked or oysters grown in sewage contaminated beds are the best examples of this.

In controlling typhoid fever stress must be placed upon sanitary measures. Especially those dealing with proper sewage disposal, water and food inspection, health examinations for food handlers and perhaps at the present time, most of all the distruction of flies. For this maintenance of life a fly requires two kinds of food: (1) a soluable protien substance which he gets from toilets, (2) a soluable sweet which he loves to get from the sugar bowl. This natural craving makes him an excellent intermittant carrier of typhoid. In caring for a typhoid patient, means of prevention should be understood by everyone caring for the patient. It is usually so difficult to teach a lay person typhoid isolation technique in such a short time that it is deamed necessary by most authorities to either hospitalize the case or hire efficient graduate nurses. Continuous disinfection of everything that leaves the sick room must be done with special attention to the excreta which is disinfected by 10% carbolic acid or 5% formalin added in equal

proportions with the amount of excreta and allowed to stand from 2 to 3 hours. One of the hardest things to combat in preventative measures is the typhoid carrier, as he has no outward signs of harboring this germ and usually before he is suspecting the disease has spread considerably. The problem is further complicated by the fact that negative tests are not conclusive and that for the main part, methods used in freeing the carrier have failed, although various methods as cholestectomies, injection of typhoid vaccines, administration ofintestinal antiseptics have been tried.

In addition to the public responsibilities which to a very large extent is placed upon the contaminated individual, the vaccination offers a personal method of approach in which prevention does not depend so largely upon some one else. The value of vaccinations is easily seen in a comparison of the number of typhoid cases in the World War, where vaccination of soldiers was compulsory and the disease was almost nil, with that of the Spanish American War where about one man in every five had the disease and a great many died. It is considered especially valuable for people who come in contact with people who might be carriers or from filthy places such as sailors, doctors, nurses, and campers or travelers. The immunity produced is not absolute immunity, therefore to be safe one should be vaccinated every three years if frequently exposed to

the disease. Under no consideration should vaccination take the place of sanitary living when it is possible because the latter not only helps and protects against this disease but most of the other contageous diseases to some extent.

In controlling epidemics it is necessary to make an early diagnosis and isolate the patient. All means of carrying the typhoid germ should be investigated. Water and milk supplies should be tested and analyzed. A careful case history often aids infinding the source of infection. The public in that vicinity should know of the case and be made familiar with ways of prevention and vaccinations made possible for everyone.

Asiatic Cholera

Asiatic Cholera is said to have originated and, ever since, existed in the delta of the Ganges River where sanitary conditions have always been very poor. From 1902 to 1911 approximately 4,000,000 persons died from this disease alone, the larger percent being uncleans. In the nineteenth century cholera was spread to the various parts of the world by traders.

Unlike most contageous diseases cholera has never been known to be carried except in man's body. It has followed the lines of human travel on foot, on horse, by stage or ox team, on steamer or on train. The effected people sick and dying have carried it around the world.

There has been four large epidemics of cholera in the United States, in this century, the first occurring in 1848, and the last in 1902 and since that time the disease has been of little consequence except in India.

Perhaps the first epidemic from which much was learned was from the well known Broad Street Pump epidemic of London in 1854. The credit of finding the cholera bacillus was won by Dr. John Snow who was at first rudely ridiculed. His theory or conclusion was treated as an excellent joke. The idea of this fine flavored water causing cholera was preposterous. However a slight social study on those using this water was enough to prove that this delicious water was highly contaminated with human feaces.

The Hamburg epidemic of cholera in 1892 is another

interesting epidemic caused by contaminated water, although it was not so difficult to prove the cause and check the disease. In this epidemic the city of Hamburg, which is located above Altona, used unpurified water from the Elbe River and had a death rate of 134.4 per thousand from cholera. Altona also used the Elbe River plus the sewage of Hamburg, but rendered it safe by filteration and their death rate from cholera was 23.0 and most of these cases gave a history of having worked or visited in Hamburg.

Robert Koch discovered the germ of cholera in 1883 and proved that it was present in large numbers in the intestines of every person suffering from cholera. In every case of cholera, as in typhoid there has been a rather direct connection between the excreta of one person and the digestive tract of another, thus placing this disease to a large percent as a sanitary problem.

It is very doubtful if we will ever have to consider cholera as a very serious problem again, except in very unsanitary places, since the germ and its manner of transmission are so well understood and most civilized localities have too high living standards to permit its transmission. Clean, pure drinking water, clean or cooked food, clean hands, suppression of flies, proper disposal of excrement and sewage, isolation of cases, and control of carriers are the main measures which assure us of safety from cholera epidemics.

VENEREAL DISEASE

Syphilis

Syphilis is an infectious disease of profound social and financial significance, with a history that should be of interest to every individual. Records have been found that have lead many students to believe that this disease is of Asiatic antiquity. However, there is considerable doubt as to the origin of syphilis, but until recently the consensus of opinion was that Columbus discovered more than a new land on his first voyage to Haiti, as the inhabitants of Barcelona became infected with syphilis soon after his return. The disease spread to Italy in 1493 and from them Charles VIII army with many Spanish mercenaries contracted the disease. Syphilis swept through Italy in the form of a fatal epidemic. In 1530 syphilis appeared for the first time in a poem written by Fracastoro, "Syphilis" being the name of the infected hero. Civilization is syphilization.

Of all diseases syphilis seems to be the most loathsome and vicious, yet it begins unauspiciously enough as a small lesion called a "chancre". Commencing as a small red papule gradually enlarging to the size of a pea at which time it begins to ulcerate. The edges become hard and then the ulcer begins to granulate and may heal with or without

treatment sometimes leaving a small scar. The most prevalent site for the initial lesion is on the genitalis and it is often assumed that it is altogether a veneréal disease resulting directly from sexual intercourse with infected individuals--thus making the eradication of this disease very difficult. Even though this is perhaps one of the most common ways of transmission, it may also first occur on fingers, lips and nupples as a result of sexual perversions with syphilitics and this is certainly not always true. People who associate with syphilitic patients sometimes contract the disease innocently by using the same fomites or a nurse or doctor may also become infected during certain procedures. Many children who are born of syphilitic parents are infected before or during birth and thus become the improperly named heréditary case of syphilis.

Syphilis runs a general course going through four stages characterized as follows: (1) PRIMARY STAGE occurs first within a month from the time of exposure of infection. An ulcer or chancre develops. The walls usually becom hard and indurated. During the first six to twelve weeks following the original infection no other particular impairment of health is noted. (2) About five to six weeks after the chancre occurs the secondary stage occurs which is characterized by a slight rash of coppery tint which does not itch and disappears without treatment and is often overlooked. Other manifestations are sore throat with small gray ulcers in the tonsils and a glat gray area on the mucous membrane

of the throat called "mucous patches". The lymph glands become swollen; the joints may ache and the eyes become congested; the ahir losses its gloss and may fall out. Fever and anaemia may or may not follow. The secondary stage has no definite time limit but it may last as long as two years. (3) The tertiary stage or usually the last stage is recognized by a chronic inflammation of the cellular tissues, an inflammation which may be diffused, as in the liver, or localized as a gumma. The gumma develops very rapidly in the form of a painless swelling which very soon softens, ruptures and discharges its contents resulting in an ulcer. The gumma may appear any where in the body, and when it is fully developed it is a circular ulcer with steep walls and an infiltrated base. When located in bones or important internal organs it may lead to terrible disfiguration of lasting nature or an impairment of vital functions.

In a very small percent of syphilitic cases a fourth stage occurs called quaternary stage--Tabes dorsalis (or locomotor ataxia) and general paralysis or brain degeneration causing insanity. The first is a chronic condition due to the presence of syphilitic germs in the spinal cord; while general paralysis or paresis is a well known mental disease, which if not properly treated lead to a very pitiful end.

All the symptoms except the primary stage can be seen in the congenital cases which is no doubt the most pitiful

case of all. To bring children into this world which upon landing are meet. By such infections of the teeth, chin, forehead, ears, nose and bone disfiguration is a disgrace to all humanity. These children grow and develop very slowly and are shamefully stigmatized but fortunately they seldom live over three years.

Syphilis has been a real problem since 1493, the cause remaining unknown for 400 years (1905) when Schaudinn and Hoffman discovered in the effected tissue the Spirochaeta pallida or treponema pallidum. This microbe is described when stained upon a dark field by Zinsser as "rotating about the long axis" with a backward and forward gliding movement, and occasionally bending the entire body. The ends of the micro-organism comes to a tapering point. The organism is very hard to stain and to cultivate in the labratory. The spirochaeta pallida which is the cause of paresis is the most difficult to cultivate. Naguchi worked out a satisfactory method by placing an inoculated rabbit kidney in a test tube of ascitic fluid and excluding the air by oil. The spirochaetes grow forming a cloudy appearance in this mixture but looses its verulence very soon. The spirochaeta pallida as well as the treponema pallidum is found in the primary or initial lesion, the chancre, and mucous patches and in the secondary stage of the disease in the brain and spinal cord, and in rare cases it is found in the gummas or skin eruptions.

Diagnosis depends chiefly upon labratory reports of Wasserman reaction and the Kahn test on blood or spinal fluid, however, skin changes are also very important. Wasserman test alone is insufficient basis for a negative diagnosis and clinic findings when negative should also be repeated due to the disagreement of different labratory technicians.

Syphilis is a preventable disease. It is believed that advanced cases of paralysis would never occur if syphilis cases were given early treatment. It is impossible to prohibit the instincts of man but there are measures which can be employed to safeguard the individual and society against syphilis. No doubt the first is educating the public to personal hygiene which should include continence, or if failing that, immediate prophylaxis after exposure.

One means of control includes inspection ,segregation and compulsory registration of veneréal disease and educating the public of the necessity of treatment and making the same available for everyone.

In the past society has suggested certain things to the public which more or less became a daring line. The medical profession aims to subject every newlywed to a complete blood examination before the licenses are issued but the legislators have hesitated to add this law to their status books, even though it is very evident that it would be more beneficial to mankind and save more lives and money than any number of other laws. It seems that the time for the

for the traditional attitude of secrecy concerning venereal disease will give way to sufficient knowledge to prevent syphilis and at least Spirochael pallida.

Opposing the former popular belief, syphilis has been proven preventable and curable, especially in the early stage. In 1910, Ehrlich tried six hundred and five compounds for the treatment which had proven useless before he discovered arsphenamine, or solversan, commonly called "606". Neo-arsphenamene or neosalversab "914" is a further improvement. Both these two treatments depend on the content of the arsenic to check the spirochates. Iodides and mercury shouldalso be used in this treatment.

Dr. John H. Stokes and Dr. Parran[1] after studying a world wide survey by a League of Nation Commission and U. S. Public Health Service in cooperation with the group of Americial Clinic authorities, concluded that syphilis should be treated in either one of two ways: the American "continuous" or the Danish-British "Intermittent". Both ways specifies very definitely the dosage of the essential drug, the time, and the necessary test. Arpphenamine (refinement of 606) and bismuth are used in alternate doses for a period of about 65 weeks. The arsphenamines after liquifying is injected slowly into the blood stream through a vein which carries it to the infected part. Bismuth is given to displace

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[1]Dr. Parran (Surgeon General U. S. Public Health Service) the Readers Digest, March 1937, Page 9.

the poisonous effect of accumulated dossage of mercury poison. The principle is to introduce enough poison to kill the germ without too much damageto the surrounding tissues. Ehrlich discovered that the spirochaela was very succeptible to arsenic, hence it was termed the "spacific"for syphilis. The sites most commonly used for injection is some prominent vein, hip muscle, and less frequently, spinal and subculaneous injections are given.

Antisyphilitic treatment must be started early and carried out religiously because procrastination lowers the chances of cure and increases the length of time and amount of medicine necessary. Do. H. Stokes states that more time should be spent in teaching the patient the value of long continuous treatments and securing their cooperation for the same before beginning the treatment. Most Doctors discourage pregnency until a year has elapsed since the last symptoms. However, Dr. Parren states that 95% of children born of mothers who have been treated for six months, are safe and that in many cases it helps clear up many cases of infection in parents.

General paralysis develops in about five percent of syphalitic patients, usually accruing between the ages of forty or fifty;males are more commonly effected than women and married people are effected more than single ones; and it seems to occur more among urban dwellers and especially those indulging in alchohol and intensive night life.

Malaria theraphy seems to be the most effective treatment for general paralysis, Salversan and neosalversan proving of very little nor no value at all. Malaria theraphy does not restore the brain sell but merely checks the train of destruction. This treatment was marked out by Wagner von Jauregg in 1927. Malaria theraphy is given by enoculating the paralytic with blood from a malaria patient. Within seven days he develops a benign tertian malaria with characterized chills preceded by fever. After about ten good chills have occurred, they are checked by quinine and with the result about one-third to one-half of the cases are freed from syphilis to leave their dream land of millions to resume their previous business-like existence if the treatment is given before too much disturbance has actually occurred.

General paralysis only occurs after a syphilitic infection. This leads us to believe that educating the general public seems to be the best way of prevention.

MEANS BY WHICH TRANSMISSIBLE DISEASES ARE CONTROLLED

Vital Statistics

Too often vital statistics are considered a dry and uninteresting piece of foolishness, and many times when they are used as a means of getting something done, with little thought of accuracy they are useless. But if they are properly kept and interpreted they are the most vital means we have of determining the needs of the community. The Health Department, like any business concern, must have records to measure the present with the past; to check upon their various activities; health authorities are liable to determine what fields are mostly in need of increased health work, and what fields are most effectively operating. Statistics are also very useful to prove the need for more health workers or the value of certain control methods such as vaccinations, toxoids, etc.

If statistics are to be used, they must be taken from a large enough number to represent a true picture of the situation. In collecting statistics for deaths caused from a certain disease the mistake is sometimes made of taking the area where a hospital that takes patients for miles around is located. Therefore the cases appearing in that locality would be misrepresented. An

excellent example of this is shown from the mortality rate of tuberculosis in Colorado and Arizona, both of which are extremely high and would give an incorrect impression unless the number of people that go there after they have the disease is known. Also, the actual cause of death is sometimes misrepresented by a more pleasand sounding word as a man dying of syphillis may be said to have died of cardiac condition. To obtain the true facts the record of the entire community should be taken and classified on the percentage population of 100,000. For instance, in a county of 2,500,000 population with 100 deaths of measles the computations would be as follows:

$$\frac{\text{Number of Deaths}}{\text{Population}} \times 100{,}000 = \frac{100 \times 100{,}000}{2{,}500{,}000} = 4.0$$

Death rates and in some states infant mortality rates are computed on a basis of 1,000.

Graphs are often used to bring out facts and give a more lasting impression than just an outline. However, graphs are sometimes misrepresented by changing the relative value of the perpendicular and the horizontal units of measurement which would change the curve of the course in relative proportions by making it very steep or very flat. In this way one can make a particular graph appear more or less as may be desired. Other ways commonly used to mislead the public are, for instance, cutting the bottom off the graph, or by representing the height of a

line by the figure of a man or some other object.

If graphs are properly used and comply with the general expectations of the public they are very instructive and educational. They tell the story of progress clearer than any other known method.

Segregation, Isolation and Quarantine

It is very difficult to state with any accuracy when isolation and quarantine were first practiced. The Mosaic code makes very definite provision for setting certain persons, particularly lepers, aside from the general population. In early days, when bacteria was not understood, the inhabitants of the villages attempted to protect themselves from diseases in much the same manner as they did from their feared neighbors. They built walls around the settlement, as the walled cities of ancient times, the moated castles, or the great wall of China. Some of these walls were built to keep out their enemies but they were also built to keep out people with diseases. At this early age quarantine was used to shut out everything for a certain length of time until it was supposed that the danger was past. The word "quarantine" comes from the Italian word meaning 40 (quaranta) forty days being the time that it took during the middle ages for ships coming from parts where plague was raging to be detained before they were allowed to land. In later years it became known as the amount of time well people, who are exposed, or possibly exposed, are kept from associating

with other people; this time corresponds to the incubation period of the particular disease to which they were exposed.

As our knowledge concerning diseases increased our methods of quarantine changed considerably. Quarantine restrictions should not seek to serve as a dam, but as a sort of sieve allowing most of the things capable of transmitting the infection. We can quarantine a house with yellow fever most effectively by preventing mosquitoes from coming and going or a house with bubonic plague by preventing rats from journeying back and forth, and if we were quarantining against typhoid fever we should place the stress on things containing contaminated bodily discharges. The length of quarantine should not be set as 40 days but should be related to the incubation period of the disease.

Often quarantine is a very imperfect means of eliminating transmissible disease. It often counteracts itself in that persons that are slightly ill often will not report themselves for fear they will be quarantined, and expose many people before they are found or sometimes even before they realize that they have the disease.

Quarantine often leads to a false sense of security. Some time people who know that there is a case of small pox, think that since the case is in quarantine they need not go to the trouble, cost and bother of being vaccinated. Quarantine not only causes the detention of persons who are not ill, but it also often causes

considerable inconvenience and friction.

With increasing knowledge of the laws of epidemiology, quarantine is becoming less strict as far as the well members of the family are concerned. Sanitation and islation to a large extent istaking the place of quarantine aswe have modified our ways from building a wall to keep infection out to cleaning up the source of the infection.

Isolation which means segregating the ill patients from the well is much less criticized than quarantine. Isolation allows the well persons to come and go and protects the members of the family as well as the community from the disease if it is properly carried on. However, in large crowded families it requires considerable ingenuity to properly isolate a patient. it is very dangerous to trust isolation when the rest of the family was exposed before the case was diagnosed. The method of islation varies with the different diseases according to the way in which the disease is spread.

The room to be chosen for the isolation should be chosen with much care. It used to be thought that the patient should be upstairs in a far corner away from the rest of thefamily, but many doctors now believe that the patient should be close to the bath room and kitchen so infected linen and dishes will not have to be carried so far. However, an intelligent person could be taught to carry out good isolation technique at either place and perhaps it would be more important to stress the difference in the amount of work which would be involved, especially when an already busy mother is taking care of the case.

The room should be comfortable, airy and sanitary, and free from carpets, rugs, curtains and all excess furniture that is not necessary for the welfare and comfort of the patient and the one caring for the patient. Things left in the room should be as far as possible those which will stand washing, cleaning or can be Burned. The sick room should be warm and in most cases light. Strict isolation technique, regarding dishes, linen and discharges should be as thoroughly carried out at homes as in the hospitals. Only the one caring for the patient and the physician should enter the sick room. In case the mother or someone who is not acquainted with the disease is caring for the patients the reasons and ways of carrying out isolation technique should be explained and demonstrated until she understands it. The attendant should also be made familiar with the general course of the disease and the most common complications.

In case the mother is caring for the patient she should avoid as much contact with the rest of the family as possible and she should not help with the cooking for the rest of the family.

If it is impossible to carry out good isolation technique in the home the patient should be taken to the hospital.

Children should not be allowed to attend school or mingle with other children when they are suffering with any thing that might be contagious. They should be sent home if they have any symptoms of sore throat, headache or marked cough while at school. During epidemics it is usually better to keep the school open and keep out the ill because children in school are usually better controlled than they would be if they were permitted to go home. Frequent careful

inspection is doubly essential during epidemics and theaters churches and the various places of entertainment should be closed especially for children, because usually the younger the children are, the lower their resistance and the higher their susceptibility to communicable diseases.

Fumigation and Disinfection

Fumigation is a process by which fumes or gases are liberated for the purpose of destroying the germs of disease insects, vermin, rats or such other living things as might be capable of carrying infection or causing a disturbance. The procedure as a rule is very impressive, sometimes even spectacular, and so is thought to be highly effective. A few years ago this method was used to a large extent after any kind of contagious disease. Some health rules required people to fumigate the room which the sick patient occupied before they could be released from quarantine. Unfortunately this impressive procedure is not as effective as it was once thought, or is still though to be by some people. Too many times it gives a false sense of security and takes the place of proper cleaning.

To rid a home of insects, vermin, rats, or other small animals fumigation by the means of burning sulphur or by the release of prussic acid gas (hydrocyanic acid gas) is very effective, but formaldehyd fumigation as a means of making house or room safe after a case of scarlet fever, chicken pox or any other similar disease has a far greater psychic than sanitary effect. Some of the germs are in the cracks, in the sputem and bedding where the gas is unable to penetrate and surface disinfection is the only thing that can be assured

from such a procedure.

Formaldehyde fumigation is one of the most common ways of disinfecting but this gas will not kill insect life and will only kill germs affectively when they are directly exposed (to the gas), when the room is warm (65 degrees Farenheit or above) and contains moisture in the air. The most common way in which the gas is liberated is by the use of candles, the number depending upon the size of the room (enough to equal one pint of formalin and one-half pound of the permanganate per 1,000 cubic feet of air space). The permanganate candles are put into a pail and then the pail is set in a tub containing a few inches of water. After all the windows are securely fastened the candles are lighted and the room closed tightly. This room should be left for at least twenty hours before using it.

Sulphur dioxide gas is used to fumigate, however, it has very little effect on the germs and is very destructive to nearly all the contents of the room. It is very effective, however, in the eradication of insects and other animal life. In fumigating with sulphur candles the room must be securely fastened or the gas will leak out almost as fast as it is liberated. Sulphur powder may be used if placed in a dry pan and then set in a tub of H_2O in the same method as the formaldehyde candles. The room should not be opened for two or three days.

Hydrocyanic acid gas is highly effective in the destruction of insect and animal life but has very little germicidal action. This is an extremely poisonous gas that should only be used by one who is familiar with it.

Bichloride of mercury is a convenient cheap disinfectant; it comes in the tablet form but must be dissolved before using and is highly effective when properly diluted and used. It is very poisonous, corrodes metals, is of very little value in the presence of albuminous substance, and it penetrates very poorly.

Phenol (carbolic acid) is a cheap, convenient very irritating poisonous liquid with a very disagreeable odor. it penetrates very readily and should be watched very closely if it comes in contact with the body in any degree because of highly irritating effect on the kidneys. It is often hard to dissolve in water as it has a tendency to remain globular or separate out at which time it might be very harmful.

Lysol is a soap solution with a similar action to phenol only it is much less powerful.

Hydrogen Peroxide is a very poor disinfectant, but it has a very good cleaning effect when poured in dirty wounds.

Tincture of iodine is very valuable as a skin disinfectant; it may be used to prepare the skin for surgery as it may be put in infected wounds, however, when it is put in a wound it usually requies more time for the wound to heal.

Mercurochrome is also put into wounds. It has a good penetrating effect but is rather poor germicidal.

Alcohol is a rather poor disinfectant, but one of the best cleaning agents as it dissolves many forms of dirt and grease.

Chloride of Lime is a very good disinfecting agent for body discharges and making water safe to drink if used in proper proportions.

Formalin is a cheap and convenient method if used in 5 to 10% solution to disinfect body discharges, linens and other articles that are not injured by washing.

Slaked Lime is very good to put on dead bodies or over excrement which is exposed to the air.

Soap has very little antiseptic action but it carries away more germs than all the other agents. If properly applied it removes dirt which contains the germs. Modern sanitary science is largely based on cleanliness and cleanliness depends mostly on soap and water.

Some authors consider earth one of our most valuable methods in the fight against diseases. Natural earth unless recently contaminated is thought to contain many germs that destroy filfth and disease producing germs. In the purification of water by passing through earth makes use of this theory , because if the earth retained all the germs it filtered out, it would soon become contaminated. This theory is slightly contradicted by Dr. Rice's statement that Tubercular Bacilli can live in the moist earth for 25 years.

Disinfection has been divided into two phases concurrent and terminal. Concurrent is the method used in making safe of discharges, linen, dishes and such things as they leave the sick room. Terminal disinfection has to do with disinfection of the room, bedding and other furniture in the room af-

ter recovery or the death of a patient.

There has been from time unknown a public feeling that if the corpse died of an infectious disease it is highly infectious. Some States still require that the body be cremated or buried in a sealed, lead-lined casket. Unless the corpse is kissed or fondled the least dangerous person at the funeral is the deceased body. The danger at funerals lies not in the presence of the dead, but by those who associated with the disease before the patient was enbalmed.

Many times the laity are confused as to what disinfectant to use for particular things and this to a large extent is the public health nurses work. She should educate the public to some of the most used disinfectants and the ones necessary in order to eradicate some of our most common diseases, such as sputum (5% Phenol left for 24 hours); excrement (10% Formalin for 4 hours); Linen (1:5000 Bichloride Solution in patient's room and then removed and boiled; bath-water (2% Formalin Solution). It should also be impressed upon the public that rooms are made safe by cleaning and fresh air and not by fumigating and papering.

Sanitation in Relation to Epidemic Diseases

It is very essential in order to prevent infectious diseases that we are able to procure pure water, clean food, and milk, and that the various wastes incidental to human existence be disposed of in a way that will prevent them from becoming a menace to the health of others.

In early times when habitation was so scattered this was not a serious problem, but the formation of villages

and cities made it one of the most apalling problems of the Middle Ages and it has existed in some places, insome forms, to the present date.

Water itself is a cleaning agent but when contaminated it has been known to cause more deaths than any other known source. It is very essential that water, and especially drinking water, should be as free as possible from filth. It it is necessary to use dirty water, it should be made safe by the various methods of Precipitation, Sedimentation, Filtration, Chlorination and Boiling. The expense of making it safe is far less than the expense of doctors and funeral bills.

Milk is another very famous source of infection. Milk which is considered the most perfect food of all and which constitutes from 15 to 18% of the American diet, can also be one of the best ways of transmitting infectious diseases, or causing epidemics if the milk is contaminated with the infectious bacillus, because it is an ample culture. Diseases transmitted from milk are: Typhoid Fever, Para-Typhoid, Dysentery, Diphtheria, Septic Sore Throat and Tuberculosis (both human and bovine). The fact that milk is so beneficial makes it worthwhile to bend our efforts toward securing good clean milk for our citizens and especially for the babies. People should be educated to the point where they will demand good clean pasteurized milk, from healthy well-nourished cows, and produced under the best possible sanitary conditions. All dairies should be made to meet the Health standard in regard to cleanliness and health examina-

tions of their employees at all times.

Before the passage of Pure Food Laws in the first of the 19th Century, almost anything could be sold for food of which the noted "Strawberry Jam" is a good example. This was a synthetic mixture of which the base consisted of a Gelatine mixture, colored with an aniline dye, flavored with a synthetic Coal Tar product, sweetened with Saccharine, made tart with Tartaric Acid, preserved with Benzoate of Soda and made realistic with clover and Weed Seed and shreds of cellulose to represent the seeds and cores of the berries, and this was labelled as the genuine product and put on the market on a competitive basis.

In 1906 the Pure Food and Drug Act was passed, requiring that any food from which any of the food value was removed, or any coloring or water added, must have the same stated on the label. While this law has not entirely stopped the attempt to disguise inferior food, it has improved the food situation tremendously.

If the City is going to have good sanitary regulations, and be as free as possible from flies, it must provide a good method of collecting sewage, and a method of disposing of sewage which meets the approval of the Sanitary Inspector. If the garbage is sold for pig feed it should also be kept in containers that are approved by the Inspector. If the dry garbage is wrapped in paper and then put in a closed garbage can, it usually is a more sanitary procedure.

There are many other sanitary problems in every community. Usually they are of local consideration and vary considerably in the different communities. Good sanitary conditions increase the self-respect and esteem of the inhabitants, helps them guard against contagious diseases and sometimes raise the value of their property.

Public Health Program
In Preventative Disease Control

The conquest of infectious diseases is at once an achievement and a hope. It is an achievement in certain diseases but just a hope in others. Bacteriological knowledge is now so often taken for granted by the medical profession that we often forget the status of infectious disease in the days before Pasteur and Koch. It is impossible to estimate the number of people who have succumbed to infectious diseases preceding the 19th century. The histories of epidemics are startling from literary as well as medical sources from the Bible to Shakespeare.

It is very interesting to note that "Pestilential disease attacked both man and beast in ancient Greece and Rome." The first plague in Rome occurred about the 16th year after its foundation. In A.D. 80 there was as many as 10,000 deaths from Plague in Rome in a single day, a city of about one million inhabitants. For many centuries the entire universe was affected by the different plagues, such as Plague, Cholera, Influenza, Typhoid Fever, Small Pox, Yellow Fever and others. Ancient and Medieval armies were hot beds for the infectious

microbes. It seems impossible as one thinks of the high mortality caused by infectious disease, that humanity was ever able to exist.

Preventative medicine has progressed considerably since the early historical and the medieval times, but it still has a considerable way to go. Decartes said, "If ever the human race is raised to its highest practical level, intellectually, morally, and physically, the science of Medicine will perform that service. The bacteriologist identifies the offending microbes and paves the way for destruction by giving authentic information about ways the germs may be spread or killed, but the rest must be done. by Public Health workers and an edlightened Public.

The control of transmissible diseases depends very largely upon the intelligent understanding of the general public and upon the cooperation of physicians and nurses as a profession, and as individuals, but their efforts alone are not enough to cope with all the problems that present themselves. Public Health administration measures carried out by local and State Boards of Health, by the United States Public Health Service have helped and must continue to help in this large program of communicable disease eradication.

Such matters as the enforcement of Health Laws; the keeping of records and statistics; the establishment of quarantine or isolation rules; the condemnation of sanitary menaces; and the collection of data for educating the public and many other functions can be handled efficiently

only by Public Boards of Health and officials of the law.

In the Public Health program there are three major factors which have checked its progress to a large extent.

(1) Too many of the appointments depend largely upon party politics which many of our best physicians tend to shun. The preparation for a good Public Health official takes too much time and money for a doctor to take up this work when he knows that his future work will be divided between Health Administration and a petty political party. Many of the inefficient health organizations are below par because some political officer has an axe to grind or a political friend to reward. The public should demand all Public Health work to be shaken from politics in place of expecting Health Authorities to cope with the political expediencies which he finds forced upon him.

(2) The second great handicap in our Public Health program is the gross lack of funds. One would think that nothing is so important to the State as the health of its people, but if we judge by the amount of money spent for this purpose that must not be true. Legislative appropriations amount to thousands of dollars for building roads and protecting animals, fish and fowls with much less hesitation than they do for maintaining or developing a Public Health unit to protect their citizens. In 1927 the Metropolitan Life Insurance Company estimated that the annual economic loss due to preventible disease was six times the fire loss, and yet the States only spend approximately 25¢ per capita to prevent the former; $1.65 to prevent the latter.

This economic loss does not take into consideration the vast amount of misery, suffering, distress and broken homes caused by diseases.

Public Health officials usually receive such small pay that they are not attracted to Public Health work by their salaries. The Public professes to believe in preventative medicine, but by the difficult time we have to raise money for this purpose one would conclude that the general public did not include the Legislator or Tax payer. Public Health funds are increasing and will continue to do so only as the laity understand. the importance of public health and that it must be bought for cash and not by credit.

The third handicap of the Public Health program is the scarcity of well-trained Public Health officials. In medical schools stress is placed upon "Doctors of Medicine" rather than on Doctors of Health, and much of the work of health officers is rather disagreeable and unpopular. In the past doctors have been motivated to the Public Health field by a political appointee, or a sideline in addition to his private practice, and by a love of the work to serve his fellow man. The last class, of course, have served well and have really been of value to their community, but the work is so hampered by politics and lack of funds that there are few such leaders.

One of the major functions of a public program is controlling communicable disease. To do this the Health Authorities must not only have the abilty to act and the money to finance it, but they also must know the method in which the

disease can best be attacked. A thorough knowledge of the various diseases, their cause and treatment, should be well understood by the Health Officer. Also some consideration must be given to community customs and social habits.

Another major factor of the Public Health Organization is teaching the people concerning disease and health. This education may be done by lectures, demonstrations, pamphlets, talks to clubs, by radio broadcast, news articles, health films and by good service. The public at various times has sought a panacea for all ills in religion, drugs, serums and mental suggestions, but never before the last century was public demand for the truth so great, which should make possible and easier Public Health Education.

However, there is also another tendency that counteracts the desire for the truth, and that is the desire to get returns from money spent in material goods. We very seldom think of our health until after we have lost it and then we would give anything to get it back. A community will contentedly use uninspected milk or drink water from a contaminated stream until there is an epidemic with loss of life and much suffering. Then and not until then will some communities become interested and enforce sanitary inspection and encourage health regulations.

Past experience has abundantly demonstrated to us that some epidemics can be foreseen and others prevented entirely by higher ways of living. Such methods of course cost money but in the long run they save much. The general feeling of

a public health program all depends upon whether the laity would rather spend their money for funeral arrangements or for a public health program.

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