

RELATION OF THE DOG TO PUBLIC HEALTH

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INTRODUCTION

Life is an endless struggle for existence. This existence involves our relationship to our fellow men both as units of a social whole and also as individuals of the animal kingdom. From the moment that we become conscious of ourselves until the moment that we are placed in our graves we struggle in our play, our work, and our hours of rest. All our actions turn in the direction of self preservation and the enjoyment of life. In our individual life we eat the flesh as well as the products of living beings so that we may not starve to death. In our business life we always try to compete with our neighbors and crowd them out of business in order that we may get most of the monetary reward. In our social and national life we have our ego which stands out in bold relief. Let the ego take the background and before long defeat must be acknowledged.

Life is a banquet. We live to eat. When our time comes, we serve ourselves as a meal for other living beings. We keep alive by eating plants or animals; they in turn eat other plants or animals and so on down to infinity. We may have scruples about eating human flesh but the flesh of certain animals that serve us for food purposes is no different in its chemical composition than that of our own. Vegetarians do not eat meat because among other reasons they assume that plants have no similarity to the animals. This is far from the truth because the plants do everything an animal does with perhaps the possible exception of moving about from one place to another. In this banquet where the strong eat the weak we must be on our guard at all times otherwise the enemy—human, bacterial, or physicochemical—will strike at a moment of unpreparedness. Unless we can fight our enemy, we necessarily must lose, and thus pass to the great beyond—the happy hunting ground of philosophers and theologians.

Struggle for existence is a natural phenomenon. We see it in all forms of life. From the lowest plants or animals to the most intricate and best developed forms of life this struggle for existence is

very evident. Even the plants that are lacking the power of locomotion show definite manifestations of this struggle. If we go to the forest, we will be impressed at once with the height attained by the trees. Growing tall is necessary if the forest trees would live. They must have exposure to the rays of the sun in order that they may manufacture food for themselves. By means of the process of photosynthesis the plants can utilize the chlorophyl in their leaves to manufacture food. In other words, the more leaves a tree has for exposure to the rays of the sun the greater the photosynthesis and the sturdier the tree. We have, therefore, a constant attempt by these trees to grow tall and allow more leaves to be exposed to the vital rays of the sun. Thus the trees that cannot reach the top become wilted and in due time dry up leaving more room for the sturdier ones. It is likewise with man. Man has to fight in order to readjust himself to his environment. Man is surrounded by disease germs at all times, and if he does not have a strong, healthy body, he will succumb and eventually die. Changes in the atmospheric conditions about us have a great deal to do with the length of our lives in this planet. Disease is fundamentally a reaction on the part of the body against a massive attack of a foe that is foreign to the body cells. Even though our bodies have the power of self repair, at times the repair is not complete with the result that such individuals have to carry on their daily routine by placing an added strain on some organ of the body.

Man is a composite living being, and is made up of billions of individual living cells each of them being a distinct unit. A certain number of cells take on special forms and functions, and thus go into the making of organs. By having a division of labor and assuming specialized functions the cells work to preserve themselves, their own kind, and finally the neighboring cells in the body. The cells have constant communication with their headquarters in the brain by means of the delicate telegraph system represented by the nervous system. The railroad system of the body by means of which necessities are brought and waste products are taken away is well represented in the heart and the circulation of the blood. One can go on and find many analogies and similarities between the workings of our complex body and the social community in which we live as units. Thus in our body we have a coordinated action of millions of cells working in unison for the benefit of their own world—our body. It is so in nature. Cells go into the making of bodies. Individuals make up colonies, nations, or races, and all live in this very small unit of the universe, our mother earth.

Disease in most cases is preventable. If proper precautions are taken so that in addition to a healthy body we do not allow any disease producing germs to enter our bodies, we might have a chance to live to be as old as Methuselah. Preventive measures have increased our average age in this earth from thirty years to more than forty. There is no reason why we cannot increase this limit to a much higher level. Our contact with anything that is infected with disease germs will make us liable to the disease. Thus, exposure is a very important link in a chain that leads to disease and misery. If we break the chain of contact by knowing certain facts about prevention, we may become free from a good many diseases. Infectious disease is always carried from one individual to another. A person infected with a certain disease in coming in contact with others in the schools, in the trains, or in the theatres, becomes a public menace because he may spread the disease to hundreds of unsuspecting individuals. What is true of the human carrier is also true of our domestic pets that may carry parasites which produce disease to man. The dog comes in most intimate contact with man. It is the unusual thing not to find, in the dog's intestine, parasites that have been proved to produce disease in man. Though the dog is a true friend, as a result of carelessness of its master, he becomes an unwilling enemy—our friendly enemy.

THE KING OF DOMESTIC ANIMALS

Before we discuss the ways and means by which the dog may carry diseases to man, it might, perhaps, be appropriate to study the relationship of dog to man. The lion is admittedly the king of the wild animals. No one will dispute the claim to this title for the dog if we limit our field to the domestic animals. Of all the domestic animals the dog has reached closer to the heart of man than any of its competitors. One may see cats or canaries in homes but most families that want to have a pet in their home prefer a dog. One may find many varieties of dogs depending on the personality of the owner. Thus the ladies of leisure are seen with their small and often weird looking pekingese, spaniels, or yorkshires. Some of these dogs may weigh only a few ounces, and make cute living toys for the fashionable women to carry around and thus attract the attention of the passer-by. For the big athletic boy, who would admire strength and good physique, a Saint Bernard, a mastiff, a greyhound, or a wolfhound would be an ideal companion. The hunter, on the other hand, would prefer a deerhound, a pointer, or a setter, while the average home owner that wants to have protection for his property would choose a bulldog in his backyard.

The dog has been a close associate of man, probably even from the most primitive stages of mankind. The more primitive the races of our day the closer is the contact between the dog and its master. To the Eskimo of today the dog is a very necessary part of his surroundings. The dog serves not only as a companion but also as a servant and a guardian. The Saint Bernard is famous for the services that he renders to those marooned in the snow covered mountains. The recent world war proved beyond any question of doubt that the dog is really of great service to man. In the average backyard, long before any one suspects the presence of an intruder, the dog gives the necessary warning with the usual bark. Be it a keen sense of smell, hearing, or sight, it is so acute that the dog perceives the presence of a friend or enemy very early.

The dog has many good qualities that help it get the name of king of the domestic animals. He is a companion and a guardian. No other domestic animal has those qualifications. The cow can only supply milk and meat. The pig supplies the pork. The hen and its relatives supply us with eggs and meat. The horse uses its strength to our advantage. Is there an animal around a household that can surpass the value of the dog? Of the other domestic animals that vie for honors the cat is the only other one. The cat, however, is a parasite. She likes to be praised and petted but revolts and scratches when punished. On the contrary, the dog not only takes punishment without much complaint but wags its tail obediently. The courage that the dog has shown never has been equalled by any other domestic animal. A dog would gladly dare swim any turbulent stream to lend a helping hand to its master. The dog is appreciative. Do a good deed for a dog and he will remember you for months and years afterwards. Kick a dog for malice and months later he will growl at you from a distance as great as a half or even a whole block. Be good to a dog and he will sacrifice his own life to save yours. In general the dog has numerous characteristics that are human. In addition to these he has courage, he is obedient, and perseverant. Those are all kingly qualities, and the dog, who always has them all, must be classified as the king of the domestic animals.

OUR FRIENDLY ENEMY

The dog is by far man's best friend. A man may be forsaken by his family, his friends and enemies, but never by a dog. Once a dog becomes attached to a person the animal sticks to the master until the end. All the adjectives that signify a noble character may well be applied to the dog.

There are numerous incidents that are spoken of to portray the courage and self sacrifice of the dog. Is it any wonder that we regard the animal as our best friend? Next to children we like the dogs best of all. Some people prefer the dog even to children. The dog does not discriminate. Once adopted as a pet the dog will stay with the master regardless of sex, age, color of the skin, or social status. It makes no difference to a dog whether the master is a king or a tramp. He would just as soon travel on foot with his tramp master as to travel de luxe in a private train of the king and his retinue. Be kind to the dog and he will be faithful to you until the end.

The dog is not selfish. As long as the dog is given enough food and a comfortable place to sleep, he is satisfied. He would even tolerate rough handling when it is justifiable. A story is often related of an experience of Napoleon the Great. "Amidst the silence of a beautiful moonlit night a dog leaping suddenly from beneath the clothes of its dead master rushed upon us and returned to his hiding place howling piteously. He alternately licked his master's hand and ran towards us. I voluntarily stopped," relates Napoleon "to contemplate the scene. This man, thought I, has his friends in the camp but he is forsaken by all except his dog." No doubt the dog was so unselfish that he made the great sacrifice of remaining close to his master's body until he died. No parallel is found in the animal world except as it refers to a relation between the mother and the offspring. It is not at all surprising that man should care for the dog better than any other of the lower animals.

In spite of all the good things that we can say about the dog, the latter is instrumental in spreading certain diseases from himself to the master or from one individual to another. On account of the great love that we all have for the animal we give the dog so many privileges that at times he becomes dangerous. There are certain restrictions that must necessarily be imposed upon the dog, otherwise he becomes an unwilling carrier of disease. If not restricted, the dog becomes a potential enemy—our friendly enemy.

THE DOG AS A CARRIER OF DISEASE

A carrier of disease is any one who is instrumental in the transmission of a disease. There are two types of such carriers. In the first class belong those who act as carriers during the course of an illness. Those suffering from pulmonary tuberculosis are a very good example of this type of transmission. A person afflicted with tuberculosis of the lungs may cough up millions of tubercle bacilli, and if not careful about the disposal of the sputum, he becomes a menace to

society by exposing all those about him to the disease. In the second class of carriers belong those individuals who carry certain pathogenic micro-organisms without the least discomfort or evidence of any physical disability. For example, a certain group of persons have a great tolerance for the germs of typhoid fever. If these persons work in any place where food products are being handled, they may very well act as a proper means of developing a typhoid fever epidemic. Such epidemics may frequently arise from a restaurant or a dairy plant.

The dog may be regarded as a carrier of both types. There are certain diseases such as rabies, tuberculosis, and some skin diseases that cause definite symptoms in the dog just as they do in man when the latter becomes infected. It is during the period of his illness that the dog may carry the disease to man. On the other hand, the dog may carry certain parasites and also the germs of practically all childhood diseases without showing any signs of illness. He thus becomes a mechanical carrier of disease. Let us now analyze how the dog becomes a disease carrier and therefore our friendly enemy.

Wanderlust in man and beast is an inherent quality for search of new surroundings and new experiences. Every man in his gradual mental evolution goes through a period during which he has an irresistible desire to get away from the ordinary surroundings. Charles Darwin in his *Origin of Species* states that "there is good reason to believe that slight changes in the conditions of life give vigor and fertility to all organic beings." Most of us experience exactly what Darwin states when we go on our summer vacations. When we return we feel so invigorated and anxious to get back to work that it takes several weeks or perhaps months before our work becomes a job again. The ever present instinct of always looking for *terra incognita* and new experiences varies in different people. This instinct may be developed to such a great degree that in some people, such as the gypsies or the hoboes, it modifies their mode of life to fit this peculiarity. The dog is more or less a hobo and likes to skip out whenever opportunity offers itself. In spite of the close domestication and care, the dog frequently finds his way out into the backyard or alley in search of new playmates or surroundings. During such expeditions the dog literally sticks his nose and paws in all possible garbage cans and dirt. He also mingles and plays with the children of the neighborhood regardless of their health or cleanliness. A sick child or one that is a carrier of a disease present in a brother or a sister hails the dog and plays with him. In his attempts to show appreciation the dog may come in very intimate contact with a carrier and thus on his return to the master's home he is no longer a

friend but an enemy, laden with germs of any childhood disease that might kill the youthful master.

Before we make any effort to describe the more serious diseases that the dog may carry, it might be appropriate to give a brief outline of the diseases and parasites that have been reported in the dog and also in man.

- I. Rabies or hydrophobia.
- II. Tuberculosis.
- III. Mechanical Carrier of Childhood Diseases.
Measles, scarlet fever, diphtheria, poliomyelitis, whooping cough, chicken pox, mumps, pneumonia, and intestinal diseases of infectious origin.
- IV. Intestinal Parasites.
 - A. Protozoa.
 1. *Entamoeba histolitica*—causing dysentery.
 2. *Giardia* or *Lamblia intestinalis*—causing enteritis and gangrene of the lung.
 3. Trypanosomes—causing sleeping sickness.
 - B. Roundworms or Nematodes.
 1. *Toxascaris limbata*.
 2. *Eustrongylus gigas* or giant blood worm or giant kidney worm.
 3. *Trichinella spiralis*—causing inflammation and abscesses of muscles.
 - C. Flukes or Trematodes.
 1. *Opisthorchis felineus*.
 2. *Paragominus Kellicotti*—a lung fluke.
 3. *Clonorchis sinensis*.
 4. *Clonorchis endemicus*.
 5. *Schistosoma japonicum*.
 - D. Tapeworms or Cestodes.
 1. *Echinococcus Granulosus*.
 2. *Coenurus cerebralis* or the Gid.
 3. *Dipylidium caninum*.
 4. *Dibothriocephalus latus*.
- V. Skin Parasites.
 - A. Lice and Fleas.
 1. *Trichodectes canis*—a flea harboring one stage of dog tapeworms.
 2. *Pulex irritans*.
 3. *Ctenocephalus canis*.

- B. Mange (scabies) parasite similar to, perhaps same as in scabies (seven year itch).
 - 1. Sarcoptic type.
Follicular or demodectic type.
- C. Ringworm.
 - 1. *Trichophyton microsporum oospora*.
 - 2. *Eidamella*.
- D. Ticks.
 - 1. *Dermacentor variabilis*.
 - 2. *Dermacentor venustus*—carrier of organism that causes Rocky Mountain spotted fever.

VI. Arachnida.

A. Tongue worms or *linguacula rhinaria*.

It is evident from this outline that the dog is a definite factor in the transmission of diseases and must be thought of as such more seriously than was done in the past. It is also evident that these diseases are not easily recognized by the average person. It is necessary therefore to be on our guard always for possible infection from the dog. By following some simple rules it is very easy to make the dog perfectly harmless in the household.

Of the diseases carried by the dog the most serious is that of rabies or hydrophobia. It is an acute disease and kills its victim very promptly. Like tetanus, it can be prevented by prophylactic injections but when left to itself and developed in its full clinical form, it always kills. The frequency of this disease is in proportion with the strict observance of the local muzzling laws. Rabies is practically unknown in countries where the laws compel all dog owners to muzzle their dogs before they allow them in the streets. Thus in North Germany rabies is practically unknown because of the strict observance of the muzzling regulations. In England there was an average of about thirty deaths a year from hydrophobia until the enforcement of the muzzling law. Since then—1912 to 1926—no deaths from hydrophobia have been reported from England. In the United States where no one observes the existing muzzling regulations we still average about sixty deaths a year from hydrophobia. These deaths are absolutely uncalled for, and these people do not have to be sacrificed on the altar of the god of careless dog owners. The solution is perfectly evident. Muzzle all dogs when they are out in the streets and you will have no deaths from rabies.

The germ of rabies is present in the saliva of the dog. It finds its way into the human body through a scratch or a bite from the rabid

dog. Once the germ is introduced into the body, the patient or the susceptible animal will surely die unless given the inoculations that have been discovered by the great Frenchman Louis Pasteur. These prophylactic injections have been so well perfected that any physician now can give the treatment just as easily as the injections for the prevention of lockjaw.

In the dog the disease manifests itself in two forms namely, the furious and the dumb forms. The furious form corresponds to the stage of hyperexcitability in the human. The dog will gnaw on wood or clothing and has a strong desire to run away. He refuses the usual food, or takes it, holds it in the mouth for a moment and then drops it. He has a strong tendency to snap at everybody. It is during this stage that the dog is most dangerous. At first opportunity he will run out and bite everyone that he encounters. Soon the paralytic stage develops. This has a characteristic tendency to have paralysis develop in the dog's hind legs. During this stage the dog dies of heart failure. In the dumb type the stage of hyperexcitability is only very slight and promptly goes on to the paralytic stage and carries off the animal.

After the disease develops the only treatment that is given is to relieve the patient of the agony during the stage of excitability. Nothing so far has been successful in the cure of the disease after it has developed. In order then to save at least sixty human lives a year in the United States we must prevent infection by muzzling the dog. Moreover, if one is bitten by a dog that acts queerly that dog should be handed over to the proper authorities to watch the animal for typical symptoms or if necessary to sacrifice the animal in order to see if the Negri bodies are present in the brain. If there is any suspicion of rabies the prophylactic treatment should be instituted at once in order to save that human life. In Illinois we have a regulation forcing dog owners to take a dog to the pound or a dog hospital for a ten day observation when the animal bites someone. If the animal shows any suspicious signs of rabies, it is killed and the head is sent to the State Public Health Laboratory to determine the presence of Negri bodies. In the meantime the Pasteur treatment is begun on the patient.

Intestinal parasites may be easily transmitted from the dog to man. Intestinal parasites are of three different varieties. In accordance with their general shape they are classified as roundworms, tapeworms, and flukes. These worms vary in size from two millimeters to one and a half meters or more in length. Thus the echinococcus worm measures only 2.5 millimeters in length, while the giant kidney or blood worm (*eustrongylus gigas*) measures 1 to 1.5 meters in length. Both these are found in the dog and both are transmissible to man. Another

important characteristic of the intestinal parasites is the entire change of form and manner of living during various stages of the life cycle. These changes may be regarded as mutations if we may be permitted to use the term. One sees an entirely different individual under completely different surroundings and had it not been for the untiring efforts and studies of the zoölogists we would be blind to the fact that these variable forms are only different stages of the animal's life cycle.

Two distinct periods can be demonstrated in the life cycle of the echinococcus. The adult form is found in the intestine of the dog and certain other animals that do not have an intimate contact with man. The embryonic form is the one that is found in man and also certain domestic animals. The embryonic form manifests itself in the form of bladder-like cysts that may be lodged anywhere in the body but more especially in the liver and the lungs. Such cysts have also been found in the heart, the brain, the eye, the kidney, or underneath the skin. It is amazing how the parasitologist, like a Sherlock Holmes has traced the worm through the various pathways that it takes in its existence. In the dog's intestine the worm presents the following characteristics. It is a very small tapeworm and measures only 2.5 millimeters in length and 0.6 millimeter in breadth. The head measures about 0.7 millimeter in breadth and has four suckers and a double row of hooks of various dimensions. Generally there are thirty to fifty hooklets on the rostellum. The neck is very short, and the body consists of three or four subdivisions that are called proglottids. The terminal proglottid, when mature, contains four hundred to eight hundred eggs with their hexacanth embryos. Each egg or ovum measures thirty to forty thousandths of a millimeter and contains an embryo. Each terminal proglottid is liberated and with it are also liberated the hundreds of eggs now free to roam for new experiences and new surroundings. They find their way to the outside world in the feces of the dog. Some eggs remain clinging on to the dog's hairs, his paws, or his mouth. In more than one way they ultimately find their way into the mouth of man. Frequently a statement is made that typhoid fever is a connecting link between the feces of a patient suffering from typhoid fever and the gastro-intestinal tract of the next man who becomes ill with typhoid. This statement is equally true in echinococcus and also most of the intestinal parasites. Because the echinococcus spends its adult life in the intestine of the dog, the latter is referred to as the direct host in contradistinction to the term intermediate host in whose body the parasite spends its embryonic existence. One of the intermediate hosts of the echinococcus is man.

Let us now follow the worm from the dog to man. After the eggs reach the mouth of the host, they are easily swallowed and are lodged in the stomach. In four to five hours the gastric juice dissolves the membrane of the egg and thus liberates the living embryo. The latter now gets mixed in the food content of the stomach and passes down into the intestine. Here it attaches itself on to the mucosa of the intestine by means of its hooklets. The embryo now burrows its way into the wall of the intestine and, after reaching the capillaries, it enters the circulation and finds its way into the various distant parts of the body. It lodges most commonly in the liver and lung and develops into a cystic mass—the hydatid cyst. The body of the host now mobilizes its own defensive powers and tries to localize this cyst by building a thick wall around it. Thus if this wall is strong enough the hydatid may develop and stay there indefinitely or even die without producing much harm to the body. Frequently after its full development the hydatid cyst ruptures and liberates its contents that reach the dog and develop into adult worms. The hydatid cyst is made up of a thick laminated wall and an internal wall which serves as the germinating layer for the smaller or daughter cysts. Within these daughter cysts one sees the developing young scolex. In other words each daughter cyst represents an adult worm. In each hydatid cyst there may be as many as five hundred daughter cysts. The development of the scolex is very slow and requires five to six months before the worm reaches maturity. It is these daughter cysts that eventually find their way into the stomach of the dog, their wall is broken, and an adult worm finds itself in the intestine of the dog.

Echinococcus disease is most common in countries where the dog is in very intimate contact with man. Thus in Iceland, Australia, and Brazil the disease is most prevalent for obvious reasons. It is found in all parts of the world. In the United States there are as many as five hundred cases reported. This number, however, represents only a very small proportion of the actual number of cases in this country. Invariably the dog can be traced as the carrier of the disease.

Fortunately echinococcus disease yields to proper treatment and therefore is not as deadly as rabies. It is a preventable disease and must come under the control of the public health measures. Two routes are open for the prevention. First, contact with diseased dogs may become eradicated by curing the dog of the echinococcus. In the second place, we can limit the privileges of the house dog so that even if infected the dog will be harmless. The wisest procedure would be to eradicate the worm from the dog's intestine and also to limit the dog's privileges in the home so that there would be no possibility of infection.

Tuberculosis is less common in the dog than in man. In spite of this fact, however, the animal can easily act as a carrier of the disease. The dog carries tuberculosis primarily as a mechanical carrier. By coming in contact with someone who is suffering from tuberculosis, the dog can very easily carry the tubercle bacillus to someone who does not have the disease. Tuberculosis is a very common disease among human beings. Various observers, particularly Opie, have definitely shown that tuberculosis is practically a universal disease. Opie has found tubercles in the lungs of more than 95 per cent of his autopsies. In spite of the fact that tuberculosis is such a common disease, only a very small proportion of the people die from the disease. It is those people who are undernourished or have a low resistance that usually die from the disease. Children and people of old age are more likely to die from tuberculosis than the young adults. Tuberculosis in infancy almost invariably means death to the child. An infection with the tubercle bacillus may or may not mean the development of the disease. It is for this reason that in spite of the large proportion of infected individuals with tuberculosis only very few die of the disease.

The dog is in very intimate contact with his master's household. He is allowed to play with the children of the family and even to eat at the same table with his master. Frequently careless or over-loving masters will allow the dog to eat even from the same plate. By going around in the neighborhood the dog can pick up many germs one of which may be the tubercle bacillus. Frequently the dog lives in a household where there is a patient with active tuberculosis. In such a household the dog may easily come in contact with the tubercle bacillus and carry it mechanically to other individuals. Careless patients who cough up a certain amount of sputum and do not dispose of it in a way so as to make it harmless may easily become instrumental in producing a carrier out of the dog. In an ordinary amount of sputum it has been shown that one can find several billion tubercle bacilli. If that sputum is not disposed of properly by expectorating into a paper napkin and then burning it, one can easily transfer the germs from one individual to another. Naturally a small amount of sputum which is loaded with billions of bacteria, when dried up will allow these germs to float in the air and eventually find a landing place in the lungs of the unsuspecting person who is exposed to a tuberculosis individual. The dog could very easily carry the tubercle bacillus in nostrils, hair, or on paws. By coming in contact with an unsuspecting infant or a child from the neighborhood the dog can easily infect such child and infection in a child may ultimately mean active tuberculosis and possible death.

To prevent the dog from becoming a source of danger in carrying tuberculosis, we must see to it that dogs should never be allowed to remain in a household where we find patients with active tuberculosis. This perhaps is the only means of preventing transmission of tuberculosis through the dog because no matter how careful a person may be in isolating a dog in a tuberculosis home, isolation of a dog is a thing next to impossible. The dogs perhaps could be removed to another place until the patient with tuberculosis gets well. Under such conditions the dog should be given a skin disinfection and should be kept out in the open at least twenty-four hours. The ideal method of rendering such a dog harmless would be to take the animal to the nearest veterinarian who would give him proper care and treatment.

HOW TO PREVENT THE SPREADING OF DISEASE BY THE DOG

The dog is the best companion in a household where there are no children. No one will deny this fact. A dog can stay in a household for many years and if only a few simple rules regarding prevention of disease would be followed the animal would never be a menace to the community. It is only because of ignorance and carelessness of the master that the dog becomes a carrier of disease and therefore a nuisance. Just as the careless human being will go down the street and cough into people's faces and thus spread disease, so will the dog carry disease if not properly educated. The master has a duty to perform in limiting the dog's privileges and educating the animal to be more careful.

In the presence of infectious diseases such as scarlet fever, diphtheria, measles, chicken pox, etc., we ordinarily quarantine the child and his relatives but we pay very little attention to the domestic pets, particularly the dog. Such diseases are primarily spread from one individual to another in the playground where two or more children will play and come in very close contact with each other. The dogs are usually very willing playmates of children in the neighborhood. In the presence, therefore, of diseases that are transmissible, we must quarantine not only the family but also the dog.

Some dogs which are brought over from other lands may carry certain diseases that are common in the regions from which they come. This is particularly true of echinococcus disease which is common in Australia and Brazil. The same thing is also true of certain flukes that are common in Japan and China and can be easily transmitted from one end of the world to another through the dog. Such dogs coming from other lands, therefore, should be quarantined for a certain

period of time and be watched for the presence of various communicable diseases that are common in the lands from which they come.

Rabies or hydrophobia is practically always transmitted from one individual to another through the dog. In cases of hydrophobia the dogs should always be kept in the house and never be allowed to roam around without being muzzled. If any dogs develop any symptoms that would suggest the presence of hydrophobia it is necessary to always isolate such a dog and watch it over a period of time. If it would be necessary to kill such an animal we must always without fail notify the local health authorities so that they would make a proper examination of the brain and the spinal chord for any evidences of rabies. It is a fact that in countries in which there are strict muzzling regulations the disease is entirely under control. In the United States there are no such regulations in force. For this reason our mortality rates from rabies are unusually high. It is evident that in order to prevent rabies we must follow the example of Germany and enforce the muzzling law literally and thus lower our death rate. It certainly does not do any harm to the dog to keep him muzzled when the animal is out on the street.

There are many stray dogs in our communities. These dogs eat out of ash cans and sleep in alleys and back yards that are full of filth and disease. The family dog, in answer to the call of the blood, may run with such a stray dog, become infected, and carry an infection into his master's home. We must dispose of all stray dogs by either giving them over to educational institutions for use in the experimental laboratories or else to the local anti-vivisection society who will either find a new home for the animal or perhaps dispose of the animal by suffocating it with illuminating gas. Just which is the best method of disposing of such stray dogs depends primarily upon the element that makes up a particular community. If the community is made up of men and women who are broad minded enough to see no malice in the use of the dog for experimental purposes, such dogs will promptly be transferred to the local educational institution to be used for experimental purposes. If on the other hand the community is made up of old fogies who must be anti-something in order to be happy, the dogs of that community that have no homes will be taken over to the pound and killed by some means or other without performing any useful act for humanity.

In the home the dog should be trained so that he does not become a nuisance. At best being only a lower animal and not having the necessary mental qualifications that a man has in order to be of the same standard, the dog should be treated as an inferior but not un-

kindly. There is absolutely no excuse for anyone to allow the dog to lie in his bed. We spend a large portion of our lives in bed and I am sure we do not want to spend this part of our lives in between filthy and germ-filled sheets.

At the table the dog should under no circumstances be allowed to eat from the same plate as the master. In the first place it is disgusting and in the second place it is dangerous. In a series of 500 consecutive examinations of intestines of dogs for parasites we found that more than 95 per cent of the dogs contained intestinal parasites. The eggs of these parasites are commonly found in the mouth of the dog. What could be easier than to spread disease by this means? In order that we are certain that the dog is free from parasites, we must have a veterinarian administer vermifuges to the dog at certain periods and thus dispose from time to time of the worms present in the intestine of the dog.

The veterinarian is the man who is best qualified to treat the dog's skin and prevent the presence of mange, two types of which have been proved to be transmissible to man. The skin of the dog should be kept clean and free from fleas that usually carry the embryo of a tapeworm which is very common in the dogs.

We dispose of our excretions in sewers and use medication to render them harmless. In spite of our efforts in the disposal of our own sewage we pay no attention to the excreta of the dog and a mere wiping of the floor or the carpet is sufficient with the dog owner. The dog's excreta are just as dangerous as our own, and care should be taken to render these sterile and harmless. There is a long list of convenient antiseptics that can be used for this purpose.

The dog is the easiest animal to train to do tricks. He is very obedient and very persistent. The dog will try repeatedly until he learns to perform what he is expected to do. Such being the case, it should be a very easy task to train the dog to defecate in the yard at a certain specially appointed place for this purpose. The dog should be trained not to sleep in the bed or under the bed. One is just as bad as the other. Moreover, the dog should be trained not to lick the hands or face of an infant. It is a very discouraging sight, indeed to see a father or a mother kiss their own child in the mouth. More so if they allow their child to be poisoned by the licking of the innocent and unsophisticated dog.

The dog likes to skip out of the house and run around the neighborhood for new experiences. There are certain periods during the year when the dog wants to run out of the house more so than ordinarily. A castration frequently will keep the dog in his place when all the other means fail.

The most important consideration is that of treating the dog as a dog and not as a human being. The dog has rightfully earned for himself many privileges in the home. In most homes, however, the dog has been allowed more privileges than some of the human members of the household. It is in these homes that the dog is an innocent menace by virtue of these extended privileges. Be kind to the dog, play with the dog, keep company with the dog, hunt with the dog, but don't allow the dog to lick the baby's face, or eat from your plate, or sleep on, or under your bed. Regard the dog as a dog and not as a human and the dog will be a better and more useful friend.

How then are we to approach this problem? We cannot do it through regulations because no one will heed them. We have an excellent example of this in the 18th amendment. We can get results, however, if we make an effort to educate the general public to the dangers of indiscriminate contact with dogs. Such quotations as the following must be popularized so that even children may be able to repeat them.

1. Don't kiss a dog.
2. Dogs should not eat at the table.
3. Dogs should not sleep in your bed.
4. Everyday is a bath day for me and my dog.
5. Both you and your dog must see your doctors regularly.
6. Muzzle your dog and protect your neighbors.
7. No dogs are allowed in a sick room.
8. If you like your dog keep him at home.

With posters having such quotations or similar ones the public may be educated to the dangers of disease transmitted by the dog. In closing let us emphasize the fact that a dog should be treated as a dog and not as a human being.

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