Glanders : how its arises and spreads how to prevent it and how to stamp it out / by William Hunting.

HUNTING ON GLANDERS

GLANDERS:

HOW IT ARISES AND SPREADS; HOW TO PREVENT IT; AND HOW TO STAMP IT OUT;

BY

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Ten years experience as Veterinary Inspector in Westminster and Chelsea has convinced me that the frightful loss continually taking place amongst the horses of cab and omnibus proprietors, and in the studs of railway, tramway, and carrying companies, will not be prevented merely by the strict enforcement of penal laws.

The disease is so wide spread, so insidious in its attack, and so slowly fatal, that a whole army of Inspectors would be necessary to detect every case, to see it properly isolated, and to guard against the transmission of contagion to other horses. To exterminate glanders, stringent laws must be enforced, but it is also essential that the horse-owner be enlightened as to the nature of the disease, and convinced of the certainty with which it can be stamped out.

Without his willing co-operation success is impossible.

In the following pages I have attempted to supply all the facts and arguments required to establish the statement that glanders can be completely stamped out, and that such a course is practical and economical.

WILLIAM HUNTING.

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GLANDERS.

It is impossible to say what the exact annual loss from Glanders may be. The returns made under the Contagious Diseases (Animals) Act do not at all represent the loss. Nowhere does the Local Authority enforce the Act so thoroughly as in the Metropolis, but even here it is calculated that at least five times as many horses die as are reported. There are six large horse-slaughtering establishments in London, and it is a very fair estimate which credits them with the daily reception of only one diseased animal each. We are quite safe then in saying that 2,000 horses die every year in London alone from glanders or farcy. In Edinburgh and Glasgow; in Liverpool, Manchester, Birmingham and other large towns the mortality is proportionate, but owing to the absolute neglect of all attempt to enforce the Act by the Local Authority only a few odd cases are reported. It will probably not be far from the truth if we say that the whole kingdom

loses annually 4,000 horses of the average value of £15—a total loss of £60,000. Add to this the worry and loss of work entailed, the frequent ruin of small proprietors, and the occasional death of human beings from this frightful disease, and we have a strong case in favour of more active repressive measures. How is it the proprietor of infected horses neglects to avail himself of the assistance offered him, and refuses to take the course most beneficial to himself and the country? How is it he endeavours to hide the existence of disease, keeps infected animals in his stables, and takes no precautions to prevent its spread until the diseased horse reaches the last stage of misery and uselessness? There is only one explanation—ignorance! He believes glanders to be, like chills and colds, inevitable; he believes many cases can be cured; he thinks an animal cannot be a centre of infection till it shows positive external symptons of structural disease; he fancies that if he succeeded in stamping it out it might again arise from conditions over which he has no control. In every one of these suppositions he is wrong. Were he correct in his premisses he would be logically justified in evading the Act and endeavouring to prolong the life of all but the very worst cases in his stables. As a matter of fact many large studs of horses when once infected never again get clear of the disease—not however from any

impossibility, but simply because those in charge are wanting either in the knowledge or energy necessary to frame and carry out proper measures.

At the present moment I can point to studs of forty or fifty horses in which the disease is always present, and has been for years, and I can point to others (some much smaller, some ten times as large) in which no case has appeared for years, but which were once absolute hot beds of infection. What has been done in one stable can be done in another, and what has been done in a number of stables can be done for the whole country. I make this assertion with a full appreciation of the vast differences in feeding, stabling and working to which the various kinds of horses are inevitably submitted. I ask no one to accept my bare assertion, but to consider the facts and arguments which I shall produce, and then to say whether there can be any doubt as to their correct interpretation.

History.—The history of glanders is not merely interesting to the professional man, but instructive to everyone who wishes to understand the disease. It has existed in Europe from the most distant time, being described by the earliest writers on horses. It now prevails in nearly every country which has been brought under the influence of civilization. In the more recently settled

countries its first appearance can be traced, but in all European states its origin is lost in the distant past.

In Europe, no great campaign has ever terminated without glanders appearing amongst the horses of cavalry or transport. On the conclusion of peace, both the opposing armies have carried home the disease, and spread it far and wide through their respective countries. The armies in the Crimea suffered fearfully. The horses in the Franco-Prussian war not only fell victims to the disease on active service, but for years after the conclusion of peace the movements and sale of these animals caused numerous outbreaks all over Germany and France. Great loss from glanders accompanied the armies engaged in the American Civil War, and our own army has suffered grievously in every campaign on record, except perhaps the last Zulu war. The last war in Afghanistan entailed a loss of 63,000 animals, and although I do not know what causes led to this frightful mortality, I have no doubt glanders was one of them. Even peaceful autumn manœuvres cannot be completed without an outbreak of the malady and its consequent dissemination over the country, on the the break-up of the camps, by the sale and distribution of cast horses.

It has been the custom to account for all this as the inevitable sequel of the hardships incidental to camp life, and the fatigues induced by long and arduous marches.

Such explanation does not however tally with the facts. Camping out is not injurious to horses; on the contrary, it is usually accompanied by a cessation of all respiratory disease. Contagious maladies affecting both man and animals do not arise in armies from the exposures or hardships encountered, but are introduced by the bringing together of vast numbers of individuals from various places, some of whom are already infected. One case of infection is enough to introduce the disease, and its spread is facilitated by the circumstances—large numbers of animals, close contact, inability to separate, and too often neglect of the most elementary sanitary precautions. Similar circumstances—minus war—are often accompanied by outbreaks of glanders. Extensive peace manœuvres require an extra number of animals. These are collected from all directions, and should one horse be infected, disease is introduced. Once introduced, its spread is easy and rapid; its extent depending entirely upon the measures taken at first to detect it and thoroughly stamp it out.

Before the days of railways, glanders prevailed all along the main highways, where carriers and postmasters regularly worked glandered studs of horses, although they knew perfectly well that the disease was contagious. At the present time it is almost entirely confined to the large towns, and chiefly to the stables of omnibus

and cab proprietors, whose studs are constantly being replenished, and are thus most liable to the introduction of an unnoticed infected animal.

The history of glanders clearly indicates that the disease follows the lines of traffic, being most common where horses are most largely collected together, and almost, if not quite, unknown in places into which there is no immigration of horses. In other words, the history suggests the cause of outbreak to be the introduction of infected animals, and the spread of disease to be dependent upon the circumstances which favour contagion.

Nature of the Disease.—Glanders is a contagious disease due to a specific poison in the system, and is capable of transmission to nearly all warm-blooded animals. That it is contagious is shown by its spread from horse to horse in any stable where a decided case is permitted to remain. Direct experiment has proven its contagiousness over and over again. If matter from the nose of a glandered horse be inserted into a wound on a healthy horse, glanders results. The discharge from the nose is not the only fluid from an infected animal capable of transmitting the disease. Many years ago it was demonstrated that the blood of a glandered horse transfused into the veins of a healthy one would produce the disease with great rapidity and certainty. Direct innoculation is not

necessary for infection. The poison may enter the system through the stomach, through a mucous membrane, or even through the skin, and produce symptoms as definite as when introduced through a wound, or direct into the veins.

Glanders is transmissible not only from horse to horse but to human beings, lions, tigers, mules, donkeys, dogs, goats and guinea-pigs, but cannot be produced in cattle or in pigs.

It is customary to speak of Glanders and Farcy as two separate diseases, but it should never be forgotten that they are both due to the same poison, as is shown by the fact that the matter from a farcy-ulcer when conveyed into the system of a healthy horse may cause glanders, whilst the nasal discharge from a glandered horse may, by innoculation, produce farcy. In both diseases too we find that, when the external symptoms have existed for a long time, the condition of the lungs is alike. The identity of the two conditions is further shown by the termination of chronic cases in which glanderous disease of lung has existed for some time without any external signs. Such cases, as the result of a general shock to the system, may terminate in acute glanders or, as the result of local injury to a limb, in farcy. The distinction between farcy and glanders is, then, one merely of the form in which a specific poison produces

external signs, and not one dependent upon any difference in the actual poison giving rise to the disease.

The Causes of Glanders.

"Of all the contagious maladies affecting man or "the domesticated animals, perhaps Glanders is the "disease which would be selected as an example of the "spontaneous or direct development of a virulent or "infecting element. Those who maintain that a con- "tagious malady can never be generated, but that its "appearance must depend on the presence of a previously "existing germ, have had but little or no experience "among horses, or of this disease. The highest continental "veterinary authorities, and those who have most "attentively studied the etiology of the affection, are "absolutely unanimous in their opinion as to its being "at times developed directly, and without contagion "having anything to do with it. The innumerable "facts derived from many years' observation afford "perfectly conclusive evidence that, under the in- "fluence of certain causes of an appreciable character, "Glanders will develope itself without the intervention "of a contagium."—So says Dr. George Fleming in a book published only ten years since. It would be difficult to make a more positive or dogmatic assertion. I quote it merely to say that the learned author now knows

better, and is one of our strongest supporters in the belief that glanders arises only as the result of one cause—contagion. That it never arises spontaneously, and cannot be produced by any cause or combination of causes which does not include the specific poison found in the blood and other tissues of an infected animal, is now the accepted doctrine of all the best veterinary authorities in this kingdom. There is no dispute about the fact that 95 per cent. of cases are due to contagion. Difference of opinion only exists as to the origin of the odd 5 per cent. in which one is unable to trace directly the means of infection, and in which therefore it is presumed some other cause must have existed. These cases, it is argued, are of spontaneous origin, *i.e.*, they depend upon some cause or causes other than the poison from an infected animal.

Fortunately such causes have been stated, and we can examine them; they are:—faulty ventilation, excessive labour, insufficient or improper food, inclement weather, colds and diseases of the chest, painful injuries, mange, excessive doses of physic, etc., etc. Let us take them seriatim.

Faulty Ventilation—One of the oldest facts supposed to support the theory that bad ventilation may cause glanders, is traceable to Professor Coleman, who

used to relate in his lectures "that in the expedition to Quiberon, the horses had not been long on board of the transports before it became necessary, owing to stormy weather, to close the hatchways; the consequence was that the horses were almost suffocated by the heat and foul air, and that almost all of them when disembarked were suffering either from glanders or farcy." Now before it can be said that the faulty ventilation caused the disease, it must be shown that the horses were healthy when placed on board ship. This cannot be done, but on the contrary, it is well known that at that time (1809) the British army was reeking with glanders. It is well known that if horses have the glanderous poison latent in their system, such a condition as partial suffocation continued for days will develope the external signs of the disease with great rapidity and certainty. It must also be mentioned that horses have frequently been submitted to similar conditions at sea without the appearance of glanders. To come to our own experience, we all know stables in which the ventilation is faulty, but in which glanders does not exist; and we know stables in which glanders prevails, but where ventilation and all other hygienic requisites are carried out thoroughly and carefully.

Excessive labour is credited with the power to cause glanders, and it is a fact that the disease often appears in over-worked horses. It is also a fact that glanders is common enough in horses doing only fair work, and it is not unknown in those doing none. We find studs of horses constantly over-worked in which glanders is quite unknown. In coal-mines the horses are frequently over-worked. I have known mines in which horses falling dead at work were ordinary events of weekly occurrence. I have known this go on for months, and yet no sign of glanders ever developed. There is no argument in favour of excessive work being able to cause glanders, except the fact of its appearance in some horses so abused, and the explanation is, that when the disease exists latent in an animal *(and not unless)*, the debility resulting from over-work facilitates its development. It does not *cause* the disease, but it facilitates its progress.

Insufficient or Improper Food.—That glanders may appear amongst horses improperly fed is just as true as that it may appear amongst those better cared for. If feeding could cause glanders it would affect the whole stud of animals more or less equally, making allowance merely for the superior strength and condition of some. Whenever any cause which affects a whole stud produces disease it acts immediately upon numbers, and we have

signs of the disease appear, not on one or two, but upon nearly the whole lot. If musty oats, for instance, cause excessive action of the kidneys, do we find only one or two horses in the stable affected? No! we find all, or nearly all, staling profusely, and we find such symptoms cease with the removal of the cause. With an outbreak of glanders we have quite a different state of things. We have first here a case and there a case. We find the disease does not cease with a change of food, and we can trace contact between horse and horse to account for its spread. There is no known condition of food or method of feeding which we can rely on for the production of glanders. Every abomination and every irregularity which the ignorance or greed of man can submit the horse to, has often been in existence without a sign of the disease. On the contrary, we too often find glanders appear in studs, the food and feeding of which is selected and arranged on the very best principles.

Inclement Weather.—In the hottest and coldest climates horses exist free from glanders. In our agricultural districts horses frequently spend the winter in exposed fields, and the ponies of Shetland are certainly submitted to as great trials from the inclemency of the weather as it is possible to conceive, but glanders is unknown. In large towns, where the disease prevails, it

is a fact that extreme changes in the weather or prolonged extremes of either cold or heat are attended by an increased mortality amongst horses from glanders. It is also a fact, that whereas all the animals in the town are more or less exposed to a similar condition, only some are affected. A very suggestive fact I have often noticed is this:—that when we have a week of very trying weather followed by an increase of cases of glanders, nearly every extra case arises in a stud already infected. There is no increase in the number of infected stables, but only in the number of infected animals, and the inference seems plain,—that the weather did not cause disease in healthy animals, but it developed into patent disease what was previously latent.

Colds and Diseases of the Chest.—It has often been noticed that colds and diseases of the chest may terminate in glanders. In studs of horses where the disease has been prevalent this is common. Probably there are quite as many horses affected with respiratory disease in the stables of private gentlemen as in the stables of cab-proprietors, and yet glanders as a sequel is found only in the latter. Every degree of respiratory affection, from the slightest chill to the most violent pleurisy, has often been witnessed in horses of all ages, in strong and weak, in fat and thin, in the hard con-

ditioned and in the soft—in every variety of state and circumstance—without the slightest sign being discovered, either during life or after death, of glanderous disease.

Painful Injuries.—If a horse have glanders latent in his system, a painful injury may, and often does, render it apparent by causing the development of the disease. Broken knees, nails in the feet and other injuries have often been accompanied or followed by the symptoms of farcy or glanders. In infected studs such sequels to severe injuries are common, but in healthy horses the most painful injuries exist with no sign of glanders. Like all the other alleged causes, painful injuries have no effect except in developing what already exists.

Mange.—This parasitic skin disease has been accused of causing glanders. It is quite true that the two diseases have been known to prevail together, but there is no direct connection between them. That mange in horses could cause glanders is just as true as that the itch in man could cause small-pox or cholera.

Excessive doses of Physic.—At a meeting of Veterinary Surgeons about fifteen years ago, I heard a leading London practitioner assert that he could pro-

duce glanders by the administration of six drachms of Aloes. His assertion was based upon the fact that he had often seen such a dose followed by the disease. Now scores of horses have been killed by excessive doses of aloes and no sign of glanders been detected. A large dose of aloes produces a violent effect upon the system, and if given to a horse suffering from latent glanders is very likely to develope definite signs of the disease. It is thus very useful as an aid to diagnosis, and may be resorted to in cases of suspicion to assist in "bringing out" the disease.

It seems absurd to argue that an excessive dose of aloes is not a cause of glanders, but I have mentioned it as, like the other alleged causes I have discussed, its action may develope the disease although it cannot produce it. I quite allow that any debilitating influence will facilitate the course and developement of glanders, but I deny that any of the conditions I have considered can originate it. They all have existed frequently without the appearance of glanders, and glanders has prevailed in the absence of every one of them.

There is only one cause which logically satisfies an enquirer who has had wide experience of the disease—Contagion. To this cause 95 per cent. of cases are directly traceable, and the other 5 per cent. are simply unexplainable in their origin owing to the difficulty of

tracing the method by which the contagion was carried. There are two circumstances which render the origin of an outbreak of glanders often difficult to trace, 1st. the fact that it is a disease which may lie latent and unsuspected in the system of a horse for a year or more, 2nd. the impossibility of knowing what other horses the infected one has been directly or indirectly in contact with.

I have attempted to show what reasons there are for disbelieving that the alleged causes of glanders have any power to produce the disease. I must now show what reasons we have for believing that the disease is due to contagion only. I would first submit, that when we find any condition or event to be undoubtedly traceable to one distinct cause ninety-five times out of every hundred, there is a strong case for believing that the other five similar conditions or events are also due to the same cause, even if we fail to trace it.

Glanders behaves like other contagious diseases—it spreads from one animal to another. It is most prevalent where the greatest facilities for contagion occur—*i.e.*, when horses are brought together in large numbers and are constantly changing their position and their owners. It arises under conditions of the most opposite character, but always presents the same special signs of its existence in the animal affected. In every

case the disease when once developed is contagious, and in all cases the poison, existing in the blood and discharges, is capable by innoculation of producing a similar disease in a healthy horse. Remember, then, these points—that the whole system of an infected horse contains a poison; that the smallest quantity of this poison is sufficient to infect another horse; and that the disease is always recognisable by specific symptoms and changes in the body. It is an undoubted fact that we can successfully innoculate a healthy horse with matter from a farcy-ulcer on the leg, or with glanders matter from the nose. We can also successfully induce the disease by transfusion of the blood, or insertion of the flesh, of a diseased animal, and thus prove beyond doubt the existence of a poison throughout the whole system. Only a very small quantity of the juices or fluids of an infected animal are necessary to communicate the disease, which then affects the whole animal as in the previous case. Now this shows that whatever the poison be, it has the power to increase and multiply in the living horse. All substances having this power are living organised bodies,—call them what you like—seeds, germs, or organisms. Poisons such as arsenic have no powers of multiplication. A small quantity of the blood of an animal poisoned with arsenic would have no poisonous effect, the exact quantity administered remains

in the system but cannot increase. Not so with an animal poison like that of glanders. It grows and multiplies, so that the few drops necessary to infect a healthy animal soon permeate the whole body, just as a piece of leaven leavens a mass of dough, and from that mass a small portion may again leaven a larger mass. The poison of glanders is, then, in its behaviour exactly like a seed—capable of growth and increase when placed in suitable conditions. It still further resembles a seed in producing always definite results. The seed of turnips, or oats, or beans, when placed in suitable conditions always produces turnips, or oats, or beans. The poison of glanders always produces glanders. It never gives rise to strangles, or influenza, or mere blood-poisoning. The produce of a seed is always a definite plant, and the produce of glanders-poison is always a definite disease. We may safely assert then, that the system of a glandered horse contains a definite specific poison, and we argue that if the poison be specific it can only arise from a similar poison derived from some source where such poison exists. At present we know of no other source than a previous animal infected with glanders. Thanks to Pasteur, and other scientific workers, we know that no object however small, possessing life, can be produced from dead material, that all life springs from previous life, and that living

objects invariably derive their life from *similar* living objects.

We conclude, therefore, that the poison in the system of an animal suffering from a contagious disease can only arise from a similar poison; in other words, that a contagious disease can only be produced by the poison of the same disease, and therefore that glanders can only arise from a previous case of glanders. If this be true it ought to be possible to find and identify the specific poison of each contagious disease. As a fact this has been done in many diseases, and quite recently in glanders. Scientific men have detected the poison of glanders, they have separated it from the infective fluids of the diseased animal, watched its growth and increase out of the body in certain suitable conditions, and proved its identity by successfully innoculating healthy animals with the cultivated poison. This is the positive evidence alone requisite to prove the theory, which every other act concerning the disease indicated as probable.

That nearly every case is directly traceable to contagion; that the disease arises under all sorts of opposite conditions; that it affects all classes of horses; that no causes, when the possibility of contagion is eliminated, are capable of producing it; that innoculation always produces it; that the disease is always a definite

specific one—all these facts point to a specific poison as the cause, and now as a final proof we are able to identify the poison.

Against this chain of proof what does the other theory offer us? Simply this—that it is impossible to trace the origin of a few cases: and upon this alone is based the common belief that glanders may arise without any contagion having reached the horse. If I see oats or turnips growing but fail to trace the sowing of the seed shall I say they must have originated spontaneously? Certainly not! I conclude that they must have risen from seed, and from certain definite seeds too, which will be again re-produced in them. Similarly, when I see a case of glanders, and am unable to trace the method of communication, I know it originated from a similar case, and am in no way shaken in my belief because I am unable, in this instance, to directly discover the exact channel through which the specific poison has passed. I am sometimes asked how, if glanders always proceeds from a previous case, the first case arose? I can only reply by another question—how did the first oak tree arise? We are convinced that now they only arise from acorns, and we are equally convinced that the organism causing glanders only arises from a previous organism of a similar nature.

When we accept the theory that glanders arises

only from glanders, the whole history of the disease, its methods of spread, its symptoms and nature, its peculiarities, and its prevention, become tolerably clear to us, but on any other theory everything is contradictory and confusing.

The Specific Poison.

The poison of glanders, I have said, lives and grows in the body of the horse, and may be cultivated in favorable conditions out of the body. It may too, remain inactive but still potent under certain conditions. Just as seeds retain their vitality when dry, or may under other circumstances die and rot, so the poison of glanders retains its vitality under some conditions, but dies and decomposes under others. Like a seed, too, it may be killed. The conditions favorable or unfavorable to its existence are important, and although we do not know them all, we know sufficient to assist us in framing measures of protection against it.

The poison of glanders is not volatile.—It has long been recognised by practical observers that a horse may remain stabled with glandered horses for months and yet not take the disease. He breathes the same air and is submitted to every other condition that affects the whole stable of horses, but he is fortunate in not

having actual contact with the poison of the disease. The experiment of placing a healthy horse between two diseased ones under conditions which carefully protect him from direct contact has been repeatedly tried, and the horse has remained healthy. A French experimentalist has gone further, and absolutely made healthy horses breathe the expired air from diseased ones. On each of the two horses was placed a sort of mask and the two were then connected by a tube. The experiment was frequently repeated, but the disease was not communicated.

Another experiment was as follows :—Glanderous matter placed in a saucer was covered by a glass bell-cover, in the top of which a piece of cotton wool was suspended over the poison. Warmth was applied to the saucer, and the arrangement left for some hours. Then healthy horses were innoculated—some with the cotton-wool, and some with the matter in the saucer. The latter developed the disease, the others did not. This was tolerably clear proof that the infective material was not volatile but fixed. Since the date of these experiments, other observers have identified the poison as a microscopic organism known in science as a bacillus.

The Vitality of the Poison.—That matter from a glandered horse's nose remains dangerous for some time

after being separated from the horse is well known, but that it retains its power to infect for a very long time is merely a surmise, and opposed to facts based on careful observation. It is quite certain that glanders poison if exposed to the air and kept moist very soon decomposes and becomes harmless. When dried it retains its vitality much longer. Successful innoculations have been made with poison kept dry for six weeks, but this seems to be about as long as it can be kept when exposed to the air, even under favorable conditions. Some very trustworthy observers state that dried glanders matter does not retain its infective power even up to six weeks. Glanders poison loses its activity altogether if exposed to the temperature of boiling water. It is also destroyed by many chemicals such as are employed for disinfecting purposes. It is easily killed by carbolic acid, by Condy's fluid, chloride of lime, and such substances, but they must be used of sufficient strength—not too much diluted. The bacillus—the specific germ of the disease, when separated from the nasal discharges is found to behave differently at various temperatures. At 130° F. it is killed. It grows and developes actively at 75° F., still more actively at 103° F., but ceases to grow at 112° F. A temperature of 60° F. or less also stops its growth. These observations are extremely instructive as showing that the poison of glanders grows well at a temperature

equal to that of the blood of a living horse, but grows best when the temperature is raised to fever heat, and thus explains how the febrile condition is so often the means of increasing or even developing the disease in infected horses. It also accounts for the greater activity of the disease in badly-ventilated hot stables.

Modes of Infection.—It is most important to understand how the poison obtains entrance to the systems of healthy horses, in other words, what are the various methods of infection. Direct innoculation into the blood vessels we know is one way. This is often employed in the experimental production of the disease. Horses may also be infected through the fine membranes lining the eyelids or nose; through sores on the skin, such as exist in cases of cracked heels, broken knees, or even harness galls. The unbroken skin is very seldom the channel of infection, but it has been proven that if glanderous matter be rubbed into a sound skin it may be absorbed and cause the disease. In this way mangy horses may possibly infect themselves by rubbing against posts, bales, or mangers upon which active poisonous matter has been deposited by diseased animals, and healthy horses by the friction of their harness during work may also become infected through the skin. One other important mode of infection there is, viz., through the

stomach. Glanderous matter swallowed with the food or water is infective, and I believe this to be the most common mode of infection. Diseased horses sneeze into the mangers of other horses next to them, they infect nose bags, drinking troughs, and pails, and thus the special poison passes into the stomach, and from it into the circulation, where it rapidly grows and developes.

All horses are not equally liable to infection. Strong horses certainly become diseased, but they have a greater power of resistance than weak, debilitated ones. It is remarkable too, that aged horses are not so liable to infection as young ones. Breed and sex seem to have no effect upon the disease, either as regards its commencement or duration.

All diseased horses are not equally infective. The nasal discharge from an old chronic case is not so deadly as that from a rapid and violent one—from what is called acute glanders. Scientific observers are able to explain this by showing us that the matter from chronic cases does not contain the same amount of special germs—bacilli. In acute cases the secretions are swarming with the bacilli. The scarcety or abundance of the bacilli in glanderous matter is the factor upon which depends its power or virulency. Probably the failure of many experimental innoculations can be explained by this, and it helps us to understand how some animals in a stable

become infected whilst others escape. Infection depends upon the admission to the blood of active bacilli—*i.e.*, of living organisms special and peculiar to this disease.

Symptoms.

The symptoms of glanders are very easily recognised when the disease is fully developed, but are obscure in the earlier stages. Glanders is sometimes very sudden in its appearance, and rapid in its course ; at other times it arises gradually—almost imperceptibly,—and is prolonged for months. The former cases are called acute, the latter chronic.

Acute Glanders.—The peculiar characteristic of acute glanders is the existence of fever in addition to the local signs of disease. The horse neglects his food, the pulse and respirations are quickened, and pain evinced on pressure being applied to the sides of the chest. The glands under the jaw are swollen, there is a discharge of matter from the nose (usually from both nostrils), and the membrane lining the nostrils is of a dark brick-red color. Early in the course of this disease, a careful examination of the nasal membrane will show one or more greyish spots raised above the level of the membrane. These raised patches soon alter. The surface gives way, and being removed in the discharge, leaves

an ulcer of irregular shape, but always having a well-defined margin. The ulcers do not gradually run into the sound membrane, but are as distinct as if they had been punched out with a tool. They vary in size from a pea to a diameter of an inch or more. They show little tendancy to heal, but spread rapidly, and extend, more or less, throughout the nasal passages ; sometimes affecting the larynx and windpipe. The extensive ulceration very often leads to bleeding, and thus the nasal discharge becomes streaked with blood. Swelling of the nostrils, and thickening of the nasal membrane are common symptoms, and cause considerable interference to the passage of air, often giving rise to a roaring sound in the breathing, and even producing imminent suffocation.

These cases frequently run a very rapid course, ending fatally in a few days. The termination depends upon the strength of the animal and the condition of his vital organs. When weakened by other diseases, or by the intensity of the accompanying fever, death soon ensues. When the lungs have long been the seat of glanderous changes, and the acute condition is only a development of old-standing disease, death takes place in two or three days, and a few cases run their course in twenty-four hours.

When death does not quickly end a case of acute

glanders, the feverish symptoms abate, the constitutional disturbance gradually subsides, the discharge from the nostrils becomes less, and the swollen gland under the jaw decreases in size, or may even entirely resume its proper form. The ulceration on the nasal membrane ceases, the cavity of the ulcer is filled up by new tissue, and a white cicatrix is left—a lasting memorial of the attack, and a caution to those who understand its significance. This apparent recovery is unreal, for the poison never leaves the system. As it circulates with the blood it permeates every tissue and organ, and there is one organ where it seems to find suitable conditions for quiet development. The lungs of a glandered horse never become free from the disease, although every external symptom disappear. In the lung, the specific poison of glanders may quietly develope and increase without any prominent sign of disease being noticeable for months, and in one case I have known this latent form to exist for two years after an acute attack of farcy—death revealing glanderous disease of both lungs to an extent I have never seen surpassed. As a rule, however, acute glanders is followed by chronic glanders—in other words, there remain some signs that the system is still infected, although no active departure from health is made evident.

Chronic Glanders.—It is not necessary for the production of chronic glanders that the acute form of disease shall have preceded it; in fact, the majority of cases arise in horses which have never shown any of the violent symptoms I have just described. A well marked case of chronic glanders is characterized by a discharge from the nose—usually from only one nostril—and by an enlargement of the gland under the jaw.

The nasal discharge may be the first symptom to show itself, or the swollen gland may precede the discharge. When both conditions exist together they are found on the same side of the head. The discharge is not of any definite character. It may be watery, it may be white and purulent, or it may even be snorted out in thick lumpy masses. As a rule, it shows less color than other nasal discharges. If it has a peculiarity, it is its stickiness, which causes it to adhere to the edges of the nostrils, to the fingers of anyone handling the nose, and to wood-work against which the animal rubs. It is seldom accompanied by any disagreeable smell, unless the lungs are badly diseased, and then the breath of both nostrils is equally fœtid, especially after an attack of coughing. The idea that glanderous matter behaves differently in water to other purulent discharges from the nose is erroneous, and not to be depended upon as of the slightest assistance in distinguishing the disease.

Sometimes the discharge is constant, but increased by exertion; sometimes it is intermittent, and only noticeable for a short time after the horse has been at work. Such cases are very dangerous, as they are infective, and likely to be overlooked. The discharge from a glandered horse's nostril is always contagious, whether constant or intermittent; whether white and mattery, or brownish and watery.

The enlargement of the gland under the jaw is peculiar. It remains hard, shows no tendency to suppurate, and becomes fixed pretty firmly to the jaw bone. The gland is lumpy and nodulated, not smooth and rounded; and this condition is more marked in old-standing cases than in recent ones. It varies in size from the slightest increase to the bulk of an orange, but is usually about as big as a walnut.

The nasal membrane, in chronic glanders, is always altered in color from the healthy pink to a bluey-gray, almost a leaden hue. This condition may often be noted before any other sign of disease is manifest. Of course it is, by itself, only suspicious, as it arises in other conditions of a harmless nature, but if it be seen in an infected stud, or associated with a suspicious history, or any other symptom, it should be sufficient evidence to warrant the separation of that animal for a time.

The nasal discharge and glandular enlargement are

sooner or later accompanied by another sign—ulceration of the nasal membrane—which leaves no doubt as to the nature of the disease. It cannot however be too often repeated that this is not necessary to prove glanders. A horse may be glandered for months, and capable of infecting other horses, without any ulcer appearing in his nose. If we were always to wait for this one symptom before treating a horse as dangerously glandered, we should leave the majority of cases until the very last stage of the disease had set in. The glanderous ulcer when first seen is usually about the size of a pea. There may be one or more, they rapidly increase in size, and where they touch, join to form one large ulcer. It is seldom these ulcers heal, but when they do, a permanent white scar is left upon the membrane of the nose.

Accompanying these specific signs of chronic glanders we often have an unthrifty appearance of the animal, with more or less wasting of the body. Sometimes there is a cough—short, hollow, and when provoked, repeated. The cough may be induced by exertion, and depends upon disease of the lungs. Pressure with the knuckles in the spaces between the ribs will show soreness, and give rise to a "grunt." When a horse that is not a "roarer" grunts on being threatened, there is always something wrong with the chest; and when in addition we find a nasal discharge, or an enlarged gland, the

probability is that the grunt signifies glanderous disease of lungs. The skin is often what is called "hide-bound," and the hair may be readily pulled out from manes and tails. Sometimes excessive staling is noticed, and when the other horses in a stable are free from this condition, it is advisable to treat the symptom as suspicious, even if no other sign be apparent. As debility sets in, we frequently find a tendency for the legs to become "humoury"—the legs below knee and hock presenting a thickened and puffy appearance. Chronic glanders ends in what horse owners call "a break-up of the constitution,"—the symptoms become more marked, fever sets in, and death from acute glanders soon follows. The expression implies an error, because no part of the body is unsound except that directly dependent upon glanderous disease.

Farcy is the name given to the group of symptoms produced by glanders poison when it affects the skin and sub-cutaneous tissues. Its characteristic symptoms are the appearance of small hard swellings, commonly known as "farcy buds" or "buttons," and long narrow swellings called "cords" from their resemblance to the elevation of skin that might result from a piece of stout cord being placed under it. Farcy buds most frequently appear on the face, neck, shoulders or sides, and on the limbs—the inside of the leg more often than the outside.

The "cords" run from the "buds," radiating outwards, or when there are groups of buds, from one bud to another, the whole being connected together in a manner so characteristic that they cannot be mistaken. In many cases a part infected with farcy becomes generally swollen, and then the cords are not so well defined. When the first sign of farcy is simply "humoury" or dropsical swelling, mistakes in diagnosis may be made, but a very short time elapses before the swelling shows a "corded" appearance, and the small characteristic hard lumps appear.

The farcy bud varies in size from a threepenny-piece to a shilling—a few increasing to the diameter of a half-crown. They remain hard for some days; in chronic cases undergoing little change for a week or even two, but in acute cases, softening and bursting in two or three days. The contents are pus and serum, usually tinged with blood, which runs down the skin, adhering to the hair, upon which it hardens and forms a semi-transparent crust.

Other swellings are often noticed in farcy—large solitary tumours—situated on the back and hind quarters. They reach the size of an orange, and are very slow in their course. If opened, the contents are not usually white matter, but transparent bloody-yellow, oily fluid. When the contents have escaped, they suppurate and

show little tendency to heal. Frequently the first appearance of farcy is swelling of a limb, not distinguishable from ordinary "weed" or humour. It requires a day or two to develope the characteristic signs, but their development may be hastened by a dose of physic. When the poison is in the system of a horse, an injury to the limb—a wound, a bruise, a sprain or a nail in the foot—may cause the sudden development of farcy. In infected studs this should not be forgotten, as the contagious nature of the disease may be overlooked, and the sponges, used in fomenting, become the means of spreading the malady to other horses.

The symptons of farcy may be the first sign of glanderous infection; they may arise in the course of a chronic case of glanders; or they may appear in a horse which has long suffered from glanders latent in the lungs. These various conditions alter the symptoms of farcy by mixing up with them some or all of the signs of glanders. We thus may have, in addition to the peculiar characteristics of farcy, swollen glands under the jaw, a discharge from the nose, debility and wasting of the body, cough and "grunting," denoting lung complications or even the specific ulceration of the nasal membrane.

Those cases of farcy in which the symptoms are localised in the skin and sub-cutaneous tissues,

I take to be due to primary infection of the affected part. Those cases in which symptoms of glanders are also prominent, I consider due to secondary infection of the lymphatics of the part. I incline to believe that the variations in the symptoms of glanders and farcy are all explainable by the local predominance of the bacilli. When the bacilli infest the blood vessels we have glanders, and if a fever temperature exist we have acute glanders. When the lungs are the chief seat of the bacillus we notice the gradual debility and wasting, accompanied by cough and other chest symptoms which so closely resemble the signs of tuberculosis or consumption in man. When the lymphatic vessels and glands are the seat of bacilli in active development we have farcy, and so long as the bacillus is confined to the lymphatics the horse remains free from the graver signs denoting general infection of the whole body.

Acute farcy.—When the symptoms of farcy are accompanied by general constitutional disturbance, *i.e.*—fever, we have acute farcy, The external signs of the disease are more marked, and they more rapidly run their course. The swellings are greater, the buds suppurate more rapidly and show no sign of healing In some cases the whole body is covered with farcy buds;

in others very few buds appear, but one or more legs are enormously swollen.

When due to recent infection such cases may terminate in a slow abatement of symptoms; when due to secondary infection and accompanied by old standing disease of the lungs, they almost invariably end fatally in a few days.

For the sake of clearness of description it is convenient to describe glanders and farcy as separate forms of disease, but it must not be forgotten that their nature is the same. The one essential condition of glanders and farcy is identical—a specific poison in the system. Either form of disease may, when acute, prove fatal in a few days. Both, when chronic, are accompanied or followed by changes in the lungs. This glanderous change in the lungs is the gravest of all symptoms, as it admits of no remission, and is always progressive. When once established, time only is required for it to cause death with certainty, and during the whole term of its existence it renders the affected animal a dangerous source of contagion—doubly dangerous because often not suspected.

Period of Incubation.—We notice in glanders, as in all contagious diseases, a lapse of time, after the infection, before any symptoms are evident. This period,

from its analogy to the hatching of eggs, or the sprouting of seeds, has been termed the "period of incubation." If we directly innoculate a horse with the poison of glanders, signs of the disease are evident in from five to eight days, but if the infection take place naturally the period is longer. When the poison is swallowed, from one to three months may elapse before the disease is developed. In the majority of cases it may safely be assumed that an animal showing signs of farcy or glanders was infected one month previously, and this is very important between buyer and seller if disease appears shortly after purchase. It is impossible to say what the limit of the incubative period may be, as cases arise in which no sign of disease has been detected for a year or more after infection. In all such cases, however, we find changes in the lungs which are not of recent date, and we conclude, therefore, that the incubative stage had long passed and disease commenced, but in a latent form.

This latent form of glanders is by no means uncommon, and is made evident when some shock to the system, from injury or febrile disease, suddenly developes glanders. A *post mortem* examination shows glanderous lungs of a quality incompatible with recent infection, and we can only conclude that glanders (latent in the lungs) had been in existence for some considerable time.

The latent form of glanders may probably be very prolonged if nothing occur to cause constitutional disturbance in the animal so affected. If well fed and not over-worked; if fortunate enough to escape other diseases, and accidents, such an animal would probably show no sign of glanders until the changes in the lungs proceeded so far as to seriously interfere with their functions. We can thus understand how the period of incubation appears so indefinite, and how the state of the lungs should at times appear inconsistent with the duration and mildness of the disease.

Diagnosis.—Glanders may be mistaken for some other disease, and there are many cases which, in the earlier stages, even an expert may fail to diagnose. It should be a rule then to treat all doubtful cases as suspicious until we are sure that they are harmless.

What adds to the difficulty of detecting the disease is the fact that a horse with glanders latent in his system may suffer from other complaints, the signs of which resemble those of glanders. A horse with long-standing glanderous disease of lungs, may catch a cold; all the symptoms are those of a common cold, and if the owner does not suspect the hidden mischief no more care is taken of the horse than is usually bestowed on the simpler complaint. It is soon found, however, that re-

covery is unusually slow, the cough does not cease, the discharge from the nose continues, and more constitutional disturbance is noticeable than with an ordinary cold. The fact is, the recent cold has developed the old disease which was lying latent, and when the direct effects of the chill have passed away we have, clearly shown, the special signs of the greater evil. The explanation generally offered is that the chill caused glanders. This is not the case, it merely developed the complaint. The symptoms of the two diseases existed for a while together, and one of them was disguised.

A somewhat similar complication is seen as the result of injury to a limb. A painful wound, a violent sprain, or blistering, or firing a leg may, in a healthy horse, be followed by a great amount of swelling. Should one of these causes affect a horse with glanders latent in his system, the swelling is greater than usual. Instead of settling down in a few days it increases, pain is more intense, the general disturbance more marked, and sooner or later the character of the swelling alters and signs of farcy appear. Here again the local pain does not *cause* farcy, it only developes what was in the system.

This sudden development of glanders by other diseases is a most serious complication, because the prominence of the signs of the recent injury or disease

may blind us to the fact that we have a greater danger to contend with. In any stud of horses where a case of glanders has existed within the last twelve months it is only common prudence to at once remove to a separate loose box every case of illness or lameness, and to keep it there until we are certain that nothing of a contagious nature is developed. Better take the necessary precautions, for a few days, in separating a score of innocent horses than allow one undetected case of glanders to remain an hour in a crowded stable.

Strangles has been mistaken for glanders. The resemblance is that both may present a discharge from the nose, and a swelling under the jaw. In glanders the swollen gland is usually on one side only, it remains hard and shows no tendency to form matter. In strangles the swelling is usually in the centre, between the jaws, it increases in size, softens, and matter is formed within it. In glanders the discharge from the nose escapes from one nostril; in strangles the discharge is from both nostrils. In glanders the colour of the membrane lining the nose is less red than usual; in strangles it is a brighter red than in health. In strangles ulceration of the nasal membrane is never seen; in glanders its existence is distinctive, but there are many cases of glanders without ulceration. It may also be remarked that strangles

usually attacks only young horses; glanders affects animals of all ages.

Diseases of the bones of the face have been confounded with glanders. Tumours in the nose, diseased teeth and other conditions give rise to chronic discharges from the nose—mostly from only one nostril. The diagnosis of these cases is too complex to describe here, and should be entrusted to a professional adviser. I may just say that as a rule such cases cause a decided stink from the affected nostril, whilst glanders does not until the very last stage, in which the lungs are diseased, and the breath from both nostrils is then offensive.

The form of glanders described as farcy may be mistaken for other conditions accompanied by swelling of the legs. Many of these cases at the commencement cannot be distinguished by the most careful expert. What is termed "humour" in England, and "weed" in Scotland, is, in its first stage, precisely the same in appearance as some cases of farcy. When a swelling is symptomatic of the latter disease, a day or two will not pass before the character of the swelling becomes more definite, and either "cords" or "buds" appear. A dose of aloes will facilitate diagnosis, as it aggravates farcy, but assists the dispersion of the more harmless swelling.

Purpura has been mistaken for farcy, but they are quite distinct. In purpura we find the

characteristic purple stain in the nasal membrane, and there is a decided tendency to similar swellings on both sides of the body. Whether fore or hind legs be swollen, in purpura the swellings are symmetrical, reaching about the same height up both limbs, and extending about the same circumference on each.

"*Nettlerash*" has been known to frighten a horse-owner not much experienced in equine diseases; but it always arises suddenly, the lumps on the skin vary greatly in size, and are diffused all over the body. They disappear nearly as rapidly as they arise.

When a horse presents the three symptoms of—ulcerated nasal membrane, discharge from the nose, and an enlarged gland under the jaw, there need be no difficulty in deciding that it is suffering from glanders. It is, however, a monstrous error to suppose that all these signs must exist to enable an expert to be positive of the animal's condition. There are scores of horses incurably glandered, and capable of infecting other animals, that live for months without developing all three of the positive signs which some men consider necessary to support them in a decided opinion. If a horse have an enlarged gland, a pale colored nasal membrane, a wasted body, and (not being a roarer) a "grunt," he is glandered. If a horse have a pale coloured nasal membrane, a discharge from one of the nostrils, and a

"grunt," he is glandered. If a horse have a chronic cough, an intermittent discharge from the nostril, and a "grunt," he is most likely glandered. The significance of such groups of symptoms is made more evident by the history of the horse and the stud in which he stands. To only remove horses from a stud when every sign of glanders exists, to delay slaughtering until the very last stage of disease is reached, is unreasoning folly, and the man who adopts it has no possible chance of ever stamping the disease out of his stables.

Glanders must be diagnosed in its earlier stages—before it has infected other animals—if it is to be economically and surely stamped out. The timid or modest man need not immediately resort to the pole-axe on a half-formed conviction. He can separate all suspicious animals, and he must isolate all very suspicious ones. He must, however, be very careful that his isolation is complete, or his carefulness will overeach itself. The rash and conceited man, who fancies his diagnosis infallible, is responsible for any errors he may fall into should he wrongly anticipate disease.

Curability.—No one in modern times has claimed to have cured glanders. There are a few cases in which the symptoms disappear for a short time under medicinal treatment, but always with the same result—to become again developed, and ultimately to cause death.

As to the curability of the form of the disease known as farcy, opinions are not unanimous. Nearly every case, in which the external signs are cleared up by treatment, breaks out again sooner or later, owing to the poison of the disease remaining active in the lungs. There is simply a remission of symptoms, not a cure of the disease. I have known this remission of symptoms extend over a space of more than two years after the "cure" of farcy, and then a *post mortem* examination revealed the worst pair of glandered lungs I ever saw. A period of six or eight months' remission of symptoms is common enough, and these so-called "cures" enable men to sell horses with no external sign of disease to indicate their dangerous condition. It is these "patched up" cases that carry the disease from stable to stable, and that render its effectual stamping out impossible. Even granting that a small proportion of cases of farcy do make a permanent recovery, we have only a very poor argument in favor of treating such cases.

No horse-owner of large experience who has suffered much from glanders will contradict me when I say that the man is "in pocket" who destroys every case as soon as he sees it. I challenge any one to show me a large stud of horses, once infected with glanders, that has ever got clear of the disease if attempts to cure cases of farcy

were persisted in. Personally, I deny the curability of either glanders or farcy, but I acknowledge the honesty and skill of some brother practitioners, who assure me they have treated occasional mild cases of farcy, cured them, and had them under observation for years afterwards without ever detecting any further sign of disease. I make this acknowlegement as a matter of courtesy—not conviction, holding that no observation of these cases can be conclusive unless verified by a *post mortem* examination.

Suppose, however, for the sake of argument, that five per cent. of cases of farcy make a permanent recovery; that forty-five per cent. temporarily recover; and that fifty per cent. terminate fatally. Is this sufficient to warrant a man in attempting a cure?

The facts are these—half the cases inevitably die, the other half require from four to eight weeks rest and treatment, during which time they are centres of contagion, from which the disease may spread to other horses. Nearly all these cases, after the trouble and expense entailed, are only temporarily relieved. They are patched up for a time—the symptoms removed, but the disease latent—and liable to re-appear suddenly in an acute form. As long as such animals live they are possible centres of contagion, and when they again develope symptoms, it may be hours, or it may be days

before they are detected, and then not until perhaps many good healthy horses have been infected by them. Knowing this, many owners sell horses which have been patched up, with the result that such animals pass into the stables of unsuspecting men, who probably do not recognise the disease when it re-appears, until the whole of their stock has been infected. The sale of these "patched-up" horses is moral swindling; it is the greatest cause of the spread of glanders; it is the ruin of many small proprietors, and it should be made a criminal offence by law—as doubtless it now is if a guilty knowledge could be proved.

The Contagious Diseases (Animals) Act does not permit a man to keep and treat a case of glanders, but it does allow him to keep and treat farcy as long as he likes. Why this distinction? The incurability of glanders is certain; the incurability of ninety per cent. of farcy is equally certain. Both forms of disease are contagious, both are due to the same cause, both are capable of inducing either one form or the other in healthy horses, and yet the distinction between the two, recognised by law, renders futile any possibility of stamping out either. So long as we have farcy, so long must we also have glanders.

The true interest of honest horse-owners is to cease treating every case—to stamp it out as soon as they are

certain of its existence. They should also bring to bear upon the Government all the pressure they can command for an alteration of the law, making compulsory slaughter applicable to farcy as it is to glanders.

Methods of spread.—In practice we find that when glanders breaks out in a stable it spreads with apparent irregularity. The first case is often not detected till a contagious discharge from the nose, or an equally contagious discharge from some ulcer on the skin has been in existence long enough for the poison to have passed to other horses.

I remember an outbreak in which the first case was mistaken for strangles. This horse was moved about from one stall to another, owing to the working arrangements of the stud, and, when finally recognised as glanders, had passed through four different stalls, in each of which he had fed, and into each of which the next horse was allowed to go without any cleansing or even emptying of the mangers. This shifting from stall to stall occupied about a week, and during the next three months I was able to trace the death from glanders of every one of the four horses that occupied the stall in which he had stood and fed. This firm employed no regular veterinary attendant, and my knowledge of the outbreak was gained as official inspector. Here was a

clear case of spreading the disease through the food in the mangers. Now, remember, a horse may be infected and show no prominent symptom except a slight nasal discharge on coming in from work. Such a horse may walk into the wrong stall, put his head into the manger, sneeze, and infect the food therein; he may put his head into the manger on each side of his own, when only separated by bales, and so infect them; he may go direct to a drinking trough in the yard or in the street, or he may drink from a pail, out of which a healthy horse drinks what he has left. Such an animal may share a nose-bag with another horse, and in cab yards it is more often that two horses share a nose-bag than that one is supplied to each horse. In these ways glanders is spread irregularly amongst a stud of horses, the infection is carried by the food, and the poison enters the system through the stomach. This is the most common method of spread, and it is the most difficult to provide against, because it can only be prevented by removing horses from the stud before they have developed any discharge which may infect either food or water used by other animals.

Sponges, leathers, combs and brushes may carry the disease from one horse to another, and this method of spread most frequently occurs in stables where farcy is being treated, with or without every precaution against

contagion being adopted. All horse-owners know the weakness of stablemen for collecting tools, and how they seem to lose all conscience in the matter of sponges, leathers, etc. It matters not to them that such articles are kept separate and distinct for use on a diseased horse; they gladly appropiate them whenever seen, and thus innocently favor the spread of contagious maladies. A diseased horse in a stable, however carefully isolated, is a living centre from which the poison of glanders may be carried in many different ways. It is practically impossible to ensure that no infective matter escapes, or is carried to other horses. No man, save those who are "penny wise and pound foolish," would knowingly keep for treatment or any other purpose such a dangerous animal—one liable to cause the death of men as well as other horses. I deliberately assert that anyone advising the treatment of farcy in a stable, or on premises where other horses are fed, gives bad advice, and that if he is paid for his advice he should be held responsible for its results.

The spread of glanders, in a stable, is tolerably easy to trace, but how does it spread from stable to stable? This question would be answered if we could trace the origin of each outbreak. Every year I see a number of fresh outbreaks, and always endeavour to trace their origin. It is seldom I am unable to do so. In nearly every case the animal first seen diseased is a recent

purchase, and when I can follow it back I find it came from an infected stable. In 1885 from one sale of thirty-two horses I was able to trace eight different outbreaks of disease. Some years ago I saw a stud of forty horses in which some deaths from glanders had occurred, and in which one or two cases then existed. The owner and his adviser credited the disease to over-work. A little questioning showed that four of the cases arose from amongst eleven horses purchased at a cab sale, in Walworth, and further enquiries elicited the fact that many other buyers at that sale had suffered a similar experience. The owner of this stud did as he had been done by. Knowing that his stock was infected, and not knowing how many more horses he might lose, he had a sale, and thus passed on to others the centres of contagion, which in time would develope and spread the disease in various stables. And this is done daily in London!!! When a man, by neglecting, or perhaps not recognising the first case, allows the disease to spread in his stables, he finds horse after horse "break up" and have to be slaughtered. Sooner or later he makes up his mind to "clear out the remainder." He either has a sale on the premises or sends the lot into auction. They are sold and disseminated all over the town. No one can trace them all, and every horse that does not show the disease within a week or two, but developes the signs of what is in him

a month or two later, is thought by its new owner to be the victim of a spontaneous outbreak.

In 1875 I saw a case of farcy in a private stable, in Mayfair. There had been no new horses in the stable for two years. The one affected had been in the service for four years. No case had been known in the neighbourhood, and no strange horse had ever been in the stable. The origin of the outbreak was a puzzle. In 1877 I was talking to a man from Harrow, and expressed my surprise at his intimacy with the subject of glanders. "Oh," said he, "two years ago, we lost a lot of horses from the disease at ————," naming a hotel—the very hotel, I remembered, at which the Mayfair horses were put up when they went to Harrow once a week. This casual acquaintance supplied the key to what otherwise would have been a secret.

Messrs. P. and O. have a large stud. They enlarged their stabling some years since, and shortly afterwards an outbreak of glanders took place, which caused frightful loss. The origin was never traced, and the new stabling was blamed as not being dry enough. Four years later a man told me how he once had a good job at Messrs. P. and O's., having "four years ago done all the carting for their new stabling." At that very date this man's horses suffered from glanders, and there was

a drinking trough in the yard, to which his horses and those of the firm had equal access.

Concerning street water troughs I hear a good deal. About half the unexplained outbreaks are charged to these institutions, and I must allow that it is quite possible for infected horses to drink at them and be immediately followed by healthy horses. It is then possible that some of the outbreaks in London may be traceable to the public drinking trough. That they are a common means of spreading the disease, I deny. Tramway, omnibus, and cab horses suffer most from glanders, and yet the majority of these animals never approach a public trough. Small carters and carriers are the greatest patrons, and they hardly ever suffer from glanders amongst their horses. A friend of mine, once attached to the Veterinary College, relates the following:—"One summer's afternoon I walked to King's Cross. At the bottom of College-street is a drinking trough, and just as a peculiarly-colored horse finished drinking, and was led away up the street, a costermonger pulled up his barrow laden with water cress and other green stuff. The sun was hot, the vegetables fading, so, with both hands, he splashed the water from the trough over the green stuff until he considered it sufficiently soaked. The incident would have been forgotten, but on my return to the College I found a horse tied up in the yard, which I

at once identified, by its peculiar color, as the one I had seen leaving the water trough. I enquired what was wrong with it, and was told "a rank bad case of glanders." I refrained from green stuff for some days, and ever since have been shy of vegetables retailed from barrows in very hot weather."

Doubtless it is possible for public water troughs to spread glanders, but they are not a frequent method of spread, and they are otherwise of such benefit to animals that the right thing to do is not to close the troughs, but to stamp out the disease.

The greatest number of reported cases in the counties, outside of the Metropolis, are seen around London. The method of spread to account for this is two-fold. 1st.—The speculative purchase of "suspicious" animals by men who have sheds and fields in which they think they can keep and successfully treat such cases; and 2nd—sending "patched up" cases out to grass with a hope of making the cure more permanent.

There are two methods of spread which are popularly supposed to be common—infection through the air, and infection of buildings.

Infection through the air I do not believe ever occurs. The poison is not volatile, and does not permeate the atmosphere of a building. The fact that the lungs are always affected in developed cases, and fre-

quently in cases where hardly any other portion of the body shows signs of disease, is not evidence of infection through the air inspired. It matters not how the poison enters the system, it soon locates itself in the lungs. As to infected buildings spreading the disease I am very sceptical. I have known stables, in which glanders has prevailed for months, closed for only a short time, and then re-filled with horses after merely an ordinary cleaning, and yet no sign of glanders arise in the new stud. I do not deny that glanderous matter may be left adhering to the mangers and stalls, and that it may become dried and maintain its vitality for a short time, but I do not believe that the poison will remain active, even in a dry form, for over six weeks; whilst in a damp stable I should expect it to lose all power in a few days. Ordinary washing and scrubbing will destroy and remove all infective material, but the addition of some good disinfectant will of course make surer work, whilst painting or hot lime-washing will effectually purify. Attention to the floors I consider the least worthy of notice. The worse the flooring, the more moisture and decomposing matter we find on it and in it, and these conditions are themselves inimical to the preservation of glanderous poison.

The spread of glanders might possibly be furthered occasionally by railway horse boxes. I am aware that

they are tolerably well kept and cleaned by the Companies, but in times of pressure, such as when fairs, markets, and shows are being held, no time is possible for systematic disinfection. More than once I have known glandered horses sent to London in horse-boxes, unsuspected by the railway officials, and doubtless cases have occurred of which I have never heard.

Sale yards do not spread the disease by being infected, or by having visibly affected animals on the premises. The proprietors are most careful and much more likely to reject a horse for some symptom of an innocent nature, than to admit any animal showing signs of the developed disease. They may, however, be the innocent means of spreading glanders by selling horses which show no sign of the disease, but in whose system it is latent, and will develope after a while—it may be in a few days, or it may be not till weeks or months have elapsed. Nothing will prevent this until the law prohibits the sale of horses from infected premises, and for some time after the appearance of the last case.

One more method of spread, or rather introduction, I must refer to—the possibility of importing diseased animals from abroad. We have had glanders introduced into England both from Europe and America, and we are always liable to a repetition of it. There is no power to quarantine, and the latent form of disease cannot always

be detected by an expert, even if horses were submitted to the same examination as cattle. We are liable also to the introduction of the disease from India or Egypt by our army horses. Fortunately these are now well looked after, and its spread to civilian stables is not very likely to be allowed. The almost universal method of spread is the living infected horse on the premises. All other methods are simply communication of the poison by means of objects which convey it with little loss of time, from diseased to healthy animals. In all cases the means of infection is the special glanders poison, in most cases the mode of its carriage can be traced, but in a few the method of spread is overlooked.

How to prevent it.

So long as glanders is allowed to exist to the extent it now does in London and the large provincial towns, it is impossible by any amount of care to prevent, with certainty, its advent to a large stud which is being constantly kept up in number by the addition of new purchases. Studs of working horses are constantly changing, and about one-fifth of the animals are always more or less recent purchases. With the new horses it is possible to introduce the disease, owing to the difficulty of detecting glanders in the latent form. To guard against this, care must be taken to examine all new

purchases, but an even more effective action is—to avoid buying from all sources from which there is a probability of purchasing an infected animal. Sales of cab stock, and cast horses from tramway, omnibus, and railway companies should always be viewed with suspicion, and enquiries made as to their history. When no special unsoundness or vice exists in such horses, they are doubly suspicious, as it may be safely inferred that workable healthy horses, are never cast from working studs. A few years ago I should have advised cast army horses to be treated with equal suspicion, as more than one case of infection traceable to them has come under my notice. Recently, greater strictness, or rather, perhaps, a more enlightened procedure has been adopted in the army, and glanders is now almost unknown, except when introduced from India or Egypt.

Owners of studs, in which glanders exists, or has only recently been got rid of, may contribute to their own and others safety by never selling "patched-up" cases, or horses which have been in contact with diseased ones. They may, and they ought to, prevent others from being guilty of such selfish, cowardly, and immoral action. It is simply disgraceful that such a practice should be resorted to by large joint stock companies and wealthy proprietors. It is only the bare truth to say that such things are done daily, because the law takes

no cognizance of it except upon clear proof of fraud or criminal negligence—proof, the nature of these cases renders almost impossible to obtain.

Next to care in purchasing horses, prevention is best assisted by periodic examinations of all the stock. It is often possible to pick out and separate a horse before he has developed symptoms of any contagious change. It may be too late when some discharge of an infective nature has commenced. In all well organised studs every case of sickness should be immediately removed from the other animals. There are few departures from health that are not materially shortened or benefitted by removal to a good loose box, and this simple economy enables contagious diseases to be detected and isolated before the mischief spreads. Through the treatment of a supposed case of blood-poisoning, in the stable with other horses, I once saw nine cases of glanders within six months. These horses were worth £30 each, and not one would have been infected if the first case had been properly removed and isolated. It is too late to find out the nature of the disease when other horses have been poisoned. The false economy of crowding horses into premises so that no spare stall or loose box can be obtained, always brings its own reward, and the saving of shillings loses pounds.

With every precaution an outbreak of glanders may

occur, and then the question is—what steps to adopt to prevent its spread? These may be shortly stated thus: —

Early recognition of the disease.

Early isolation of infected animals.

Immediate destruction and removal of diseased horses.

Care that no contagion is conveyed by food, water, or stable utensils.

Cleansing and disinfection of the whole premises.

No common and indiscriminate use of harness or nose-bags.

All trades or callings which require the passage through their premises of strange horses, should take especial care not to harbour animals presenting any signs of a suspicious nature. Railway companies should refuse to carry horses with any nasal discharge. Sale yards, I find, are most particular as to the health of animals admitted, and thus endeavour to protect themselves and their clients. I fear the same care is not exercised by innkeepers and livery stable keepers, nor by farriers, as to the horses coming on to their premises and mixing with others. Of course, I do not suggest that every animal suffering from a common cold should be refused admittance, but I do say that some care should be exercised to distinguish colds from graver maladies, when other animals may have to occupy the same stall, and use the same manger as the affected one.

There is just one broad principle to follow in making rules for the prevention of glanders—to remember that every case is due to a specific poison gaining entrance to the system of a horse; that this poison is only derived from glandered horses; and that we should endeavour to destroy that poison, and prevent its conveyance from one horse to another. It is well to remember that bad stable management, and all causes giving rise to fever or debility in horses, makes them more susceptible to attack, but these conditions are not to be looked upon as *causes*, nor allowed to distract attention from the only real and essential cause—contagion.

When the disease through not being recognised sufficiently early, or from any other cause, has spread; when a number are visibly diseased, and an unknown number possibly infected, the adoption of most stringent measures for stamping it out is the only economical course to pursue.

How to Stamp it out.

I have attempted to show that glanders is a disease which arises from a contagious poison derived from a glandered animal. If this be true we have only to destroy every glandered horse, at the same time preventing further contamination of healthy stock, and the disease becomes extinct in this country.

The acceptance of this theory is the basis upon which all interference by the State must rest. The Act of Parliament undoubtedly interferes with the liberty of action of the subject, and with the way in which he must use, or disuse his property. The interference would be intolerable if it were not based upon a conviction that it was good for the public, and not injurious to the individual. Glanders is incurable, its existence is a source of danger to man and other animals, therefore there is no hardship when the State compels the slaughter of diseased horses. Unfortunately, that form of glanders called farcy may, in a few cases, be "patched up," or apparently cured, so that its existence is for a time concealed, and some months' work may be obtained from the horse. This fact is illogically supposed to supply a reason for a distinction in the treatment of the two forms of disease, and compulsory slaughter of farcy is not enforced. These half-cured cases of farcy—due, remember, to the identically same poison as glanders—exist in comparatively large numbers, and thus a stock of the specific poison is kept alive and active. Constant living sources of glanders-poison are kept in stables, sold in auctions, worked in the streets, and sold and bought with the tacit permission of our legislature. Under the existing Act then it is simply impossible to stamp out glanders, we can only partially suppress it.

The law is discredited because it fails to do what it professes, and the horse owner, beginning to doubt the efficacy of any State regulations, becomes careless in obeying them. So long as farcy exists, the poison of glanders is preserved, and the spread of glanders inevitable.

In individual stables, however, the existing regulations, combined with intelligent effort on the part of the proprietor, are sufficient to stamp out the disease. Let us suppose the case of a yard, containing a hundred horses, in which the loss from disease has been great, and in which it is still prevalent—the mortality being two a month, *i.e.*, more than the average loss from all other diseases put together. Owing to the prolonged period of latency in some cases, we must not expect to stamp out glanders all at once. Probably two years must be counted on for its complete extinction, but six months will be long enough to get rid of nearly all infected animals. For the longer period, watchfulness to detect the very earliest sign of any disease is necessary. For the shorter period, constant attention and unremitting care is essential, with perhaps some interference with the ordinary routine of the stable. It is very difficult to persuade men to adopt the necessary measures, and still more difficult to get the details carried out when no marked case of disease is apparent. The result is that

attention is relaxed, and too often some unsuspected case arises, and is not detected until it has infected another horse, and again the outbreak increases. If the stamping out of glanders in a stud is worth doing at all, it is worth doing thoroughly. The loss entailed by the disease is enormous, by proper measures it can certainly be got rid of, and the cost of doing so is comparatively slight. The means to be adopted are as follows :—

Examinine every animal.—The object of this is to detect any sign of disease.

Separate all suspicious horses.—By "suspicious," I mean those that present any sign, however slight, of disease. Probably some will be separated which have no infection in their system, but it is better to err on the side of safety, especially when the separation can do no harm further than, perhaps, some slight interference with the stable arrangements. The separation does not interfere with the animal's work, and is nothing more than setting aside one special stable for all such horses, and keeping them there until they either develope further symptoms, or regain a perfectly healthy appearance. Where horses work in pairs, and the suspicious symptoms are slight I remove the pair, but if the symptoms are very suspicious I break the pair, and leave the healthy horse to be matched as best it can.

Isolate all very suspicious.—When the symptoms

are of such a character as to not positively indicate glanders, but yet to strongly suggest it, the horse should be isolated from all others in a loose box, or in a small stable kept for that purpose. Too often these cases are treated with a view to the amelioration of the symptoms, instead of by measures calculated to define them. What we want is not to hide the symptoms, but to be sure of their significance, and, therefore, we save time and avoid future danger by adopting means likely to develope the symptoms. One of these means is very simple—the administration of a strong dose of aloes. I need hardly say this course is not adopted when the symptoms contra-indicate it. All horses which have been isolated should only return to the working stud, if their symptoms clear up, after a time spent in the separation stable so as to make sure of their condition.

Slaughter all diseased.—About slaughtering well developed cases of glanders, no one hesitates, but there is often delay over cases in which no ulceration in the nose can be seen, and there is positive refusal to slaughter cases of farcy. Now delay is nowhere more dangerous than in the disposal of horses suffering from glanders. As soon as we can be certain that a horse has glanders poison in his system, true economy is served by his destruction, whether the signs of disease are evidenced by farcy or by glanders. There must be no

hesitation—no calculating the possible resumption of work, or the chances of a temporary cure. Glanders cannot be stamped out if we keep horses on the premises in whose system the contagious poison exists, but who only evidence it in the form called farcy. The first loss is the least. The value of the one horse can be estimated, but it is impossible to estimate the probable loss by a further spread of infection. Infected studs in which farcy is treated never become clean, but success is always attainable by the rational method of destroying every infected animal as soon as the signs of disease are such as to indicate positive infection and power to infect others.

Separate all horses in contact with diseased ones.—When a case of glanders or farcy is discovered in a stable in a form capable of infecting others, *i.e.*, with a discharge from the nose, or an ulcerated farcy "bud," or even with diseased lungs, it is probable the horses on either side of him may be infected. It is even more probable that animals using the same nose bag or manger may be infected, and, therefore, it is a safe practice to at once separate all horses which have been in contact with diseased ones. All the horses separated may not be infected; their removal does them no harm, and can only cause some little inconvenience, but it ensures that if they are infected they shall not be in a position to further

spread the disease when it developes. If every case of glanders gave clear warning of its approach, there would be no necessity to separate all horses which, by contact with diseased ones, might possibly be infected, but we know too well how insidiously, and often suddenly, it makes its appearance. We know too, how easily infection is spread, and we therefore take such measures as may lead to its earliest detection, and such as are most likely to stay its spread.

Cleanse and disinfect infected premises.—The poison of glanders retains its vitality for some time out of the system of a horse, and may thus remain adherent to mangers, walls, wood-work, nose bags, harness, etc. All such objects then, upon which a glandered horse may by any possibility have left any virus, must be cleansed and disinfected. Nothing facilitates the removal of the infective discharges so much as moisture, and, therefore, all suspected objects should be soaked for some hours in water. Stalls, walls, and bales may be sluiced down with a few pails of water, and left all night. After the soaking, hot water, soda and a brush will effectually remove all infective material. Without this cleansing disinfection may be a failure, with it we ensure success. For my part I would always sooner dispense with the disinfection than with the cleansing, but both are good, and combined are of unfailing

efficacy. Carbolic Acid, Creosote, Chloride of Zinc, Chloride of Lime, Permanganate of Potash, are all effective disinfectants, so, too, is fresh made hot lime wash. Where a boiler is available, no more effective disinfection can be had than tightly closing the stable and filling it with steam for a few minutes. Boiling water, too, is a most potent disinfectant application for mangers, wood-work, etc.

Repeat examination of stud frequently.—As glanders may remain latent in the system for a long time, and be developed suddenly, it is necessary to frequently examine every horse in a stud which has once been infected. The horse keepers may be trusted to report every morning any deviation from health, but an expert should examine at least once a week, to make sure that no symptom has escaped notice. The weekly examinations should extend over a period of at least three months, and may then be altered to one at longer intervals.

Mark every animal for identification.—The simplest way to do this is by branding a number on the hoof. Unless animals can be identified, it is impossible in a large stud to follow them. When numbered it is easy to trace their history, especially with reference to what stalls they have stood in, and what other horses they have been in contact with.

Arrange in studs or lots.—When a contagious

disease exists amongst horses or other animals, they should be so divided into small groups or lots, that any developement of disease may be limited as much as possible. Omnibus horses work in studs, cab horses in pairs, and where glanders is suspected no alteration of studs should be permitted after the first arrangement, when all suspicious animals have been separated.

Note position in stable of each horse.—Having numbered or marked every horse and arranged them in the stables, a plan of the stalls should be made, and each horse's number placed on the position of his stall. Every change of position should be noted, and none permitted except what is absolutely necessitated by the working arrangements of the business. By doing this we are often assisted in tracing the spread of the disease, sometimes in detecting an infected case which the examination had not brought to light. When a diseased or suspected horse is separated from the stud, his place on the plan should be marked in red ink, and thus a record is kept of the position of each outbreak, and of the horses most exposed to the probability of infection.

Have no common drinking trough.—There is always a possibility of overlooking a case of intermittent discharge from the nose, and of such an animal conveying infectious matter to the vessel out of which he drinks. If this vessel be common to other horses, the harm done

is indefinite. Until the whole stud is probably healthy, all water should be supplied in pails, and each stud or lot should have their own separate pails.

New horses must be kept separate.—To maintain a stud of working horses necessitates constant purchases of new animals, which should be kept distinct from the old ones until it is certain that the disease is extinct. Unless this is done an outbreak of glanders may be prolonged indefinitely.

By rigidly acting up to these rules, glanders may be stamped out of any stable. The time required may be long or short, but with care to prevent fresh infection, it only extends to the longest period that the disease may remain latent in the system. The majority of cases will be detected within six months, but it must not be forgotten that, in a few exceptional cases, disease will not be made evident—although infection has taken place—for perhaps two years.

What can be done in one stable can be done in any number, but as the proprietors are different, and their interests diverse, it becomes necessary for a superior power to enforce uniformity of action. If each proprietor were allowed to get the disease out of his stable as best he could for his own interests, he would, in most cases, sell diseased and infected animals to other men,

and purchase a new healthy stock. He would not stamp it out, he would simply transfer it to some one else.

The State, therefore, should make regulations to prevent the spread of disease from one stable to another. To do this, it should require a declaration of the existence of disease on any premises; it should enforce isolation of diseased animals and their early destruction; it should compel the proper cleansing and disinfection of infected premises; and it should forbid, for a certain time, the removal or sale of animals which have been in contact with diseased ones, say for at least one month. Nearly all these matters are now provided for by the Act. The declaration of disease is frequently evaded, although doing so entails a risk of fine or imprisonment. It is melancholy to have to say that for this, not unfrequently, the veterinary surgeon attending is chiefly to blame. The professional man knows the law, he knows that his client is responsible, he is employed and paid to do what is best for the owner, and, I feel obliged to say, by not advising the proper steps he is morally guilty of dangerous negligence for which there is no excuse.

The isolation of diseased animals is provided for, but as cases can be half-cured, so that the signs of disease are not evident, many horses are worked and sold in an infected condition. The destruction of diseased horses is only partially carried out. The Act compels the

slaughter of glanders, but permits the treatment of farcy. The result is that cases of the latter form of the malady are constant. The specific poison is in them preserved, and kept active for the future infection of other horses. Disinfection is well provided for by the Act, but you cannot disinfect a living diseased horse, and it seems to me like swallowing a camel and straining at a gnat to compel the disinfection of stalls and sheds in which a glandered horse has stood, whilst permitting a horse with farcy to remain alive, during every minute of whose existence the specific poison of glanders is being actively developed and increased in his system. Restrictions upon the sale of horses which have been in contact with diseased ones (and, therefore, that *may* be infected) there are none. The local authority has power to prevent the removal of horses out of an infected stable, but such powers are seldom used, as they simply mean ruin to the owner of a working stud. Unless they adopt this measure they cannot forbid the sale of horses, and thus it is that horses already infected (but not visibly) are frequently sold, and carry disease to other stables.

The Law concerning glanders.

The existence, movement, and disposal of animals suffering from glanders or farcy, is regulated by the Contagious Diseases (Animals') Act, of 1878. This Act consists of certain compulsory and certain permissive

clauses. It also gives power to the Privy Council to issue Orders which have all the force of clauses of the Act. The regulations in force then, are derived from the Act, and from the Orders issued by the Privy Council. The administration of the Act is entrusted to Local Authorities, who have power given them to make and enforce rules for the carrying out of the provisions of the Act in their districts. In London, excluding the City, the Metropolitan Board of Works is the Local Authority; in Boroughs, the Town Council; and in Counties, the Justices in Session assembled.

It is an offence against the Act

1.—To expose a diseased or suspected animal in a market, fair, or sale yard.

2.—To carry, lead, or drive, or to send, or cause to be sent, a diseased or suspected animal along a highway or thoroughfare, or on a railway, canal, or river, or on a coasting vessel.

3.—To allow a diseased or suspected animal to graze on the sides of a highway, or a common, or in a field near a highway and insufficiently fenced.

4.—To keep an animal suffering from glanders or farcy on any premises without reporting its existence to the police.

5.—To obstruct the police or inspectors in the performance of their duties.

The penalties for offences are a fine not exceeding £20, or imprisonment with or without hard labor for a period not exceeding one month.

No action can be taken under the Act unless within four months after the offence.

When the owner reports the existence of disease, the inspector of the district must attend and examine the animal. If it is found to be affected with glanders or farcy, it must at once be separated from other animals, and if the owner agree, the animal is slaughtered without delay, and must then be disposed of by the Local Authority, either by burial or destruction. If the owner object to have the animal slaughtered, he may keep a case of farcy so long as it is properly isolated, but in the case of glanders, the Local Authority may, after 14 days enforce slaughter, and charge him with the expense.

The Local Authority may give public warning by placard or advertisement of the existence of disease; may prohibit the movement out of an infected stable, building, field, or other place, of healthy animals which have been in contact with affected animals; and may make regulations for the taking out of any stable or other place of any fodder, litter, or other thing that has been in contact with, or used for or about any diseased or suspected animal.

Any police officer has power to detain or arrest,

without warrant, any person guilty of an offence against the Act.

An inspector under the Act has power of entry on to any premises, when he has reasonable grounds to suspect the existence of diseased animals.

No fee or other charge may be demanded or made for any declaration, inspection, certificate, or license, under this Act.

An informer may claim half the penalty imposed, as the result of any conviction obtained by his action.

A person charged with not giving notice of the existence of disease, is presumed to be aware of the state of the animal, until he shows to the satisfaction of the court before which he is charged, not only that he had no knowledge thereof, but, also, that he could not with reasonable diligence have obtained that knowledge.

Requisite amendment of the Law.

Legislation is never effective when based upon sentiments or principles much in advance of popular appreciation. Until veterinary surgeons and horse owners are inclined to co-operate with the authorities in stamping out glanders, and preventing the spread from one stable to another, great difficulty would be experienced in enforcing much more stringent regulations than may now be put in force under the Act of 1878.

When the Act was passed a large number of experts believed that although glanders was incurable, farcy was in many cases amenable to treatment, and horse owners willingly kept horses suffering from farcy, hoping they would again be able to utilise their labour. It is quite true that many cases of farcy do yield to medical treatment, so far as to recover from all external signs of the disease, and to resume work. Very few, however, exist more than a year without again developing the disease in a worse form—in a form, almost without exception, terminating fatally. Men possessing any experience of the disease, know that a horse suffering from farcy is capable of infecting other horses with glanders—in other words that both diseases are due to the same specific poison. The difference then between the two forms of disease is not one of nature, but of degree and position. They are both contagious, and, practically, both incurable. The Law enforces the slaughter of one, but permits the treatment of the other, with the result that owners are allowed to keep alive infected horses in whose systems the poison of glanders is being constantly developed and increased. So soon as this living poison-factory ceases to show any external signs of its dangerous infective power, the law permits it to be worked, sold and moved to other stables, where its condition is unsuspected until probably other horses are infected. The

spread of glanders is dependent almost entirely upon its being carried by living horses suffering from the disease in a latent form, and therefore every effort should be made to prevent the movement and sale of such animals. The treatment of farcy with its resulting disguise of the disease—its temporary obliteration of the symptoms—manufactures glanders in the latent form. It is thus doubly pernicious—it keeps alive a stock of the specific poison, and it causes its dissemination by animals which, for a time, offer no sign of its existence.

It is easy to see why the Act was thus lenient. Its framers knew that popular knowledge was, at that time, unable to appreciate the importance of thoroughly stamping out the disease by destroying every source of infection, and they knew that so long as a belief in the curability of farcy existed, horse owners would not co-operate with the authorities, and assent to the slaughter of a horse they had reason to believe would soon again render them good service. At the present time the veterinary profession is, with a few unimportant exceptions, quite alive to the fact that farcy and glanders are due to the same poison, and that so long as one form exists, so long must the other. Horse owners too, whose experience embraces an outbreak of either disease, are now convinced that attempts to cure farcy are quite incompatible with the extinction of glanders, and that

the first loss entailed by speedy slaughter of every case is the only economical method of procedure. Selfishness, however, still urges some men to try and save the lives of horses otherwise valuable. When they succeed in removing the external symptoms, caution suggests getting rid of the animal, and so it passes into other hands, and in time causes fresh outbreaks of disease.

This is what must be stopped. This is where the law fails, and a requisite amendment of the Act is one which shall remove the distinction between glanders and farcy, insisting upon the immediate destruction of both forms of the disease.

There are, of course, cases in which diagnosis is very difficult, and the owners of horses have a right to demand that they shall not suffer loss by the impatience or error of any official enforcing the law. The Local Authority is actionable for the negligence of its officers, and would not take any hasty step if the owner backed his objections to slaughter of a horse by the evidence or opinion of an expert. But the Act allows full time in the case of glanders for anyone to arrive at a definite and correct diagnosis. Only after fourteen days' notice can they compel slaughter, and that period is ample to allow the nature of any case to be, in more ways than one, positively demonstrated.

I am convinced that if the Act treated farcy and

glanders in precisely the same manner—applied to both the regulations now in force for glanders, we should very rapidly find a great diminution in the disease, and in a few years be absolutely free from it.

By an Order in Council, "suspicious" cases are now subject to regulations as to their movement and isolation. Such cases would remain unaffected by the proposed alteration, and all animals showing symptoms not positively and unmistakably developed would simply be isolated. Only clear cases of farcy would be treated as glanders now is—by enforced slaughter.

It has been suggested that if compulsory slaughter were applied to farcy, compensation should be paid to the owner. I do not think the proposal is fair to the ratepayers, as it would be an absolute encouragement to a certain class of men to negligence and dishonesty, unless the amount of compensation were only a small proportion of the market value of the animal. If the compensation were limited to one-fourth the value of the horse, there is an argument for such a tax on the ratepayers. It would encourage men to report the existence of disease in their studs at the earliest moment, and so would hasten the time at which glanders would be extinct in the country.

Holding, as I do, that true economy is served by destroying every case of farcy as soon as it is detected,

I cannot approve of charging the ratepayer to stimulate men in protecting themselves. If farcy were really a curable disease, if it could not give rise to glanders, I should not suggest its being dealt with so ruthlessly.

The horse owner who will not give notice of the disease, can be dealt with otherwise than by bribes from the ratepayer. The penal clauses of the Act are sufficient if enforced. No need to resort to the Courts and rely upon the paltry fines inflicted by some magistrates. The Local Authorities have power to stop the movement out of or into premises upon which the disease exists, of all healthy horses. They may also placard the premises with notices of its condition and contents. Such powers are seldom used, but in cases where men are detected in systematic evasion of the law they may be adopted, and very few examples would be necessary to intimidate those who, by their negligence and ignorance, keep the disease alive but hidden.

Number of Horses attacked with Glanders and Farcy, as reported in England, Scotland, and Wales, during 1886.

	Counties Infected.	Glanders.	Farcy.
England ...	22	599	477
Scotland ...	2	36*	0
Wales ...	1	1	1
TOTAL IN Great Britain	25	636	478

*Thirty-five of the number here reported occurred in one county—Lanark—and, as might be expected, in the City of Glasgow.

The City of Edinburgh, although returning no cases, is not free from the disease, and has not been for years.

English Counties arranged according to number of diseased animals reported in 1886.

County.	Glanders.	Farcy.	Total.
Metropolis	508	437	945
Middlesex (ex Metropolis)	20	14	34
Essex	11	10	21
Surrey (ex Metropolis)	8	5	13
Sussex	11	2	13
Kent (ex Metropolis)	5	1	6
York	2	3	5
Hertforshire ...	3	0	3
Berkshire	3	0	3
Warwickshire ...	1	1	2
Lancashire ...	1	0	1

Other affected counties simply show solitary cases.

Inferences as to the comparative Sanitary condition of horses in the above counties would be most fallacious. Lancashire would appear to be free from disease, whilst, as a fact, it is badly infected. Liverpool and Manchester alone ought to show 150 cases, but owing to the disgraceful negligence of the Local Authority, diseased horses are not reported and infected stables are never inspected—a very few years ago one firm lost 72 horses in a year and never reported a case. Such neglect is scandalous. The comparatively large number in the Metropolis is due to the Act being better enforced than anywhere else.

Table showing total number of horses reported as attacked with glanders and farcy in Great Britain during last ten years.

Year.	No. of counties infected.	Glanders.	Farcy.	Total of both diseases.
1877	38	494	264	758
1878	49	548	339	887
1879	49	906	461	1367
1880	35	1346	764	2110
1881	30	1095	625	1720
1882	30	858	531	1389
1883	35	705	539	1244
1884	34	643	480	1123
1885	24	538	408	946
1886	25	636	478	1114
			Total in ten years ...	12658

If these figures be multiplied by five a fair approximation to the annual loss of horses from this preventible disease will be arrived at. The apparent increase of the disease in 1879 and 1886, is quite explained by the greater obedience to the law caused by the increased action of the Metropolitan Board of Works taken at those times. If the law were enforced in Lancashire as it is in the Metropolis, some startling disclosures would be made.

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