SELECTIONS

FROM THE

RECORDS OF THE GOVERNMENT

OF THE

PUNJAB AND ITS DEPENDENCIES.

NEW SERIES—No. XX.

TREATMENT

OF

CATTLE DISEASE IN THE PUNJAB.

Lahore:

PUNJAB GOVERNMENT SECRETARIAT PRESS.

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MEMORANDUM.

In April 1882 the Financial Commissioner drew attention to the fact that the records of Government contained a number of valuable reports upon the character of cattle disease in the Punjab, and, in particular, upon the measures which should be taken to prevent the extension of Rinderpest. He therefore suggested that the more useful of these papers might with advantage be printed as a selection and circulated to District Officers. This suggestion was accepted by the Punjab Government, and the Military Secretary was requested to consult Mr. Kettlewell, Principal of the Lahore Veterinary School, and Mr. Nunn, Veterinary Surgeon on Special Duty in the Punjab, as to the correspondence which might most profitably be included in the selection proposed. In accordance with the recommendation of these officers it was resolved to circulate the papers included in the first eleven pages of the present selection. The letter printed at pages 12 to 18 was received subsequently. And as it contains many valuable particulars the Lieutenant-Governor has directed that it should be added to the papers already chosen.

The selection thus completed is now circulated for the information of all District and Divisional Officers, and others who are likely to be interested in the subject.

It has been decided that correspondence relating to cattle disease (as distinguished from correspondence relating to horse-breeding and the diseases of horses) shall for the future be conducted in the Agricultural Department of the Civil Secretariat. Mr. Nunn, Veterinary Surgeon on Special Duty, has been instructed to submit his reports

to the Commissioner of Settlements and Agriculture who has been charged primarily with the duty of dealing with the matter in its administrative aspect subject to the control of the Financial Commissioner and of Government. A number of questions are still waiting for decision. Among these the most important are, can cattle disease be checked or exterminated by special measures of legislation? If so, is it advisable to have recourse to such legislation, and upon what lines should it be framed? How may cattle doctors be best trained, and the services of trained men be rendered most useful within their respective Districts? In what way may information on the subject be most conveniently collected and diffused? And lastly, may not the recent discoveries in Europe of the benefit of inoculation by comparatively harmless germs be utilized to check the ravages of cattle disease in the Punjab? Some time must necessarily elapse before these questions can be considered and decided. Meanwhile it is thought that the circulation of the present selection may not be altogether without utility as it is hoped that it will induce some officers of Government to give special consideration to the above inquiries, and to favor the Government with their views regarding them.

C. L. TUPPER,

Junior Secretary to Government
Punjab.

LAHORE, 31*st May* 1883.

TREATMENT
OF
CATTLE DISEASE IN THE PUNJAB.

CIRCULAR No. 27 of 1879.

Dated Lahore, 16th June 1879.

From—The Secretary to Financial Commissioner, Punjab,
To—All Commissioners and Deputy Commissioners, Punjab.

Cattle disease.

At the request of Government, the accompanying rules for the treatment of cattle disease, and a memo. of the symptoms of the two kinds of disease, cattle-plague, or rinderpest "*taka*" or "*zamat*," and foot-and-mouth disease "*mukh-khur*," drawn up by Veterinary-Surgeon Queripel, are circulated for information.

2. Vernacular copies, in Urdu and Punjabi, will be supplied for distribution through Deputy Commissioners and District Committees.

RULES FOR THE TREATMENT OF CATTLE DISEASE.

1. On the appearance of cattle-plague or foot-and-mouth disease (*taka* or *zamat*) in any village, notice should at once be sent to the Deputy Commissioner, through the Tahsíldár.

2. A reward of Rs. 5 will be given to whomsoever may bring the first intelligence when it is confirmed.

3. Immediately on its appearance, a piece of ground outside the village should be set apart, and every affected animal must be sent there. This piece of ground should be well removed from any line of traffic, and should be to the leeward of the village (that is calculating on the prevailing winds), as infection is likely to be conveyed in the air.

4. According to the number of animals attacked, one or more men should be employed by the villagers, whose sole duty should be that of tending the cattle. No other persons, on any consideration, should be allowed near the cattle, and no person and no thing should be permitted to leave the place. All excreta, &c., that can be burnt should be disposed of in this manner; the rest should be buried in the same manner as hereinafter laid down for the disposal of carcasses.

5. On the death of animals, the hide should be deeply slashed with crucial incisions, and the whole buried to the depth of 4 feet; quicklime to be thrown over it. Place of burial to be as close to the place of isolation as possible.

6. No convalescents should be allowed to leave until 3 weeks after recovery. Whilst ill, an animal should be given as much sattoo gruel in lieu of water as he will drink. This is necessary to obviate the emaciation, in which animals are generally to be found on recovery. When in a weak condition he should be given:—

Native wine	...	2 ozs.
Chiretta	...	2 drs.
Gruel	...	1 pint.

7. The place in which an animal has become affected, prior to removal, should be disinfected in the following manner:—All ground of floors, mangers, &c., to be removed and replaced by fresh; wooden work to be covered with quicklime. Fumes of sulphur to be extensively used. The clothes of the attendant to be well boiled before he is allowed to go near any other animal.

8. The fact that a village is infected should be widely proclaimed to surrounding villages; and the zamíndárs warned not to allow any cattle from the infected centre to approach the healthy village. All traffic should be stopped as far as possible, and all fairs suspended.

9. On the termination of outbreak any temporary structures, &c., which may have been erected on the place of isolation, to be burnt. The place to be thickly strewn with quicklime, and then deeply ploughed.

10. Isolation to be, also, carried out in the case of foot-and-mouth disease (*mukh-khur*). When the animal is first seen to be suffering from foot-and-mouth disease, give—

Epsom-salt	...	8 ozs.
Nitre	...	2 ozs.
Gruel	...	1 pint.

The mouth to be washed with weak vinegar and water in the first instance, and, when ulcers have formed, to be dressed with alum lotion 2 ozs. to the pint. When the feet are affected, keep them perfectly dry, and give the animal soft standing ground. Ulcers in the feet to be dressed twice a day with powdered alum. If in milch cows, keep the udder clean, and, if very painful, foment it.

11. In both diseases most scrupulous cleanliness is required.

12. Any person neglecting to take reasonable precautions and causing danger or loss to the cattle of other persons, will be liable to prosecution for nuisance under the Indian Penal Code.

Symptoms of Cattle Disease.

The symptoms of cattle-plague or rinderpest, *taka* or *zamat*, and foot-and-mouth disease (*mukh-khur*), respectively, are described by Veterinary Surgeon Queripel as follows:—

Symptoms of cattle-plague or rinderpest.

Cattle-plague is a febrile disease affecting mainly the mucous membranes of the body; it is of a highly contagious nature, and from researches made by eminent authorities, as well as from experience gained during investigations of various attempts made by myself, it would seem to rely solely on contagion and infection for its introduction, each animal newly affected becoming a focus from which it can be disseminated.

This disease is most insidious and difficult of detection in the primary stage; and, as it can only be arrested by timely recognition, I fear that, until *salutris* are properly educated and posted in various parts of the district, little can be done. I shall allude more fully to this subject in my final report, and will then specially urge this measure to be carried out; feeling convinced, as I do, that until such men are employed, the zamíndár will continue to place his faith in charms and fakírs. The symptoms which I observed in most of the animals, and which I have recorded in my notes appended, are:—

First, febrile symptoms.—Horns and extremities at times hot, at others cold; signs of fatigue and weakness; ears, drooping; shivering; great thirst also seemed a constant symptom. And although only these symptoms may be visible, still it should be remembered that these animals are able to communicate the disease to others in a virulent form: after almost 24 hours, suspension of rumination and loss of appetite ensue, coupled with a discharge from eyes, nostrils, and, in the case of cows, from the vagina. If the mucus membrane of these organs be examined, they will be found to be very highly colored. This stage is then followed by diarrhœa, the fæces being of a jelly-like consistence, much mixed with mucus, and at times with blood. Frequently animals in this stage show signs of abdominal pain. The animal thus affected soon dies. I have only alluded to symptoms which can be understood by any ordinary Native, and have tried to avoid all technicalities, reserving such information until my final report. The duration of the disease seems to vary; but, as a rule, the animals affected die in about six days, although I have seen well authenticated cases in various villages which were in a dying state and had been ill for 12 days.

It must be remembered that the virus of this disease is of the most subtle kind; it may be communicated by actual contact or be carried by the air. The articles which I would name as being most liable to convey the disease are manure, forage, hides, and lastly persons, as it may cling to their shoes and clothes. Birds and pariah dogs are also great sources by which the disease is spread. I shall again allude to this when speaking of the disposal of carcasses.

Symptoms of foot-and-mouth disease.

This disease varies from that of cattle-plague in being readily recognizable. Usual febrile symptoms, accompanied by slight constipation; and, if in milch cows, the secretion of milk is at first diminished, and becomes gradually suspended. This is followed by eruptions in mouth, which have the appearance of blisters: these soon break, leaving unhealthy ulcers. The same class of eruption may appear on the udder and teats; when the feet are effected, the coronets are first noticed to be hot, and the animals are lame. The same class of eruption then appears in various parts of the foot, especially betwen the digits.

Extract, paragraph 6, from letter No. 807 S., dated Ráwalpindi, the 24th December 1880, from Veterinary Surgeon J. A. Nunn.

6. *Remedial measures.*—It is utterly useless trying to prevent the spread of the disease through the country by pouring medicine down the throats of the animals that are ill. If it is desired to put any check on it, measures must be taken to prevent the disease spreading, and not to attempt to cure animals when they are ill; and it is to be borne in mind that so subtle is the virus that even an animal that is itself recovering from cattle-plague in a mild form, is capable of conveying it in a virulent type to others. In England, during the outbreak of 1865-66, the extreme measure of stamping out, by the immediate slaughter of all infected animals, and those that had been in contact with them, was resorted to; but, of course, in a land inhabited by Hindús this could not be carried out. The only method that can possibly do any good is by the strictest supervision of all trade routes into the country, the inspection of all imported cattle, sheep and goats, and their products, such as hair, raw hides, wool, tallow, hoofs, horns, &c., and the careful isolation of all infected places. The country should be divided into districts, and over each a *salutri* be placed under proper supervision. A reward should be given to the person first reporting the disease as soon as its existence has been ascertained; and any one suppressing this information, or neglecting to give it, should be severely punished, exception of course being made where ignorance can be proved. On the outbreak of the disease the *salutri* or person in charge of the district should at once proceed to the spot and carefully inspect all animals belonging to the village, of which a description list with the owner's name should be made out. All sick animals should be carefully isolated in a place outside, at least a quarter of a mile from any highway or building inhabited by cattle, sheep or goats. In hill villages, like those of the Kángra District, it should be remembered that the site of this place of quarantine should be as far below the village as possible, in order that drainage may not soak down and contaminate the places below it. If, however, a village is situated low down the side of a hill on the banks of a stream, as many are in the hills, then on no account should diseased cattle be placed near it, as the drainage conveyed by water is one of the most certain ways by which the contagion is spread. Should the village be, as I have described, low down on the banks of a stream, then the safest place would be on one of the plateaus that are to be found up the sides of the mountains; but as this necessarily would be some way from the infected spot, the greatest precautions would have to be observed in clearing any fæces, &c., off the path up to it. A special attendant should be employed about the sick cattle, and no one else should be let to go near them on any pretence whatsoever. They should be watered on the spot, the water being taken from some place not used by other animals. All the fæces, litter, &c., should be collected carefully every day and burned, and the ground dug up. Any highway through the village should be diverted, and any one found using the closed part should be punished. Notice of infected villages should be freely circulated in the surrounding

district. The carcasses of those that die should be buried at least six feet deep, the hides slashed, and the litter, &c., burnt. The roads by which cattle from outside the district are imported should be carefully guarded, and no animal allowed in until it has undergone a quarantine of eight days, the incubative period of the disease. Of course this rule would only apply to cattle coming from districts known to be infected. This, in a hill district, where traffic is more or less compelled to keep to the beaten track, could be done with less difficulty than in the plains, and could also be utilised for the inspection of all exported animals as well. The infected village should not be declared free of disease until thirty days after the last case. The place where the sick animals have been placed should then be carefully dug up, and all litter, &c., burnt. Earthenware vessels used about sick animals should be broken and burnt, and all wood-work disinfected by whitewashing with freshly-made lime-wash.

No. 214-S., dated Ráwalpindi, 14th August 1881.

From—Veterinary Surgeon J. A. NUNN, on Special Duty,

To—The Secretary to Government, Punjab, Military Department.

I HAVE the honor to acknowledge the receipt of your No. 2773 of 10th August, with enclosures. In reply to the first question asked, *viz.*, does one attack secure immunity, I would state that though the question has not been settled beyond dispute, still it has been ascertained that one attack confers immunity for a period of six years. This is the result of a series of experiments that were made in Russia, I believe at Moscow; but as animals are not as a rule allowed in Europe to live for a great number of years, it is difficult to say if absolute immunity from a second attack is insured or not. Still, for all practical purposes, I think that an animal that once has had an attack of rinderpest and recovered from it, may be looked on as secure from a second. In giving this opinion, I would, however, request that it may be distinctly understood that I do not mean that if an animal that has once had cattle-plague and recovered from it, is brought into contact with animals sick with it, and afterwards with those that are healthy, that the disease will not be communicated to these latter. On the contrary, such an animal, although it may enjoy immunity itself, will be just as active an agent in conveying the disease as if it had it in its most virulent form.

2. Second.—Can inoculation be practised safely? I should say most certainly not. The only case in which it is justified is in an isolated country from which there is a large export traffic by sea, or by one or two well-defined roads, in which case it might be tried with those animals that are to be sold. As a measure for preventing its importation into other States, experiments were made by the Russian Cattle Plague Commission, in which it was demonstrated that after the virus had been cultivated for 15 generations no mitigation of the virulent principle was obtained. That is to say, that a healthy animal being inoculated from one diseased, and the virus thus obtained being passed through the animals, from one to another, the disease produced in the 15th was of just as violent a type as that in the first, which was naturally infected.

This is a subject to which Professor Gamgee has devoted much attention, and from his experiments he draws the following conclusions. In his report he says:—

1st. The inoculated disease is communicable by re-inoculation and cohabitation.

2nd. My experience would indicate that the animals affected by simple cohabitation with inoculated cattle suffer more than those inoculated, and die in considerable numbers.

3rd. The results of inoculation are seriously aggravated by cold, wet and exposure: the most successful cases have been treated in-doors.

4th. In my opinion inoculation can never be resorted to with success, even in Russia, as a means of exterminating rinderpest.

5th. Means for the cultivation or modification of the virus have proved unsatisfactory, and cannot be relied upon.

6th. Sheep can be inoculated from cattle, and then again cattle from sheep, without modifying the virulence of the virus.

7th. All animals that escape after inoculation without indicating symptoms, such as elevation of animal heat and eruption in the mouth, are not protected from further attacks.

I think that,—if these are the conclusions arrived at by a skilled observer, working with every appliance at hand, and under the most favourable circumstances,—there can be but little doubt what the result would be were inoculation to be tried in this country with the defective machinery at the disposal of the Indian Government. I think, therefore, I have given sufficient reasons against any attempt at its practice.

3. In Mr. Anderson's letter there are one or two matters I should like to draw your attention to.

In Rule 5, which directs graves to be dug 6 feet deep, provision ought to be made for burying the carcass in quicklime.

Rule 10 directs all carcasses to be buried near the hospital-sheds. I think that this is objectionable, and the place of burial ought to be at a lonely spot, some little distance away on the lee side, according to the prevailing wind. The carcass, when removed from the shed, should be slung on a pole, or else conveyed in special conveyance, not dragged along the ground. If a number of animals die and are buried near the sheds, it would greatly tend to cause the contagion to hang about the place. Another measure that ought to be taken is that, after occupation, and particularly after death, the sheds should be disinfected by digging up the floor to the extent of at least two feet, throwing down quicklime, and afterwards putting in new earth that has been brought from a distance; washing all the wood-work with warm water, after first scraping it, and covering it with fresh lime-wash and carbolic acid, if possible. Lastly, burning sulphur in open vessels in the building after the doors, windows, &c., are shut for 24 hours. If it can be done, the houses, stables, &c., from which sick cattle have been taken to the hospital-sheds should be treated in the same way. Mr. Anderson states that one case

of taking bribes by the *salutris* or men on special duty came before his notice. In my letter No. 162-S., of 9th July, I pointed out that this would most likely occur if men were turned out loose into the district. If in a cool climate like Kulu, in which the District Officers can go about the whole year round, this sort of thing goes on, I would ask what will be the result in a district in the plains during the hot weather, where it is hardly possible for a European to venture outside the house in the daytime. The answer to this is more easily imagined than described. As Mr. Anderson truly remarks,—"in Kulu four men can do but little;" and says that ten are required. This increased number even would not be enough, and then they would require the very closest supervision. A District Officer who is one day engaged in making a census, another settling a disputed boundary, and a third hearing a law-suit, has not the time, no matter how hard he works, to see and think about the thousand and one things that are necessary in suppressing an outbreak of this nature. When it is remembered that in England, with a highly-organized department for the special purpose, the aid of the police, the county magistrates, a number of veterinary inspectors, and above all a special Act of Parliament, the disease for nearly two years defied all their efforts; and also in the numerous outbreaks on the Continent, in which even troops have been called out;—when, I say, this is taken into consideration, how can a dozen or so chaprasis, without any proper supervision, except what the District Officer, who has fifty other things to do, can give them *(sic.)*. How can they be expected to produce any good result? Until Government are prepared to take some real and energetic steps in the matter, and form a proper department for the suppression of contagious diseases in animals, no good will ever be done. Half-hearted measures only tend to mislead, and are simply throwing good money after bad.

4. I return the original correspondence herewith.

No. 25 P. G., dated Camp Ráwalpindi, 7th November 1881.

From—Vety. Surgeon A. E. QUERIPEL, Asst. Supt., Horse-Breeding Operations, Punjab,

To—The Secretary to Government, Punjab, Military Department.

IN accordance with your No. 3200, dated 5th instant, forwarding copy of a letter No. 1017, dated 19th September, from Secretary to Government, Punjab, Civil Department, I have the honor herewith to forward the draft of a short Act which, in my opinion, will, in a great measure, tend to prevent the extension of cattle-plague in this Province, which has suffered of late years most severely by the ravages of this most fatal disease.

2. Without legislation of some kind it will, I am convinced, be futile to attempt any remedial measures. I have therefore framed my suggestions in the form of a short Act, and have borne in mind the necessity to make it as little irksome as possible, reserving to the Local Government the power of hereafter framing further rules on transit of cattle, hides, &c.

3. Isolation is the great measure on which we must depend in this country, as owing to caste prejudices the slaughter of diseased cattle cannot possibly be carried out. Still so strongly do I feel on the subject of isolation that I would have no fear in suppressing an outbreak of this disease, if this and other minor precautions were universally carried out by the zemíndárs, whose interests are most at stake.

4. The Act now forwarded is, I feel, imperfect, as my other duties have allowed me but little leisure to consider the matter thoroughly; it will, however, form a basis on which much good may be done. Without it, I feel it were useless to frame any rules and regulations; but should it be passed, I shall be happy to frame a code of rules for the guidance of the district and other officials on whom will mainly fall the duty of seeing that the provisions of the Act are carried out.

5. I would beg to point out the great necessity which will exist of seeking the hearty co-operation of the Rulers of Native States adjoining our districts; and, in the event of this not being obtained, the necessity of totally prohibiting the entry of any cattle, hides, or other articles from their territory, when disease is known to exist there.

DRAFT OF PROPOSED ACT FOR PREVENTING THE EXTENSION OF CATTLE-PLAGUE.

Short title of Act.

I.—The Cattle Plague Act.

Definition.

II.—The term "cattle" includes bulls, cows, oxen, heifers, calves and buffaloes.

The term "animal" means cattle, sheep and goats.

The term "cattle-plague," means the disease known as rinderpest, but more commonly called cattle-plague; also known in vernacular by many names, but more commonly as "*wah*" or "*zaimat.*"

First report.

III.—On the outbreak of the disease, the owner of the animal and the police are at once to report the fact to the tahsíldár or nearest magistrate, who will without delay report the same to the Deputy Commissioner. The latter officer shall then communicate the fact by telegram to the Commissioner of the Division, and also to the Local Government. Any owner of affected animals, or police constable who neglects to report the disease, is held guilty of an offence under this Act, unless he can prove to the satisfaction of the magistrate, before whom he is charged, that he did not know the same to be affected, and that he could not with reasonable diligence have obtained such knowledge.

Declaration of an infected place.

IV.—When such report has been made, the Inspector appointed by the Local Government shall, with as little delay as possible, proceed to the spot; and if he certifies in writing that the disease exists, the place shall be declared an infected place.

V.—The area of an infected place shall include the field, stable, cow-shed, or other premises in which cattle-plague has been found to exist, and all lands and buildings lying contiguous; also an area comprising one mile in every direction from the boundaries of these lands or premises.

Area of infected place.

VI.—If the infected place is on the borders of two districts, the Deputy Commissioner of the district in which the disease originally broke out may, in communication with the Deputy Commissioner of the other district, include in the infected area a portion of that district not exceeding one mile from the boundaries of the infected premises.

Extension of infected place into another district.

VII.—Every declaration of an infected place shall be published in the *Punjab Government Gazette*, and locally every land and householder living within an infected area shall be warned of the fact by the police, who shall be held responsible that this is done.

Notice of declaration of infected place.

VIII.—On a place being declared an infected locality, a careful census of all animals should be made by the lambardár and patwáris, who will be held responsible that it is correct. It should contain all particulars of bulls, oxen, heifers, calves, buffaloes, goats and sheep, together with the owners' names, who, whilst the place is infected, shall report all births and deaths within 24 hours to the lambardár. The lambardár to submit a daily return to the tahsíldár.

Census to be taken.

IX.—All fairs and markets shall be stopped in any district in which there may be an infected centre, and no animal or anything which has been in contact with that animal, shall be moved without license from the Inspector or other competent authority, named by the Local Government, until such district be declared free.

Fairs and movements of animals to be stopped.

X.—If any animal's hide, skin, hair, wool, horn, hoof, offal, carcass, dung, hay, litter, or any other thing is moved in contravention of the rules of this Act with respect to infected places, every person moving the same or causing the same to be moved shall be held guilty of an offence against this Act.

Offences as to infected places.

XI.—The rules of this Act with respect to infected places shall not restrict the moving of any animal or thing by railway through an infected place, such animal or thing not being stopped within the infected place.

Exception for railways.

XII.—On the outbreak of cattle-plague the local authorities shall, in every village in which the disease may appear, appoint a secluded place which, with reference to prevailing wind, should be to leeward of village, as lazarettoes. The lambardár shall be held responsible that all cattle affected are removed to it immediately, special attendants and utensils to be told off, and not to leave until the locality is reported free. All dung, litter, &c., shall be burned daily, and whilst occupied as a lazaretto no person

Formation of lazarettoes.

shall be allowed to enter. The lazaretto shall be surrounded by a temporary fence of thorns or other brushwood.

XIII.—Cattle remaining in sheds and stables from which sick have been removed are to be confined there until the district is declared free.

Removal of cattle from infected sheds.

XIV.—Every shed, yard or stable from which a sick animal has been removed shall be disinfected in the following manner:—All wood-work to be scraped and covered with newly-made lime-wash; the ground of flooring to be removed to the depth of two feet; all walls to be scraped and freshly *lipoed*; all hay, litter, dung, or other article that has been in contact with the diseased animal shall be burnt.

Cleansing and disinfection of sheds.

(NOTE.—For this purpose a quantity of lime should be supplied by local authorities, and as the burning of sulphur in sheds is strongly advocated, a supply of this article is recommended if the expense can be met.)

XV.—No fresh animal to be admitted into any yard, shed, stable or field in which any animal affected with cattle-plague has been kept, or has died, until the expiration of 30 days after the cleansing and disinfecting of such premises, in pursuance of this Act.

No fresh animals to be admitted into infected places.

XVI.—On the death of an animal it shall be buried in some place removed from the village and close to the lazaretto, which should be set apart for this purpose. The depth of the place in which an animal shall be buried shall not be less than 6 feet; the hide shall previously be slashed, and the carcass covered with a sufficient quantity of quicklime.

Burial.

XVII.—Any person who shall dig up or cause to be dug up the carcass, or any part of the carcass of any animal which has so died, shall be held to be guilty of an offence under this Act.

Carcass not to be dug up.

XVIII.—A place shall be declared to be free from cattle-plague at any time after the expiration of 28 days from the disappearance of the disease. The Deputy Commissioner of the District shall report the fact, in order that it may be published in *the Punjab Government Gazette*.

Discontinuance of declaration of infected places.

XIX.—On the place being declared free, a final census of all animals shall be taken. The lazaretto shall be burnt, and the ground strewn with lime and dug up.

Termination.

XX.—An Inspector or other officer authorized to act in execution of this Act may, at any time, enter any field, stable, cow-shed, or other premises within the limits to which this Act may extend, when he has reasonable grounds for supposing that any animal affected with cattle-plague is to be found. He may also at any time inspect any railway truck, boat, or other vehicle proceeding from or passing through an infected district. He may, if he has reasonable grounds for suspecting that the animals

Power of Duty Inspector.

are being moved in contravention of this Act, detain the truck, boat, or other vehicle, reporting the matter to the nearest magistrate, who will, if so satisfied, deal with the case in accordance with the provisions of this Act. If any person refuses admission to, or obstructs or impedes such Inspector, he shall be deemed guilty of an offence against this order.

Duties and powers of police.

XXI.—The police shall at all times assist the inspector and shall be held responsible that his orders are carried out. Any police constable may proceed as follows:—

(*a.*) He may apprehend any person found committing an offence against this Act with respect to infected places. He shall take any person so apprehended as soon as possible before the nearest magistrate to be examined and dealt with according to law. A person so apprehended shall not be detained in custody by any constable without a warrant longer than is necessary for bringing him before a magistrate.

(*b.*) He may require that any animal or thing removed from an infected place in contravention of this Act be forthwith taken back within the limits of that place.

Powers to Local Government to frame rules.

XXII.—The Local Government may, from time to time, with a view of preventing the spreading of cattle-plague, make regula tions for the following purposes:—

For prohibiting or regulating the movement of animals and the keeping thereof on commons or wastes whereon there exists a right of common.

For preventing any person from driving animals under his charge on any highway.

For preventing or regulating the traffic of hides or other articles that have been in an infected place.

For providing for the cleansing and disinfection of sheds and places used by animals affected with cattle-plague.

For prohibiting or regulating the entry of cattle or hides into any district from adjoining Native States when cattle-plague is known to exist there.

Evidence of disease.

XXIII.—The certificate of an Inspector to the effect that an animal is affected with cattle-plague shall, for the purposes of this Act, be conclusive evidence in all courts of justice and elsewhere of the matter certified.

Penalty.

XXIV.—Any person infringing any of the provisions of this Act shall be liable to a fine not exceeding Rs. 50, or to a term of rigorous imprisonment not exceeding one month, or both.

No. 110, dated Lahore, 13th February 1882.

From—J. M. DOUIE, Esquire, Secretary to Financial Commissioner, Punjab,
To—The Secretary to Government, Punjab.

WITH reference to your No. 12, dated 25th January, forwarding, for the opinion of the Financial Commissioner, a draft Cattle Plague Act drawn up by Mr. Queripel, Assistant Superintendent of Horse-Breeding Operations, I am directed to reply that Mr. Lyall understands that he is not required at present to discuss the frame of the proposed Act, but merely to give an opinion whether legislation on the lines proposed is practicable and expedient.

2. He considers that legislation of the kind is advisable to provide powers for experimental use. If a clause like Section 4 of the Glanders and Farcy Act were added, an agency could be provided which would be able to do much in the way of enforcing isolation of diseased cattle, burial of carcasses, stoppage of the movement of infected animals, or of the hide, hair, wool, &c., of animals which may have died of the disease. Mr. Lyall understands Section IX. to relate to the movement of animals, &c., from villages actually infected.

3. Some inconvenience and hardship would result from putting the Act in force, particularly at first. But if the Act was found to be successful in its object, the hardship to individuals would be entirely justifiable.

No. 31-252, dated 2nd March 1882.

From—W. M. YOUNG, Esquire, Secretary to Government, Punjab,
To—The Secretary to Government, Punjab, Military Department.

I AM desired to acknowledge the receipt of your letter No. 3762 of the 29th November last, forwarding the draft of a proposed Act for preventing the extension of cattle-plague for consideration in this Department.

2. In reply, I am to state that, notwithstanding the opinion to the contrary of the Financial Commissioner, who has been addressed on the subject, Sir Robert Egerton is of opinion that no such legislative measure can be entertained at present. If it were established beyond the possibility of doubt that the isolation of the affected cattle was a sufficiently efficacious remedy in cases of cattle disease, it might be possible to make provision for enforcing such isolation without imposing restrictions too burdensome or vexatious on the people. But the Lieutenant-Governor believes that this is not the case; and that the experience gained in western countries shows that nothing short of the extermination of the diseased cattle is sufficient to eradicate the disease in its virulent forms. The Lieutenant-Governor is unable to propose so stringent a measure for adoption in the Punjab. The prejudices of the people would be an effectual hindrance to the adoption of such a measure. There are also other minor objections upon which it is not necessary now to enter; and among others, the difficulty of providing the agency for giving effect to the provisions of such an Act, appears to His Honor to be one of the most insuperable. Under these

circumstances, Sir Robert Egerton does not see his way, at present, to taking any action in the direction indicated in your letter.

No. 64 *V.*, dated 11th March 1883.

From—Veterinary-Surgeon J. A. NUNN, on Special Duty,

To—The Deputy Commissioner, Mooltan.

I HAVE the honor to inform you that on the 20th and 29th February I visited the Sárai Sidhu tahsíl of your district with the object of investigating the nature of the diseases that have recently caused such loss amongst cattle. I met the tahsíldár at Talamba, and he furnished me with the police reports relating to cattle diseases for the last three months, and from these I gather that it is not confined to the Sárai Sidhu tahsíl alone, but is spread all over the district of Mooltan, and also ascertained it extended to Muzaffargarh District as well. It would further appear that not only is cattle-plague (rinderpest) rife, but also foot-and-mouth disease (eczema epizootic) splenic apoplexy, &c.

In the police reports the names of the diseases are given, but several of them are in the Mooltani *patois* and are quite strange to me, as I am ignorant of the local dialect; and though I endeavoured to obtain a description of the symptoms, &c., from the lambardárs and headmen who were assembled at Talamba and Sárai Sidhu, they were so confused, and the account of one individual so totally at variance with that of another, that I was unable to arrive at any satisfactory conclusion. I am induced, however, to believe that different names are used in different villages for the same disease; and not only that, but that very frequently wrong names are given by the owners, who are mistaken as to the particular disease their animals are suffering from. As an instance, I may mention that the tahsíldár and all the other natives I met at Talamba stated that the disease known to them as "*peer*" was nothing but that form of foot-and-mouth disease (eczema epizootic) in which ulcers are found only on the dental pad and tongue, the other form in which both the foot and mouth are affected being known as "*munh khor.*"

On the 1st February I was informed that a buffalo was ill from "*peer*" at the village of Rawnípur, near Salarwahan, in the Sárai Sidhu tahsíl. I at once went out and examined the animal, and found it to be a case of cattle disease (rinderpest), all the people being quite ignorant as to what it was. I may as well add that in this village I was told by the headman that there were about 150 head of horned cattle more or less. The owner of the sick buffalo I saw had lost two a few days before, being the first case that had appeared in the place. His house was in the centre of the village, and the cattle were kept in an enclosed court-yard with a shed in the corner. Both the animals he had lost had died in this shed; but still, so ignorant are these people, that not only had the third one I saw been put into the same place, but the door was open and several other animals in the court-yard were allowed free access to the place where this animal was suffering with rinderpest.

Diseases mentioned in the police reports are no less than 15 in number, *viz*: 1 sang, 2 mohara, 3 galghotu, 4 baki, 5 sat, 6 tap, 7 páni lág, 8 chechak, 9 kalawah, 10 jola, 11 zahmat, 12 peer or pir, 13 kapoli, 14 seemak, 15 dysentery. The mortality and extent of these diseases is shown in the following table:—

		Cases.	*Recoveries.*	*Deaths.*
1. Sang	...	28	0	28
2. Mohara	...	362	359	3
3. Galghotu	...	406	68	338
4. Baki	...	552	169	383
5. Sat	...	48	14	34
6. Fever	...	13	9	4
7. Páni lág	...	809	191	618
8. Chechak	...	189	149	40
9. Kalawah	...	129	4	125
10. Jola	...	1	0	1
11. Zahmat	...	13	7	6
12. Peer	...	3	0	3
13. Kapoli	...	1	0	1
14. Seemak	...	29	9	20
15. Kaunsi	...	1	0	1
16. Dysentery	...	1	0	1
		2,585	979	1,606

By this it will be seen that the deaths are 1,606, recoveries 979, and cases attacked 2,585, the most fatal being those known as páni lág, baki and galghotu. As I have before said, I do not think that there are 14 different diseases rife amongst the cattle of the district, but that many are different names for one disease; many of these names being in the Mooltani dialect are strange to me, and the statements of the zamíndárs are somewhat confused and contradictory.

I have not been able to ascertain the true nature of all, but of such as I have I propose to give a brief description with the treatment and preventative measures to be adopted.

"Sang and sat" appear to be one and the same disease, which is known in the Fens of Lincolnshire as black-leg or black-quarter (carbuncular fever). This belongs to the class of anthracoid or carbonaceous disease that have lately been attracting so much attention both in England and on the Continent. The true nature of these diseases is not yet been satisfactorily ascertained; but, as far as is known, is due to decomposition or disarrangement in the constituent parts of the blood caused by the presence in it of a minute organism only visible under a highly magnifying microscope. The exact nature of this organism or bacteria, whether animal or vegetable, has not yet been discovered; but by experiments performed on the Continent it has been proved that anthrax can be conveyed from one animal to another by direct inoculation into the blood and also by the digestive track, and the mucus membrane, that is to say, by the virus being conveyed in the food and water and in the

air. Flemming, the latest authority in England, writing on the subject says:—"This is the most universal disease we are cognizant of as affecting animals, attacking as it does even birds and fishes: also domesticated as well as undomesticated animals suffer from its effects; though it appears that certain among them have a pre-disposition to its direct primary or spontaneous development. These are the herbivorous mammals, particularly solipeds and ruminants. In carnivorous and omnivorous animals, with the exception of the pig, this mode of production has not yet been fully established, yet it is transmissible to those and to mankind by inoculation and other ways. Anthrax or carbonacious diseases are manifested in bovine, ovine and caperine animals in five forms, *viz.*: 1 black-quarter, 2 splenic apoplexy, which is known amongst natives as "*goli*," 3 abdominal or anthrax, 4 gloss anthrax known as "galghotu," and 5, malignant sore-throat. These primary are all due to dietic errors, one of the chief being allowing the animals to graze on land that is marshy, or that has been flooded, and on exposure to the sun a great growth of rank luxuriant vegetation takes place. It is also caused by suddenly over-feeding animals that had before been half starved."

Black-quarter, which is also known as black-leg, derives its name from the fact that generally it is the extremities that are attacked, and that on a *post-mortem* examination the tissues are found to present a dark or black appearance; it, however, also makes its appearance in other portions of the body.

It commences with high fever, the mouth, ears, and horns being hot, the mouth and muzzle dry, the pulse feeble and irregular and very rapid, sometimes going up to 80, or even 120 beats per minute, and severe shivering fits; swelling appears on the parts attacked, that is, the limbs, quarters, chest, dewlap and ribs, which on pressure emit a cracking sound, due to the formation of gas in the subcutaneous tissues.

If these are cut into it is found that they are full of fœtid gas and black necrosed blood-clots mingled with a thin prurient fluid. The animal rapidly sinks, generally dying in a very short time.

Splenic apoplexy.—The causes of this disease are the same as black-quarter; death takes place very suddenly, the animal that was quite well a few hours before being often found dead, apparently having succumbed without a struggle. Should, however, the disease not have been so rapid in its course, some premonitary symptoms may have been noticed, such as general uneasiness, high fever, hurried breathing, quick irregular pulse, and a dark or red appearance of the urine. These symptoms, after continuing for some hours, subside, but only to return, when generally the animal dies.

Generally in these cases the spleen presents the most striking *post-mortem* appearances,—its internal structure is broken down, the organ is generally enlarged and much distended, being filled with a quantity of semifluid dark tar-like blood. This blood will gravitate to the lowest portion, showing that the tissue is broken down; the liver, kidneys and the mucus membrane of the digestive canal, however, also are somewhat involved to a lower degree.

The abdominal or enteric form, as far as I am aware, is not seen in the Punjab; at least that is my experience up to the present, although it is quite possible that it exists.

I shall therefore dismiss this subject with a few remarks according to Professor Williams of Edinburgh.

The most prominent sign is the passage from the bowels of quantities of dark-coloured blood, and the characteristic *post-mortem* appearances are congestion of the intestinal mucus membrane, more especially of the small intestines, which are covered with *ptechial* spots with incipient ulceration in their centres, extravasations of dark-coloured blood into the canal, *i. e.*, the bowel, and very often extravasations of blood into the sublumbar areolar tissue, the fatty mass surrounding the kidneys being loaded with extravasated blood in a disintegrated, or broken-down condition, or covered with *ptechia*.

Gloss anthrax.—As far as I can at present determine this is the disease known by the local name of "*galghotu*," although in the swelling of the throat that takes place this latter presents some difference. Gloss anthrax differs from the previously described forms of anthrax in the region it attacks, *viz.*, the tongue and fauces, giving rise to the appearance of a number of vesicles on the tongue and palate and even the cheeks.

These vesicles increase in size and at length break, forming ragged indolent ulcers. The tongue is timified and soon becomes swollen and hard; the animal evinces great pain, and there is a copious discharge of saliva from the mouth, mixed with blood, and a thin acrid fluid from the ulcers. All the local symptoms that I have described as accompanying black-quarter are present, *viz.*, constitutional fever, and the animal usually succumbs to the effect of the disease in about 48 hours, if not asphyxiated before.

It will be seen from these remarks that anthrax is entirely a blood disease and caused by defective feeding, and also that the administration of such drugs as could be procured by a zamíndár in the bazár is not likely to have very much effect, and that operations should chiefly be directed to preventative measures. The chief of these would be to induce the farmers to reserve a small quantity of dry food, such as bhoosa or kherby, and give each animal a portion during the period that the grass begins to spring after the rains and also to those that were grazing in marshes. A seton inserted into the dewlap has undoubtedly good result, and in the low-lying parts of England where anthrax is rife is extensively used as a process of precaution. It is a simple operation, and can be performed by any one who is provided with a proper seton needle, which is a piece of flat steel, about 9 inches long, sharp at one end and inserted into a wooden handle; and the other, about a quarter of an inch above the point, an elongated hole is made. The seton can be made of a piece of tape, a strip of cloth, or even thick cord can be used.

The operation is performed as follows:—The animal being secured, a portion of the loose skin of the dewlap is firmly grasped in the left hand and the point of the needle pushed through; it is inserted under the skin, into the loose connective tissue between it and the muscles, for about six inches, and again brought out so that a portion is transfixed.

The tape or cord is then passed through the eye of the needle, which is drawn back, leaving the seton in the wound. The two ends are tied together, or, what is preferable, a piece of wood is tied transversely across each to prevent its being drawn out: this is the better plan, as thorns, &c., are liable to catch in the loop formed if the two ends are tied together. The action of the seton is increased, if the tape is dressed with some irritating liniment, such as turpentine; but if this is not procurable, mustard oil, or chér (pine) oil would do.

The seton should two or three times a week be pulled backwards and forwards, freshly dressed with whatever oil is used, and the wound cleaned. When the disease has made its appearance even in England, with every remedy at hand, the mortality is very great; still, however, if active measures were taken much might be done. The swelling should be fomented with warm water, and the surrounding parts stimulated by being well rubbed with mustard oil, and the following drink to be given: warm ghee 1 pint, country wine 2 ounces, nitre (shora) 1½ ounce; these two latter to be given night and morning in a quart of gruel as long as the animal is ill.

Mohara (eczema epizootic), which is known in other parts of the Province as foot-and-mouth disease.

This disease is of a febrile, highly contagious and infectious nature, characterised by the presence of a number of vesicular eruptions in the mouth, between the cleft of the foot and round the coronet, and in cows at the udder.

The period of incubation varies from 24 hours to 4 days. If common precautions and ordinary care are taken the mortality is almost *nil;* but Natives always neglect their animals so much when ill that the losses are enormous.

When the vesicles in the mouth break and develope into ulcers, the animal is unable to eat hard dry bhoosa or cherry, and literally dies from starvation. The animal when sick should be drenched with gruel made out of atta, or any sort of flour that may be at hand; about a pound mixed in a quart of water should be given two or three times daily, and every other day an ounce of saltpetre (shora) should be put in the gruel.

If the animal will not drink itself, which it seldom will do, the gruel should be given from a bottle or a horn; the ulcers in the mouth should be washed daily with a lotion made of an ounce of powdered alum to a pint of warm water; and those in the feet dressed with powdered alum and well cleaned daily. If these few simple precautions are taken the mortality would be very low indeed.

Baki is said only to attack goats. The animals were described to me as suddenly throwing up their heads, uttering a peculiar bleat, from which the name of the disease is derived, and then falling down dead. These symptoms almost exactly correspond with those exhibited in splenic apoplexy in cattle (called in Hindustani "*gali*"). The treatment and preventative measures would be the same as given under the head of that disease.

Páni lág.—I regret to inform you that I have not been able to arrive at any satisfactory conclusion regarding this disease, which, from the returns given to me, appears to have caused more loss than any other.

It would appear to be caused by cattle drinking the water left in pools and hollows from floods and the rain, and which has become putrid; but whether it is an obscure form of anthrax fever, or is, as the Natives affirm, caused by bad water, I cannot say. It is said, however, to be more prevalent during the hot weather than the cold.

Kalawah, called in other parts of the Punjab "*wah*" and "*zahmat*" is rinderpest, or what is generally known as cattle plague. The symptoms are briefly as follows. But all are not invariably present, and in this country they are often very obscure:—

Rinderpest is a contagious and infectious febrile disease, having an incubative period of from 7 to 14 days. At first but little is seen, except the symptoms of ordinary fever, *viz.*, dullness, want of appetite, staring coat, and in milch cows suppression of the secretion of milk after about 24 hours. The animal begins to tremble, with an arched back and drooping ears, as if suffering from cold; the head is drooping and an unmistakable appearance of illness, purging commences, and eruptions are seen in the mouth, resembling those seen in foot-and-mouth disease; the *membranes* of the eyes are reddened with a thick discharge from them that hangs about the face; there is also a discharge of thick mucus from the nostrils that dries up and impedes breathing.

In the females the vagina assumes the same appearance as the mouth, beginning with a pink color, rapidly deepening to purple, and finally discharging a thick secretion.

In some cases an eruption is seen on the skin, particularly under the elbows, and on the inner aspect of the thighs.

I have therefore come to the conclusion, that the term "*chechak*," which is also used for small-pox in the human being, or any eruptive disease, is only another name for cattle-plague when it assumes this peculiar form.

Another most important symptom is the very peculiar smell about a sick animal that is altogether unmistakable, also the increase in temperature, which in the normal state in the ox is about 100° Fahrenheit, but in cattle-plague is raised to 103° or 104°. As a thermometer is required, and some skill in the use of it, it is not necessary to enlarge on this point. As for treatment, medicines have no effect as specifics, and as from religious scruples it would be impossible to attempt the measures so successfully adopted in England of stamping out, the only precaution that can be taken is that of isolation; and although I have no doubt that if properly and thoroughly carried out, the mortality would be lessened *(sic)*.

Until the Government will frame some legislation and system of enforcing it, it is hopeless to expect any abatement of the disease.

Seemak has only been reported amongst horses from one village in the Alípur tahsíl, and is confined to horses; it is undoubtedly that form of an anthrax fever known as Ludhiána fever.

I regret that I should not have been able to collect further information as to the other diseases mentioned, and also that what I have is so very superficial. But I trust before long to be able to pay another visit to the Mooltan District, and to make a fuller investigation.

SELECTIONS

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OF THE

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