0/9 5,000—5-9-98.

Revenue (1898) Department.

MISCELLANEOUS SERIES.

G.O., No. 4679

DATED 29th November 98

[Despatch Abstract.]

Communicating to the Govt. of Rus
for information & forwarding copies
forwarded by the Govt of India
on the subject of the cattle plat
known as "murrains".

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
		C.M.o 2952/99 = Cno 3602/99		Lr No. 1674 dy	4-5-99.		

0/18 4,500—18-10-98.

Revenue (1898) Department.

CURRENT No. 8024

24-11-98

From

The Government of India—
Rev: & Agri: Dept.

Order issue No. 2467 dy 29th Nov: 1898.

Communicate to the Board of Rev: for information and guidance.

Cir: No. 17—131-4.

25th Nov: 98

Dated 12th Nov: 1898

Received } 23rd ..

Registered }

Enclosures 3

Spare copies.

To
The B.d of Rev: (R.V & Cus.)
Dis. 1-12-98

23-11-98

SUBJECT.

Forwarding copy of the correspondence relating to the cattle-pest known as "warbles" and requesting that the Director of Land Records and Agriculture, Madras, may be instructed to communicate to the Insp.r-Gen.l, Civil Veterinary Dept., any information he may gather on the subject during his tours.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

1898.

File No. 131 of 1898.

Serial No. 4.

GOVERNMENT OF INDIA.

DEPARTMENT OF REVENUE AND AGRICULTURE.

CIVIL VETERINARY ADMINISTRATION.

To

ALL LOCAL GOVERNMENTS AND ADMINISTRATIONS.

Circular No. 17—131-4.

Dated Simla, the 12th November 1898.

SUBJECT.

Ravages caused to hides by the cattle pest known as 'Warbles.'

G. C. Press, Simla,—No. 851 R. & A. D.—15-11-98.—350.

Circular No. 17—131-4.

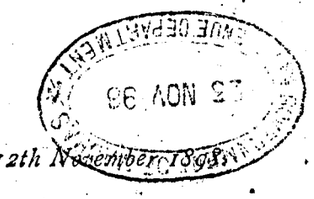
FROM

E. MACONOCHIE, Esq., I.C.S.,
Under-Secretary to the Government of India,

To

The Secretary to the Government of Madras.

Dept. of Rev. & Agri.
Civil Veterinary Administration.



Simla, the 12th November 1898.

SIR,

I AM directed to forward, for information, a copy of the correspondence noted in the margin,* relating to the cattle-pest known as 'Warbles,' and to request that the Director of Land Records and Agriculture, Madras , may be instructed to make inquiries as opportunity offers during his tours, as to the local prevalence of the disease and the customary methods of treatment, and to communicate any information he may obtain to the Inspector General, Civil Veterinary Department.

* 1. Letter dated 4th July 1898, from Messrs. Cooper, Allen & Co., to the Military Department.
2. From the Inspector General, Civil Veterinary Department, No. 286-227, dated 5th October 1898, and enclosures.
3. To the Inspector General, Civil Veterinary Department, No. 2370—131 3, dated 12th November 1898.

I have the honour to be,

SIR,

Your most obedient Servant,

E Maconochie

Under-Secretary to the Government of India.

15 sh. expires by Packet Post.

Dated Cawnpore, July 4th, 1898.

File No. 131 of 1898.
Serial No. 1.

From—MESSRS. COOPER, ALLEN & CO., Government Boot and Army Equipment Factory,

To—The Secretary to the Government of India, Military Department.

The value of some of the best cow hides obtained for army equipment purposes from certain stations in the Punjab is seriously affected by the ravages of an insect pest known as the "warble." During the cold weather months it attacks the backs of the best favoured cattle and perforates them with small holes, rendering that part of the hide quite useless for the purposes of leather manufacture. Dr. Lingard, the Imperial Bacteriologist, is of opinion that measures might be taken to minimize the loss occasioned by this pest. He desires, however, in the first instance, to be furnished with certain additional information regarding the life history of the insect, which might be obtained from the local authorities of stations where the pest is known to exist. The question is one which is of importance both to the Army Boot and Ordnance Saddlery Factories. We write to ask therefore that you would be pleased to move the Secretary to the Government of India in the Revenue and Agricultural Department to permit Dr. Lingard to prosecute the enquiry and to give him the necessary facilities for doing so. It is understood, of course, that Dr. Lingard is already fully occupied on other fields of enquiry; but we are assured that the one now suggested would not take up much of his time, and would only necessitate a visit of a few days to the locality, from which the hides are mostly obtained, about the end of the rains. The date to be determined after enquiries have been made from competent persons concerning the usual advent of the "warble" fly.

From notes already privately submitted to us by Dr. Lingard, concerning certain means for combating the effect of the above mentioned insect, we consider that the proposed treatment would lead to satisfactory results.

Should there be any doubt regarding the desirability of furthering this enquiry or its importance to the Army leather industry, we would suggest a reference being made to General Wace, R.A., the Director-General of Ordnance in India.

DIARY NO. 2790.

No. 3807-D., dated Simla, the 13th August 1898.

Memo. from—CAPTAIN I. PHILIPPS, Officiating Assistant Secretary to the Government of India, Military Department.

To—The Secretary to the Government of India, Revenue and Agricultural Department.

Forwarded* for necessary action.

* Copy of a letter from Messrs. Cooper, Allen & Co., dated the 4th July 1898.

G. C. Press, Simla—No. 852 R. & A. D.—14-11-98—350.

DIARY No. 3365.

File No. 131 of 1893.

Serial No. 2.

No. 286—227-R. and A., dated 5th October 1898.

From—VETERINARY CAPTAIN W. D. GUNN, In charge Office of the Inspector-General, Civil Veterinary Department,

To—The Secretary to the Government of India, Department of Revenue and Agriculture.

Referring to previous correspondence in which it was suggested that Dr. Lingard might be asked to supply certain information which might prove of value in order to protect cattle from the "warble fly," I have the honor to forward Dr. Lingard's reply.*

* No. 234, dated 1st October 1898.

2. Under the head of "treatment" it will be seen that he gives no system of treatment for the prevention of the attack by this pest which is at all likely to be adopted by cattle-owners in this country. His suggestions have been extracted from "Neumann's parasites and parasitic diseases," and are only applicable to European countries.

3. Unless a useful remedy is at hand and extremely cheap, no native cattle-owner will trouble to protect his cattle. No better remedy can be used than the applications of common crude oil to the backs of cattle, and this commodity is used in every hut in India. *Neem* oil would also prove an excellent preventive.

No. 234, dated 1st October 1898.

From—The Imperial Bacteriologist, Muktesar,

To—The Inspector-General, Civil Veterinary Department.

Referring to your letter No. 1360—227-M., dated 29th August 1898, in which I am desired by the Government of India to furnish your office with a copy of the "short account of the life history of the 'Hypoderma of the Ox,' together with a resumé of the means recommended for its prevention in Europe," secondly, to specify the "Medicaments" or the special method of using them, I have the honour to enclose the accompanying short account of the above specifying the "Medicaments".

"The Ox Hypoderma (*H. bovis* Degeer) is by far the most interesting of the cuticole species, for it is abundant in this country, and extends from Scandinavia and North America to the south of Europe, and to Asia and Africa. It has the following characters:—

> Black, very hairy. Face gray, with white or yellow hairs, similar hairs on anterior half of the upper surface of the thorax, black on the posterior half, and marked by wide longitudinal bands of shining black, close together. Abdomen black, covered with white or yellow hairs at its base, black in the middle, reddish-orange in its posterior third. Legs black at the base, yellow in their terminal moiety; wings somewhat brown. Length, exclusive of the ovipositor, 13 mm. to 15 mm.

In its perfect state this insect lives during the months of July and August, and may even be met within the first days of September. It is particularly well known from the fact that it can be artificially hatched when the larva is extracted from the ox's skin and kept in favorable conditions. The female is provided with a soft, short, black, cylindrical oviscapt, which is folded beneath when the insect is resting, and which serves to deposit its eggs on the skin of bovines while they are out of doors. It prefers the upper parts of the body—the shoulders, back, loins, croup, sides and flanks. Its flight is rapid and accompanied by a buzzing sound. When it is about to lay its eggs, it flutters above the back of the ox for a minute or two, then suddenlly drops, deposits an egg on the skin, rises in the air, again flutters, descends with the like rapidity as before, and drops another egg. This manœuvre is repeated ten or twelve times in a quarter or half hour.

98

It is a widespread belief—which the majority of authorities have subscribed to—that the approach of the female Hypoderma causes great terror among cattle: they are restless, become more and more agitated, and finally start off in a frantic manner, with tail horizontal, until beyond the sound of their enemy. Sometimes they plunge into water to shelter themselves from the dreaded pursuit; and in this way accidents may occur. This fear is contagious, and one Hypoderma will put to flight a whole herd; it is even sufficient, it is said, to closely imitate the buzzing of the insect to realise the same moral effect, and to this trick is often attributed the panics among cattle which occur at Fairs.

Virgil is considered the first writer who has described the fear that the Aestrus inspires in herds ("Georgicorum," lib. III); but it is more than doubtful that the insect which he mentions belonged to the family of Aestridæ; and, on the other hand, doubt has been thrown upon the correctness of the popular belief which, from the time of Virgil, has been transmitted to our own day. It is really founded on the dread the ox may experience of the puncture the female Aestrus makes on implanting each egg in the skin. But it is well established that the oviscapt (ovipositor) of the Aestrus is not adapted in any way for boring, and is merely a depositing apparatus: consequently, egg-laying does not cause any pain to the host. Bracy Clark first, and Hertwig afterwards, remarked on this fact; and, besides Goudot, who has personally experienced the effects of the larvæ of the Dermatobia, asserts that he never heard or saw the flies, much less felt them deposit their eggs on the uncovered parts of his body, and is inclined to attribute the fear of animals on the approach of the Dermatobia, to an instinctive prevision of the future trouble that awaits them. On the other hand, it may be asked if the share the Hypoderma have in causing fear among cattle is well founded, or if it is not rather due to their not being able to discriminate between the buzzing made by the insect and that of the gadflies, breeze-flies, wasps, and other Diptera which torment animals under the same circumstances—that is, in hot and stormy weather. Although Brauer, who is responsible for the statement, says that two females of the *Hypoderma Aetæon* have been seen depositing their eggs on the backs of deer without these appearing to notice them, yet he is careful not to draw an inference from one species to another. On the contrary, he brings forward a document to prove that here, also, popular observations cannot be relied upon without an imposing array of facts to support it. It is a letter from Schleicher, an intelligent farmer of Gresten, Austria, who had seen the perturbation caused by the Hypoderma, and was able to capture the insect in the act of laying, forwarding it to Brauer, who recognised it as the female of the *Hypoderma bovis*, with an egg still between the pincers of its oviscapt.

It is probable that the ova are deposited on the skin itself, or at the hair-roots; but no one has seen them there. Those who have described the eggs have obtained them directly from the female by slight pressure on the abdomen.

These eggs are white, elongated, spindle-shaped and a little flattened; they have a posterior pole, with a brownish appendage, which appears to be used to make the eggs adhere to the hairs; they are 1·25 mm. long. The duration of incubation is not known, neither is the form of the larva in the *first* stage. However, C. Curtice considers—and in this he is supported by C. V. Riley—as belonging to this first stage of the *Hypoderma bovis*, larvæ of from 10 mm. to 15 mm. long and 1·5 mm. broad, similar to those of *Hypoderma Diana* figured by Brauer, and which he found in the wall of the œsophagus, beneath the costal pleura, and in subcutaneous tumours on the back of oxen in the United States.

In the *second* stage—which usually corresponds to the month of May and lasts about thirty days—the larva is club-shaped, and measures 13 mm. long and 4 mm. broad at the fourth segment. The lateral prominences are very salient; the microscopical spines of the integument are in small groups on the sides of the two first segments, at the anterior border and upper surface of

the second and third segments, at the two borders and inferior surface of the second and ninth, and over the entire surface of the last.

At the *third* stage the larva is thick and pyriform, and the lateral prominences are still more salient. On the upper surface is remarked, at the anterior borders of the second to the fifth segments, small spines more numerous anteriorly than posteriorly; the same is seen at the posterior borders of the second to the seventh or eighth; and the same also at the superior and middle prominences of the second to the fifth segments. On the inferior surface the spines running along the two borders of the second to the ninth segments are larger on the anterior than the posterior border; and it is the same on the anterior border of the inferior lateral prominences from the second to the eighth segment. The two last segments are completely unarmed. The skin is rugged and furrowed, and is at first white, except where the spines and stigmatic plates are; there it is of a dark brown. As age advances, the larva assumes a grayish-yellow tint, then it becomes speckled with brown, and finally becomes yellowish-brown when mature, which occurs in June or July, exceptionally in August. It then measures 22 mm. to 28 mm. long and 11 mm. to 15 mm. broad at the eighth segment.

Larval existence is passed beneath the skin of the host, in the subcutaneous connective-tissue, in the panniculus carnosus muscle, or underneath aponeuroses. In the earlier period no irritation is remarked around the parasites; but when the spring arrives the presence of the larvæ is made manifest externally by tumours, the size of which increases with the development of these creatures. The number of the tumours is variable; there are rarely fewer than four or five, and usually there are ten to twenty, sometimes as many as fifty, and even one hundred and twenty have been counted. They are of unequal volume, but seldom exceed the size of a nut; they have the characters of a cold abscess, and are not abnormal in temperature, nor markedly painful. At their summit, or towards their base, they are pierced by an opening which is at first little apparent, but which measures from 4 mm. to 7 mm. in diameter in those tumours from which the larva is about to escape. From this opening flows pus, which dries and agglutinates the adjacent hairs; this comes from a subcutaneous abscess in which the larva is lodged. It is in the second stage of larval life that the tumour appears, and it is due to the presence of the parasite, which acts as a foreign body, irritating the tissues by the spines with which it is covered, and producing a moderate degree of inflammation that results in the formation of embryonic tissue in concentric layers, which are of a fibrous consistency in those that are deepest, and softer towards the surface. The skin is infiltrated and speckled with ecchymoses and blood-stains. The opening results from a process of ulceration; there is no hole at first, although Stricker has admitted that the larva penetrates by the orifice of a hair follicle or sebaceous gland, and that the tumour of the Aestrus commences in one or other of these elementary organs. The larva almost exactly fills the sac, the shape of which is reproduced externally; and the creature is so placed in it as to present to the opening its oval-anal extremity, furnished with the stigmated plates, while the cephalic end is turned towards the bottom of the sac. It is nourished not only by the pus which it has caused the production of, but also by the blood of its host, as an abundance of that fluid is found in its digestive apparatus.

When the development of the tumour is somewhat advanced, methodical pressure at its base will readily cause the expulsion of the larva. A few days before leaving its abode, the creature enlarges the opening in the tumour by pushing at intervals the last segments of its body into it, until, finally, it emerges in a state of complete maturity—usually in the morning between six and seven o'clock, as Reaumur had long ago remarked. Those larvæ which do not perish by being trodden upon by their host or devoured by birds, creep along by means of the hooklets on their inferior surface and the energetic contractions of their bodies, until they find a convenient place for their transformation into nymphæ; they then penetrate the ground to a depth of two or three inches, or conceal themselves in hay, among leaves, etc. The nympha is about three-fourths of an inch long externally; in shape it is pyriform and

expanded, its anterior extremity showing a plane, oblique surface turned upwards, and infringing on the superior surface. The condition of nympha lasts for twenty-five to thirty days.

After the larvæ has left its cyst, the formation of pus gradually ceases and the wound cicatrizes; though for a long time it bears traces of the alteration it has undergone, so that the skin is seriously depreciated in value, especially if the larvæ have been numerous. And this is not the only damage the parasite inflicts, for it evidently acts as an exutory, and in this way brings about the loss of nutritive material to the prejudice of the milk secretion and fattening. But it rarely happens that the animals themselves suffer in health, though it is doubtful if these larvæ exercise a salutary effect on the economy—preventing disease by acting as derivatives, according to Bracy Clark's belief. Lafore asserts that country people consider the presence of the larvæ as a proof that their animals are of good quality and that they fatten well; and they explain this belief by the instinct that impels the Hypoderma to deposit its eggs on animals with a fine supple skin. However this may be, it is certain that if aged animals are spared its visitations, calves are equally exempt.

(The pecuniary loss occasioned in this country by the "warble fly," as the *Hypoderma bovis* is popularly designated in England, has been represented as very great, being estimated at as much as one pound per head on every animal unsheltered from its attacks, which would probably amount to seven or eight millions of pounds a year for the United Kingdom. Among dairy cattle the loss has even been put so high as three pounds per head.

The loss by damage to the hides is also extremely heavy and has been given as averaging one penny per pound weight, or five shillings and ten pence for each hide. One extensive hide-importing firm reports:—"Parcels of ox and cow hides and goat and sheep skins, coming from all parts of the world, all contain a varying proportion of warbled hides and skins, the damage being greatest, as a rule, on those from the hottest climates, and generally affecting goat skins to the greatest extent. Those hides and skins from Mogador, and other northern parts of Africa, suffer most in this respect, an average of about one-fourth of them being damaged to the extent of 60 or 70 per cent. of their value. Those from Karrachee, India, also suffer damage to almost the same extent; while those from Calcutta, Madras, and Bombay are depreciated perhaps to the extent of 50 per cent. on 10 per cent. of the skins. From the Cape Colony the skins are comparatively slightly damaged, and still less are the hides and skins from Australia and South America.")

Treatment.—To preserve animals from the ravages of Hypoderma, it is only necessary to employ one of the many measures indicated when dealing with flies. Brauer relates that, in certain localities where the Aestridæ abound, the inhabitants have succeeded in diminishing the number of these, by not allowing their cattle to pasture after 10 o'clock in the morning from April to August. As the mature larvæ usually quit there host before that hour, they fall on the cow-shed floor, and not finding a suitable quarter in which to pass their nymphosis, they die; consequently, the species is much diminished. It has been remarked that such cattle are very much less visited by the Hypoderma than those of the Alps, in which the larvæ are exceedingly numerous, because the animals live out of doors night and day.

In order to free the skin from the larvæ which have invaded it, they may be extruded by pressure of the fingers, or they may be killed *en place* by introducing a lancet, or a bistoury, or a red-hot stylet into the orifice of the tumour. The same result can be obtained by the use of benzine, oil of turpentine, tar, or salt water. But these have the disadvantages of causing a long suppuration, in order to bring about the gradual elimination of the dead body of the parasite. It is, therefore, preferable in every respect to remove it at once, if necessary, by its exit orifice, in enlarging this and seizing the creature with forceps. Nothing more is then required than attention to keeping the wound clean and healthy.

(In England, much attention has been paid to this subject of prevention and treatment, and many suggestions have been made and carried into practice.

One experienced Veterinary writer, H. Thompson, says: "Respecting the application of anything to prevent the warble fly depositing the eggs, there are a number of matters of a tarry nature that might be applied, but nothing better than Stockholm or green tar. This should be rubbed along the back of the cows before turning them out, and the dressing would last all the summer season, or applied in May and June between the top of the shoulder-blade and loins. This is the only part the cow cannot lick, rub, or lash with the tail; hence the only peaceable place where the fly can leave its eggs. On sheep salve bad butter and tar mixed with sulphur. About two applications would last a full season. Or the application of brine is useful. It is a common practice to wash the cows' backs with pickling brine, the application being made two or three times during the season. In this part—Cumberland—larger farmers keep what is called the "pickling tub," wherein they put beef and mutton. The brine is made with salt and water, salt being added until an egg will float in it. This is an old remedy, and I think a good one as I believe the ova would be destroyed immediately the mixture was placed on the skin. I have used, and also recommended, the following mixture as a preventive: flour of sulphur, four ounces, spirits of tar, one gill, train or whale-oil, one quart. Mix well together, and apply it to all the spine of the cow once a week with a small brush. The smell drives off the flies, and prevents them depositing their eggs, the cattle are left at peace to graze, and warbles thus prevented. Paraffin, kerosine, carbolic acid, phenyle, etc., are all too transient to be of much service, and would have to be frequently applied.")

Neumann's Parasites and Parasitic Diseases, 1892, page 48, *et seq.*

G. C. Press, Simla.—No. 853 R. & A. D.—15-11-93.—370.

1898.

File No. 131 of 1898.

Serial No. 3.

GOVERNMENT OF INDIA.

DEPARTMENT OF REVENUE AND AGRICULTURE.

CIVIL VETERINARY ADMINISTRATION.

To

THE INSPECTOR-GENERAL, CIVIL VETERINARY DEPARTMENT.

No. 2370—131-3.

Dated Simla, the 12th November 1898.

SUBJECT.

Ravages caused to hides by the cattle-pest known as "Warbles."

G. C. Press Simla.—No. 854 R. & A. D.—14-11-98—381.

1898
Rev. No. 2
No. 8024

No. 2370—131-3.

FROM

E. MACONOCHIE, ESQ., I.C.S.,
Under-Secretary to the Government of India,

TO

THE INSPECTOR-GENERAL, CIVIL VETERINARY DEPARTMENT.

Dept. of Rev. & Agri.
Civil Veterinary Administration.

Simla, the 12th November 1898.

SIR,

ADVERTING to your letter No. 286—227, dated the 5th instant, I am directed to forward, for information, a copy of a letter, dated the 4th July last, from Messrs. Cooper, Allen & Co. of Cawnpore, to the Military Department, relating to the ravages caused to hides by the cattle-pest known as "Warbles."

2. The Government of India consider that it is not at present necessary for the Imperial Bacteriologist to undertake an inquiry into the matter, as suggested by Messrs. Cooper, Allen & Co. They are, however, of opinion that Directors of Land Records and Agriculture, and Superintendents of Civil Veterinary Departments, should be furnished with Dr. Lingard's note on the life history of the "Hypoderma of the Ox" and the medicaments and treatment in use in Europe, together with the information contained in paragraph 3 of your letter under reply, and should be asked to make inquiries during their tours as to the local prevalence of the disease and the customary methods of treatment. The subject can then be further considered, if necessary, and the available information published for general use as a number of the Veterinary Series of the Agricultural Ledger.

I have the honour to be,
SIR,
Your most obedient Servant,
E. MACONOCHIE,
Under-Secretary to the Government of India.

When given for copying ——
When copied ——
When examined ——
When signed ——
} 189 .

READ AGAIN G.O., No. DATED
189 ,

CURRENT No.

ENCLOSURES TO C. No.

ORDER OF GOVERNMENT	A	A	A	A	A	A	A
LETTER OF GOVERNMENT.							
STATEMENT WITH DITTO.							
PAPERS NOT FILED UP, BEING MEANT FOR DESPATCH IN ORIGINAL.							

N.B.—
A = Copy in full.
B = Not to be copied.
P = Copy abstract only.
Q = Copy heading only.

1898
.....3
.....1024