



NO. 20.

SUPPLEMENT

TO THE

NEW SOUTH WALES

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THURSDAY, 13 MARCH, 1851.

*Colonial Secretary's Office,
Sydney, March 13th, 1851.*

EPIDEMIC IN STOCK.

REFERRING to the Notice dated 11th ultimo, containing a preliminary Report from the Commission recently appointed to enquire into the nature of the prevailing Epidemic in Stock, with respect to diseased Meat, His Excellency the Governor is pleased to direct the publication of the following further Report.

2.—His Excellency has also directed the publication of the annexed Paper on the subject, prepared by the Revd. James Walker, M.A., of Liverpool.

By His Excellency's Command,

E. DEAS THOMSON,

SIR,

WE, the undersigned, members of the Commission appointed by His Excellency the Governor to enquire into the prevailing epidemic amongst stock, beg to state, for the information of His Excellency, that since our last communication, dated February 7, we have continued making observations ourselves and enquiring into the opinions of others acquainted with the subject. And we have now the honor of laying before you, as Appendices to this portion of our Report, first, an account of an analagous disease in France, translated from M. Hurtzel D'Arboval, and secondly, twelve *post mortem* examinations, two of which have been furnished by Mr. Meston, and two by Mr. Robertson, of Parramatta.

These examinations fully confirm the opinion we advanced before—that the disease is one of a highly inflammatory character. And they so clearly point out the seat of the disease that we have no hesitation in calling it an inflammation of the spleen and intestinal canal, or, in pathological language, a spleno-enteritis. We are also fully warranted, by the evidence we have collected, in stating that it is an epidemic, or more correctly an epizootic disease, and that its attacks have been principally confined to the Sydney side of the mountain ranges, to the country between the Blue Mountains and the Sea, between the Bulga Mountains on the north, and the Illawarra range and Razorback on the south.

We regret that a knowledge of the cause of death does not enable us to prescribe rules of prevention, that is, rules of any practical utility, for sheep and cattle must be sent to Sydney, and must therefore be exposed to the miasm of the epidemic. This miasm is too subtle to be detected by the most refined analysis; no one has yet been able to say what peculiar change of the air causes the epidemic influenza which has twice, of late years, over-run Europe, or the pleuro-pneumonia which has been so fatal to cattle in England. And as cattle and sheep driven from their runs towards Sydney are exposed to all the causes which would excite individual and isolated cases of inflammation, so are they rendered more prone to be attacked by the epidemic. Very hot and very dry summers, sudden changes of temperature, want of water or bad water, want of pasturage or bad pasturage, long journeys and neglect of proper times for rumination, are all causes likely to produce a susceptibility to disease, and especially the combination of two or three of these causes. Thus the predisposition of the animal meets the predisposition of the air, and the frequent deaths we hear of result.

It is not necessary that the disease should be contagious to account for the many deaths in one herd, and we have not yet sufficient proof that it is so, but we cannot say positively that it is not so, and are now engaged in some experiments to decide the question, if we can, satisfactorily.

As means of prevention we can only advise the avoidance of such as are avoidable amongst the exciting causes we have mentioned;—but as the disease may be contagious, we must strongly advise the immediate compulsory burning of all animals dying of it wherever they may be.

As to cure, though at an early stage bleeding largely might be useful, yet the trouble and expense of any treatment we could suggest would scarcely be repaid by the value of the animal.

The history of the disease shortly is, that it was first noticed in some paddocks between Liverpool and Camden in 1847, and that since, with one short interval, it has never ceased to attack cattle at all times of the year, more however in hot weather. At first it was entirely confined to cattle, but for some time past, above a year, it has also attacked sheep. There have been many deaths amongst horses, but we have had no opportunity of examining one,* nor have we met with any record of a *post mortem* examination of a horse shewing the distinctive marks of the disease.

The external symptoms are not very strongly marked, and the wildness of the cattle here renders observation difficult. Those, however, who are conversant with the habits and look of animals, can frequently say when they are affected, though not many hours before death. The animal is dull and heavy-eyed, almost as if blind, occasionally violent as if from pain; a very short time before death blood and slime flow from the nostrils and anus. Death is described as generally easy.

* Since this Report was written, we have had a strongly marked case, which will appear in our next Report.

The internal appearances on dissection are very interesting to pathologists, presenting constant signs of inflammation of the spleen or melt, and of the intestinal canal, and not unfrequently of other parts, with great engorgement of the whole venous system, and a peculiar change in the appearance of the blood. For the details we refer to the cases subjoined. Much alarm has been caused by the deaths of several persons who have been employed in skinning animals which have died of this disease; nor is this alarm unfounded, for it is certain that several deaths have occurred. Hence a belief has arisen that there is something peculiarly virulent and poisonous in the flesh of these animals, and it is sometimes said that wild dogs and eagle hawks will not touch it. From the evidence before us we think this is not the case; and we know, from undeniable sources, that tame dogs are fed constantly with such flesh, and that the most diseased portions of the melt have been given to pigs without injurious result.

But it must be borne in mind, that not in this disease only, but in almost all diseases, it is a service of danger to handle the bodies of affected animals; and that when there is any scratch, chap, or sore on the hands of the examiner, or on any other part of the body brought into contact with the dead matter, inoculation takes place and ill consequences almost invariably ensue, varying in intensity according to the state of the recipient's health and constitution. And when we consider how many animals have died of this disease, and how many unskilful persons have been employed about them in consequence—men frequently of irregular lives and bad habit of body—we cannot be surprised that deaths have occurred. But we know, at the same time, that many persons have recovered by proper means promptly used, even after they have been fully inoculated, and we hope that the alarm will subside into a salutary caution.

It may be worth while to mention that a free and early use of caustic may obviate ill consequences from a cut or scratch in such employment; but wherever medical aid is attainable it should at once be resorted to.

We are still engaged in taking evidence and making experiments on certain points connected with this disease, and we shall not consider our duties terminated until we are able to present you with the results of our experiments and with the evidence in a classified form. We regret much that our information does not enable us to state that the disease is on the decrease, as we still hear of many casualties among the flocks and herds on their way hither.

We have the honor to remain,

Sir,

Your very obedient servants,

W. HALL PALMER.

R. GREENUP.

CHARLES NATHAN

JOHN STEWART.

JNO. INCHES.

JOHN PETER.

B. O'BRIEN.

Sydney, Feb. 25, 1851.

APPENDIX A.

THE following account is freely translated from Hurtzel d'Arboval. The names given to the disease are very significant and expressive of that high state of inflammation which we have always found implicating the spleen and intestines. It is some consolation to find that this colony is not suffering from an unknown disease, but from one which, though very fatal, has still some limit to its destructive powers.

Maladie du Sang; Sang du rate; la Chaleur; le Sang; Mourroy rouge; Splenorrhagie; Apoplexie charbonneuse de la Rate. This is a disease of sheep, which also attacks cattle, and is remarkable for the rapidity with which it runs its course, and for its generally fatal termination. It

consists in a sudden accumulation of blood in the vessels, in a plethora, which shews itself suddenly in the flock; generally speaking, there is nothing beforehand to lead to the belief that an animal is going to sicken; and the very individuals which are so soon to die seem to enjoy perfect health a few minutes before the attack. Everything which shews good health is observable in these animals—as strength, good condition, and good appetite; they are the first to spring out of the fold; their wool is in a healthy state; so are the skin and mucous membrane, as far as it can be seen—when suddenly they droop and die in two or three hours. The disease attacks always the strongest, fattest, and best looking animals. One which, up to a given moment, had shewn no sign of ailment, stops suddenly and totters; its breathing becomes laborious; it foams at the mouth, which it keeps open, and rattles in the throat; blood escapes from the nostrils, the anus, the vagina; it struggles and presently dies; the body putrefies very quickly afterwards. Such are usually the appearances, though they differ somewhat in different subjects. In some there is rapid and considerable swelling after death, which sometimes commences before. Some pass solid excrements, mixed with blood and bloody urine.

On opening the bodies the subcutaneous vessels are found gorged with blood; the internal surface of the skin, when examined after being taken off, is red and perfectly injected; the tissues are also redder than usual. The spleen is constantly gorged with blood. The mucous membrane of the 4th stomach is much inflamed, especially where it joins the duodenum, and comes off in shreds when the thick mucous matter covering it is scraped off; so that the longitudinal folds, some of which are ecchymosed in many places, disappear. This stomach contains a brownish red liquid which is extremely fetid. The paunch presents nearly the same alterations, but with less intensity, the cuticular covering of its mucous membrane being adherent to the food therein, and coming off with it on any attempt to remove it. The bladder, half filled with limpid dark red urine, shews exteriorly a very red color; the ureters, though shrunk in diameter, are little inflamed; the substance of the kidneys is inflamed, without firmness, yielding to the least effort to tear it; the renal vessels are engorged and distended; the canal of the urethra a little inflamed at its junction with the bladder.

M. Herpin adds other particulars somewhat differing from the preceding:—

In some cases he remarked infiltrations of black blood—large black bladder-like patches of ecchymosis in front of the shoulders and the thighs. The paunch, swelled out by gas, contains generally much food; the stomachs are in the natural state, but the upper part of the small intestine is always inflamed; the anal extremity of the rectum also shews marks of intense inflammation. The liver is healthy, a remarkable fact in so general and intense an affection of the abdominal organs. The spleen is enlarged to two or three times the natural size—full of thick black semifluid blood; its substance tearing with the smallest effort and breaking down into a pulp between the fingers.

We omit the causes as only applicable to the more artificial life of animals in a highly cultivated country. The disease is described as very destructive, some farmers losing one-fourth of their flocks; more are attacked during the great heats of summer; the hottest days are the most fatal, and especially when storms occur; the mortality is less in cold weather and after rains. But over and above the atmospheric influence and the individual constitution, there is something else necessary to develop the disease, as the sort of food the animals have during the year, especially when the disease is rife, or a hurried journey on a very hot day, &c.

But we feel obliged to add the hypothesis of M. Herpin as this, though somewhat scouted by M. Hurtzel d'Arboval, finds strong confirmation in our cases of inoculation and in the pustule described by Mr. Robertson as occurring from inoculation by this disease.

“ Another opinion has been proposed by M. Herpin, that this '*maladie du sang*' is of a pernicious and malignant nature, or, in other words, that it belongs to the class of carbuncular affections. This physician relies principally on the epizootic character of the disease, and on the sudden and constantly fatal manner in which it attacks animals in the full vigour of health and strength: on the state of decomposition and mortification of the spleen: on the appearance of the blood, which is, as it were, putrified; and lastly, on the property it has, according to him, of producing malignant pustule on man. He relates the case of a shepherd who had the charge of a diseased flock, and on one of whose hands there appeared a carbuncular tumour, which he was obliged to treat as malignant pustule. But there is nothing to prove that this pustule arose in consequence of anything connected with the sheep; nor have the other reasons brought forward by M. Herpin any positive value, though he has thought them sufficient to give the disease of the blood the new name of carbuncular apoplexy of the spleen. Since it is not proved, nor is it even probable, that this disease is communicable from one animal to another, or, in other words, contagious amongst sheep; and since it is certain that it does not always attack all the individuals of the same flock, and as, even if it did, the extension of its attack might be explained by the continuance or extension of external causes, it would be more than rash to look on it as transmissible from animals to man, on the authority of only one case, and that doubtful.

While we would deprecate equally with M. Hurtzel d'Arboval, the idea of forming a hypothesis from only one fact, yet if we had known nothing more of the matter, we should have considered his reasoning weak, as there never was any disease so contagious as to attack indiscriminately all exposed to its in-

fluence. But as we know from our own cases of inoculation, that the disease is transmissible from animal to animal in one manner at least, and as the effects of inoculation on man seem to be accompanied by malignant pustule as shewn by Murphy's case (see No. 1 reported by Mr. Robertson), we can have no doubt that M. Herpin's opinion is worthy of more consideration than it has received.

No. 1, Murphy's case, from Mr. Robertson's M.S.

Patrick Murphy, aged sixty-four years, in the service of George Oakes, Esq., M.C., as shepherd, was brought to hospital in a gig on January 26th, 1851, at noon. He complained of being very ill, and was almost incapable of remaining in the erect position, from giddiness and weakness of the inferior extremities. He stated that he had a black mark or blister on his arm, and that the extremity was considerably swollen, also the corresponding side, but disappeared two days previous to coming to hospital. He denied having skinned any cattle, but had done so to two sheep which died out of the flock he was in charge of. I examined the arm, and found a vesicle, about the size of a shilling, full of disorganized lymph and dark grumous blood, puckered at the edges, and depressed in the centre, presenting the same appearance as those cases which I had witnessed from skinning bullocks, with the exception that there was no swelling nor inflammation of the absorbents. Tongue white, furred, and moist; pulse weak and irregular; violent constipation, considerable depression of the vital powers, great irritability of the stomach, incessant vomiting, gait tottering, pain in the left side in the region of the spleen, constant and increased on pressure; abdomen hard and tense with a constant pain increased on pressure, which extended over its entire cavity; appetite depraved, and what little nourishment he partook of was immediately ejected from the stomach. On Monday, the 27th, he had no perceptible pulse, vessels of the face and integument all over the body congested. He died at three o'clock in the afternoon of this date.

Post Mortem appearances.—The vesicle on the arm had the same appearance as described previous to death, and contained disorganized lymph of a dark livid color; on cutting into it, the sensation communicated to the edge of the scalpel was that of penetrating through cartilage; the cellular tissue, fascia, and muscles in the situation of the vesicle were also disorganized and of a cartilaginous hardness. On opening the thorax I found a large quantity of gelatinous lymph under the sternum and extending over the pericardium; the pleura pulmonalis were adhering firmly to the costalis, the result of former inflammatory action. The lungs were congested, and in several situations covered with tubercles about the size of a pea, also the result of previous inflammation. The heart natural in size, with slight ossific deposits on the valves, not sufficient to interfere with their functions. On opening the abdomen, I found the liver considerably darker than natural, and in a few places gangrenous; also, the calibre of the hepatic vessels filled with lymph; the stomach natural; the spleen its natural size, gangrenous and falling to pieces on the slightest touch; all the coats of the large intestines gangrenous; the small healthy; the kidneys healthy. It is my opinion, that taking into account the comparatively healthy state of the deceased previous to skinning the sheep, the ossification of the valves of the heart and the tubercles of the lungs were not sufficient to account for the constitutional disturbance, nor his rapid dissolution; but the appearance of the arm, spleen, intestines, and liver, accompanied with the symptoms present during life, and from what I have seen in about twenty cases of a similar nature which have come under my notice, convince me that his death was caused by a most virulent morbid poison, the action of which on the human body will be modified according to the constitution or habits of the individual on whom the virus acts. By what means it affects the spleen more than any other vital organ, I am at present unable to explain, but such is the fact, both in the human body and in cattle. This is the first instance which has come to my knowledge of the disease being communicated from sheep. It therefore becomes a matter of the greatest public interest to investigate the cause and nature of this disease. It has not the slightest resemblance to black leg, and I am sorry to state that scientific individuals are more frequently satisfied with giving a name to a disease than investigating its nature. My reasons for believing that Murphy's death was caused from skinning a sheep that had been labouring under the present prevailing disease amongst cattle, are—1st, from experience I am satisfied that the disease is communicable by inoculation. 2nd, when once inherent in the system, specific vital organs are attacked to the exclusion of others. 3rd, these organs in the different stages of the disease are similar in all animals attacked with it. 4th, the appearance of the part coming in contact with the virus always puts on one uniform character. In the experiment on the kitten (see No. 2,) several of the constitutional symptoms were alike in both, such as the tottering gait, the appearance of the vesicle, giddiness and soporiferous state; the *post mortem* appearances in both also in a great measure simulated each other; the spleens of both were gangrenous, also their large intestines; the liver of each was likewise gangrenous in several places; the above pathological appearances are always found in cattle dying of the disease in an advanced stage.

I have had cases under my charge where the vesicle was much smaller than the one on Murphy's arm, attended with considerable swelling, and inflammation of the absorbents; and the constitutional symptoms so severe as to leave impressions in the minds of my patients that they would die; and it was only by vigorous antiphlogistic treatment that I restored them to health; when the vesicle has been once seen by a medical gentleman, he will as readily recognise it afterwards as he does the vaccine pustule which is so familiar to him. It commences first as a very small furunculus very little larger than a pea, having a broad base, elevated and tapering to a point, presenting a dark livid appearance, with a small quantity of dark matter situated at the apex; this matter, after a short period, becomes absorbed, leaving a depression while the cuticle around it is raised by the effusion of dark grumous blood which extends to the circumference of the base, having the appearance of a vesicle the edges of which is puckered; in addition to the grumous blood, which is very small in quantity it contains principally disorganized lymph of a dark brownish color. The size of the vesicle will vary according to the extent of the injury inflicted, but its average size is from that of a sixpence to a shilling. It is my opinion that the blood of animals dying of this disease is deficient of oxygen, and from this circumstance they die as from a narcotic poison.

THOMAS ROBERTSON.

On the 28th January, after the *post mortem* on Murphy, who died in hospital from skinning a sheep, I coated my scalpel with the secretions contained in the vesicle on the arm of Murphy, and introduced the virus under the integument near the right shoulder of a kitten. Four days after the part presented the same appearance as the one found on Murphy's arm, elevated, puckered at the edges, and depressed in the centre, black, firm, and hard to the touch. On the sixth day the extremities swelled, the eyes lost their brilliancy, the head drooped, with the nose almost touching the ground, tongue protruding from the mouth and of a light crimson colour, breathing slightly hurried, gait tottering with an inclination to roll over as if going to sleep. The above symptoms continued without any perceptible change until death, which took place without a struggle on Febry. 5th. This kitten was the healthiest of a litter and continued to suck the mother.

Post mortem.—The body considerably swollen, also the right fore leg. The vesicle contained similar dark brownish lymph found in that of Murphy's arm. The lymphatics were inflamed. On opening the thorax I found the heart and lungs healthy. In the abdomen I found the spleen rather enlarged, black, and gangrenous, but firmer than Murphy's. The stomach healthy with the exception of one spot the size of a pea, situated at the centre of the great curvature which was gangrenous. The right lobe of the liver gangrenous in two places about the size of sixpence, and the hepatic vessels congested. The small intestines healthy, the large in a greater state of gangrene than I have ever witnessed or read of, the whole of their coats giving way to the slightest touch of the finger. Remarks—The constitutional symptoms of this kitten during life with the *post mortem* appearances after death are very satisfactory, and corroborate my statements as to the cause of Murphy's death.

THOMAS ROBERTSON.

APPENDIX B.

First Observation—Friday, January 31, 1851 :—

Was of a heifer four years old, dead not more than two hours before examination, one of a herd of cattle examined by Mr. Inches the previous evening, at which time no apparent symptom of disease had manifested itself neither in the heifer now dead nor in any other animal of the herd.

There was nothing remarkable in the external appearance except that in the immediate neighbourhood of the animal, and dropping from its anus, dung in small and hardened pieces was found, glued together and covered by a bloody mucus, which bloody mucus was also exuding from the gut.

On cutting through the skin, from the breast along the whole length of the belly, a jelly-like substance presented itself, which upon examination proved to be effused serum infiltrated into the cellular membrane beneath the skin, which oozed out when the cellular membrane was cut into.

On removing the skin a considerable oozing of dark colored blood took place from engorged veins in the cellular substance.

On opening the cavity of the abdomen, a large quantity of bloody serum was found. The caul or omentum was nearly destitute of fat—of a pinkish hue from engorgement of the minute vessels in its substance.

When the omentum was raised the small intestines presented in their external aspect a dusky red appearance, and the cellular and adipose tissues surrounding the duodenum were infiltrated with reddish-yellow serum.

On examining the internal structure of the alimentary canal, the stomachs were found distended with food; the oesophagus or gullet and first three stomachs were free from any indication of disease; on opening the fourth stomach, the mucous membrane was found to be highly vascular and studded with small patches of extravasated blood—ulcerations were also observed.

On examining the duodenum, intense vascularity, with considerable extravasation of blood, was found in its lining membrane, which was also covered by a considerable quantity of bloody mucus. Patches of extravasation and ulceration, varying in extent, were observed throughout the whole extent of the alimentary canal.

The liver was found healthy.

The spleen was enormously distended with blood, not only in its texture but also in the vessels on its surface, which were swollen to their smallest twigs. When cut into it seemed one mass of blood, but when pieces of it were washed the cellular membrane was left tolerably entire; its weight was about 11 pounds; the usual weight in a healthy animal of similar size being from 1½ to 2 pounds.

The bladder, kidneys, and uterus were examined, but presented no evidence of diseased action.

The lungs were paler than is common even amongst slaughtered animals; they did not collapse so much as usual when the thorax was opened; otherwise healthy.

The brain and spinal marrow at their junction seemed quite sound.

The muscular tissue seemed sound, as also the cellular, with the exceptions already mentioned, and the further exception of the cellular membrane surrounding the horns of the uterus, where it was infiltrated with serum.

The blood was throughout dark red, almost purple, thick, not coagulating.

The dissection was carefully performed by Mr. Stewart.

REMARKS—This animal did not swell up immediately after death; there was also some peritoneal inflammation in addition to the affection of the spleen and intestines.

It came from Twofold Bay. Several of the lot have died on the road, but none previous to arrival at ———'s paddock, near Liverpool, where there is no grass, and where the cattle were detained some days owing to a dispute between buyer and seller. Another lot of cattle from the same run, by the same road, and in company, though not mixed, were put into another paddock near Liverpool, well grassed, and shewed no sign of disease. Authority for these latter statements, Mr. Raper.

Second Observation—February 1, 1851 :—

A sheep which died last night. It shewed considerable extravasation of blood into the sub-cutaneous cellular tissue over the shoulder, spreading back, but more faintly, over the loins. On opening the abdomen, the animal was found in high condition, the omentum or caul loaded with fat. The stomachs were healthy, but the pylorus was inflamed, and slighter traces of inflammation were found along the whole course of the intestines. The liver was remarkably pale and doughy. The spleen was very much enlarged and engorged, discoloring the contiguous parts. The kidneys were surrounded with a large quantity of fat, and were congested and softened. The bladder was full of bloody urine; its mucous lining was very highly injected, being of an uniform dark red color. Lungs not unhealthy. Heart sound.

REMARKS—In this case the inflammation of the intestines being slighter, while that of the spleen is more intense, would tend to shew that the splenitis is the primary disease; the inflammation of the kidneys and bladder is a complication, shewing the inflammatory diathesis. The examination was made by Mr. Stewart.

Third Observation—February 1, 1851 :—

A sheep in the highest condition; It died during the previous night, in the same flock as the last. It shewed no external extravasation. On opening the abdomen, the first three stomachs were sound, the fourth slightly inflamed, the pylorus and duodenum were slightly inflamed, and specks, and spots, and streaks of blood were found throughout the whole intestines under the lining membrane.

The liver was red and soft.

The spleen was greatly enlarged and engorged, the contiguous parts being discolored.

The kidneys were highly congested; bladder healthy.

In the cavity of the thorax there was much bloody serum, and the costal pleuræ were highly injected.

The lungs were red, and somewhat engorged.

The examination was made by Mr. Stewart.

REMARKS—The same as in the last case, with the additional complication of pleurisy and hepatitis.

Fourth Observation—February 5, 1851 :—

A bullock very poor in condition, not a working bullock; had been dead 10 or 12 hours; was not swollen but looked lank and empty; blood was flowing from the nostrils and anus.

There was extensive extravasation of blood in the cellular membrane, under the skin on the side on which it had been lying.

On opening the abdomen the caul was found of a pink color. The stomachs contained a quantity of apparently healthy food, but nothing unusual was observed till we reached the duodenum, which was injected with black blood. All the intestines were studded internally with black points, as if of black decomposed blood.

The liver was healthy.

The spleen was immensely enlarged, and in all respects as in Observation 1.

The body was not putrid.

Fifth Observation—February 5, 1851 :—

A bullock in very good condition, quite fat, not swollen; had been dead 4 or 5 hours.

Nothing remarkable externally, no blood nor bloody serum flowing from mouth or anus.

On opening the abdomen the omentum was found pink in color, and loaded with fat.

The stomachs contained food and were healthy.

The smaller intestines were somewhat inflamed, but more slightly than in any other case we have seen. The rectum was the most inflamed being marked longitudinally, internally, with long narrow streaks of inflammatory reddening.

The liver was healthy.

The spleen much enlarged.

REMARKS—Here the signs of disease were altogether slighter.

Sixth Observation—February 6, 1851, by Mr. Stewart :—

A bullock. There was blood at the anus.

Extravasation of blood between the skin and muscles on the lower side.

The omentum was fat and healthy.

The villous coat of the fourth stomach was intensely inflamed, being deep purple all over, with one ulcer very visible near the pylorus. The duodenum was inflamed also, the inflammation vanishing by degrees as it receded from the pylorus.

The whole of the rest of the bowels was more healthy than those previously examined.

The liver was sound.

The spleen larger than in previous cases, and if possible blacker.

The kidneys sound.

There was a great quantity of couch grass seeds in one of the stomachs, and the paunch contained principally the stems of the same.

REMARKS—This account of the contents of the stomach induces us to venture a surmise as to the cause of the difference between our observations and others, in which we have full confidence, as to the rapid swelling of animals dead of this disease. The general swelling or meteorization, as we may call it, is owing to the swelling of the paunch, caused by the fermentation of the vegetable matters within the paunch. When an animal in full health is slaughtered or killed suddenly, the digestive power is not at once destroyed, it is still able to keep the chemical affinities in check for a short time. Thus it does not shew immediate meteorization. But when the digestive power is weakened by disease it is unable even during life to keep down the fermentation, and meteorization takes place sometimes, especially in diseases of the bowels, even before death.

Why then do not these animals swell which we are remarking on? Because for fermentation to take place it is necessary that a considerable quantity of saccharine matter, or perhaps gluten should be present, and if the herbage eaten does not contain in some quantity one or other of these matters it will not ferment.

Now the paddocks in which the animals we have examined have been feeding seem to contain nothing at present but the seed stems and seeds of the couch grass, apparently little more than woody fibre.

If the objects of our observations had been feeding on rich and succulent herbage, we believe they would have swollen at once.

Connected with this subject, there is a remarkable case of poisoning, by the stalks of the red poppy, quoted by M. Hurtzel d'Arboval, in his Dictionary—Article Empoisonnement. Eight cows died, and it was remarked that neither the paunch nor the honeycomb swelled either before or after death.

Seventh Observation—February 10, 1851, by Mr. Stewart:—

A ewe that died last night in the yards at Johnson's Bay.

First three stomachs healthy, no signs of grass seeds, no fermentation.

Fourth stomach, inner membrane reddened all over, with black spots increasing in size and number towards the pylorus.

Duodenum intensely inflamed.

Kidneys soft and gorged.

Uterus inflamed.

Bladder full of blood, lining membrane uniformly red.

Spleen large, black, gorged with blood, weighed 13 ounces.

REMARKS—Mr. Stewart afterwards weighed the spleen of a healthy sheep, and found it to weigh 2 ounces and twenty grains.

Eighth Observation—February 10, 1851, by Mr. Stewart:—

A maiden ewe, inoculated with blood from the spleen of a dead diseased bullock, on Thursday last, at 4 o'clock p.m., died between Friday night and Saturday morning, the 8th February, about 36 hours after inoculation. It was inoculated by a seton in the neck.

Body swelled from air let loose under the skin; great congestion and inflammation on the face, and on both sides of the neck in the course of the jugular veins.

The membrane lining the windpipe on the whole of its branches intensely inflamed; lungs inflamed, a few hydatids in the lungs; bloody serum in thorax.

Spleen very dark, tender, weighed $3\frac{1}{2}$ ounces.

Liver very tender, decomposing, with numerous hydatids in its substance.

The fourth stomach contained a little fluid and some white sand; there were patches of inflammation on its inner membrane.

Duodenum inflamed on its inner membrane.

Kidneys very soft, of a dark purple color.

The other intestines were here and there redder than usual, but not presenting the appearance usual in other animals dying of the epidemic.

Bladder empty, injected and spotted.

Veins of the uterus full of blood.

REMARKS—It was unfortunate that this animal was selected for inoculation, as it must have been previously diseased with hydatids, and the local inflammation about the jugulars with the inflammation of the lungs seems to have killed it before the disease with which it was inoculated could gain ground. But there was some inflammation in the stomach, duodenum, and spleen.

In all these sheep the kidneys have been found diseased.

In all the above observations the state of the blood was similar and peculiar, being very dark in color, and in consistence like treacle.

Ninth Observation—Friday, February 7, 1851, by Mr. Meston, and from his M.S.:—

On cutting up the first bullock, the subcutaneous or cellular tissue seemed to have been full of bloody matter, some parts worse or more surcharged than others and the hide itself, of course, was almost wholly tinged red or dark red.

On cutting up the belly the first remarkable appearance is the peritoneum or envelope of the intestines, &c., discolored and symptomatic of great inflammation. The diaphragm comparatively unaffected.

The cavity of the thorax contained a considerable quantity of crassamentum coagulated; heart empty except a small portion of clotted blood in one of the ventricles.

The lungs appeared much swollen, the left lobe much more discolored, and spotted with bluish brown patches. The divisions of the bronchiæ presented a remarkable looking slimy aspect and traces of partial inflammation were visible in their ramifications.

The liver was considerably enlarged and full of blood, easily broken in pieces and of a dark livid color, having the gall-bladder two-thirds full of bile.

But the spleen offered the most extraordinary object of remark, enlarged prodigiously, over-gorged with congested black blood, which issued out abundantly on the slightest incision into its substance with a knife. Although it was not weighed this spleen was considered to be the largest yet examined, and estimated about 18 pounds weight.

The cavity of the abdomen contained a large quantity of extravasated serous blood. Indeed in both these subjects, the second particularly, the blood had separated into two parts, the serum and crassamentum.

The rumen or paunch was not much distended in this instance; it contained a small quantity of water and macerated grass, some of it very rough and full of seeds; but instead of being dry the mass was soft and perhaps filled about one-half the receptacle of this viscus. The inner coat peeled off on the slightest application by friction of a knife.

The reticulum or honeycomb, (second stomach), shewed similar appearances to its larger neighbour.

On examining the manipples, part of its folds contained semifluid matter and other plates adhered rather strongly together, retaining masticated substances partially dry, and some partially hard and rolled into pellets. Its mucous membrane and papillæ had been highly inflamed, as was also the fourth or real stomach, its coat being covered with dark lead colored patches or spots.

The small intestines presented a most remarkable sight, black, gangrenous, and so rotten that they broke with the smallest pull; in fact all the intestinal canal bore strong evidences of high inflammatory action even to the extremity of the rectum; its termination was streaked with blood, and mucous matter tinged with blood oozed from the anus.

In the bladder were about two pints of urine as black as ink; but the kidneys did not seem to have been much affected.

All the contents of the small intestines were semifluid, a circumstance I never anticipated nor met with before in cases of intestinal inflammations of this nature unless indeed dysentery had prevailed, which is not at all evident, as scarcely any evacuations are noticed.

The brain contained little sanguineous matter, and seemed in a more healthy state than any other organ.

Tenth Observation—February 7, 1851, by Mr. Meston, and from his M. S. :—

2nd.—A carcase, which had once been a working bullock in good condition.
 Skin of the belly white, but fearfully bloodshot on the sides and back.
 Cavity of abdomen full of serous blood.
 Peritoneum more inflamed than No. 1, liver not so large, although a much larger carcase, nor the spleen half so bulky.
 The rumen much distended by gaseous evolutions.
 A great quantity of water was found in the paunch, with a plentiful supply of hay and grass.
 In every part the symptoms were similar to the first subject.

REMARKS—These dissections, so creditable to Mr. Meston, were performed by him in the presence of Mr. Inches. We may consider them as entirely independent testimony, for he was not acquainted with our dissections. The inflammation seems to have been very general and intense in both instances.

Eleventh Observation—February 13, 1851, by Mr. Robertson of Parramatta, and from his M. S. :—

1.—A fine fat cow of Mr. Cobben's, which died this morning, nine hours previous to my visit. Before commencing the *post mortem*, I received the following information from Mr. Cobben's son. Last night she gave her usual quantity of milk, which was considerably more than any of his other milch cows, and was apparently in a sound state of health. This morning she evinced symptoms of great pain, her eyes became dim as if totally blind, head drooped, tongue protruded from the mouth, an inability of the extremities to support the body. Mr. Cobben bled her, but she struggled hard and died shortly after the bleeding.

Post Mortem—I found the spleen enlarged to one-third above its natural size, and congested but not gangrenous. The mucous membrane highly inflamed from the third stomach to the rectum, presenting a scarlet appearance, which could neither be washed off nor scraped by the knife. Ulcers were also found penetrating through the mucous membrane in the entire length of the alimentary canal.

Lungs congested.
 Liver congested and in several parts gangrenous.
 Brain natural, the vessels on its membranes congested.
 Kidneys healthy.

Twelfth Observation—By Mr. Robertson, and from his M. S. :—

I now proceeded to examine Mr. Taylor's cow, which died 24 hours previous to my visit.
 External appearances—I found a large quantity of blood on the ground and round the nostrils and mouth which had issued from their cavities during life. The body was enormously swollen, the abdomen distended with gas.
 In this animal I found the spleen twice its natural size and very gangrenous, the large intestines gangrenous, the small healthy.
 The stomachs healthy.
 The lungs congested.
 The heart natural.

The vessels of the brain congested.

The kidneys almost absorbed, and what remained of them approaching to gangrene.

Mr. Cobben does not exactly know how long this cow has been ailing.

REMARKS.—These two dissections are very interesting. The first was a milch cow in full milk, with more inflammation of the intestines and less of the spleen than we have usually found. The inflammation too had advanced to ulceration along the whole tract of the intestine. The second has the small intestines healthy, which we have not hitherto found.

[Paper prepared by the Rev. Mr. Walker, referred to in the foregoing Notice.]

During the months of February and March, 1850, the public mind in Liverpool and its neighbourhood was much agitated by reason of cattle and other farming stock dying in every direction. The mortality being universally attributed to a disease, supposed from a variety of rumours that were afloat, to be highly contagious, and even infectious. Certain residents of that town and district formed themselves into a Committee for the purpose of collecting evidence upon the subject.

The Committee, after going through two or three cases, saw fit to limit their inquiry to the phenomena of the disease and the extent of its ravages, and, therefore, did not arrive at any conclusion as to its cause.

According to the testimony of farm labourers, stockmen, shepherds, veterinary practitioners, and graziers, who were all agreed upon this point, the disease appears to be one of a novel character, resembling, in one respect only, the Milzbrand of Germany, but differing essentially from all other known diseases of cattle, whether in this Colony or elsewhere. It manifests itself pretty uniformly in the following manner.—

Animals, mostly those in good condition, drop down suddenly, while grazing, or returning from water holes, without any previous observable indications of ailment, and die in the course of an hour, or less, without groan or struggle. The body swells almost instantly after death, and the melt is found to be excessively enlarged, and in a disintegrated or rotten state.

The disease first made its appearance at Leppington, the estate of Mrs. Cordeaux, early in the year 1847. On this occasion, the viscera of some of the animals that had died were sent to Dr. Eckford, of Liverpool, for examination, and being eaten by a number of pigs, belonging to the Keeper of the Hospital, caused their immediate death. Nothing was heard of the disease during the year 1848; and it was currently reported and believed, that Mrs. Cordeaux's stock had been maliciously poisoned.

In March, 1849, the disease again broke out actively at Leppington. Two men on the estate, (Crisps,) father and son, died from skinning an heifer. Their sufferings were great for eight or ten days. The legs of the son were swollen to an enormous degree.

About eight or nine months after the death of the Crisps, Mr. Moore, of Raby, contracted for the depasturing of the grass on the Leppington estate, now become plentiful, owing to the loss of the stock. He accordingly put upon it 130 head of cattle, of which two died the first week—three or four the next, when he removed them all back to his own farm; but the disorder has continued in his herd ever since. Up to this period he has lost eighty head.

While the stock was dying at Leppington, that at Raby was perfectly healthy, notwithstanding the two estates are nearly contiguous.

Mr. Moore's herd of cattle had recently come from the Murrumbidgee. The horses, bullocks, and sheep, affected at Leppington, had likewise recently come from the interior.

Early in February, 1850, the disease spread into the township of Liverpool, and along the Cowpasture Road to the southward, as far as Camden.

On the 9th of this month, a man named Turner, of the Cross Roads, died from skinning a bullock. He was attended in his last moments by Mr. Makin, who declined giving evidence before the Committee, as not being a regular Medical Practitioner, but told me in conversation, that the symptoms immediately preceding death, were those of phlegmonous erysipelas.

Speaking generally, the inhabitants of the district are not disposed to be communicative respecting the cattle disease, under an apprehension that their interests may be affected if the existence of it become matter of public notoriety.

All the evidence tends to show, that hitherto the disease has been confined to the line of road, and, with the exception of Leppington, Raby, and the township of Liverpool, to the receiving paddocks. According to the statement of Mr. Moore, Jun., of Raby, the mortality in the Cowpasture district had been principally at Nixon's and at Harrington Park, two regular places of reception for cattle, and could not be estimated at less than five in thirty. It took place on the second day after the arrival of a herd from the interior. On the other hand, at Molesmain, Spring Hill, and Chisholm's estates, in the same immediate neighbourhood, there had not been a single instance of death from the disease. These estates were well stocked, but the tenants never took in travelling cattle.

The disease has not extended westward to Bringelly, nor to the South Creek. The only well authenticated case of its occurrence further down the road towards Sydney is Macculan's, whose herd of fat cattle continued healthy till they came near Petersham, when three died in the paddock of an inn, and six in an adjoining yard. On their way down the country, they had rested in one of the receiving paddocks of the Cowpasture district.

Cattle running in the bush have not been attacked with the disease so generally as those feeding in pastures of cleared ground.

The fattest cattle die the most suddenly. Soon after death, owing to the great swelling of the abdomen, the fore and hind legs that are uppermost become raised quite off the ground, sometimes standing out at an inclination upwards with respect to the body, so that the animal, at first sight, appears to be lying upon its back.

There is no satisfactory evidence of this abdominal swelling taking place in horses, that are supposed to have died of the disease, but it has been observed to ensue in goats as regularly as in cattle, and in one instance, at Liverpool, in less than two hours after the goat had been milked as usual, without betraying the least symptoms of any derangement in its system.

The statements are conflicting as to the effect of the disease upon the secretion of milk in cows, the majority of persons inquired of not remembering to have noticed any diminution in the quantity yielded, even on the very last time of putting the animals in the bail.

The strongest evidence to the contrary is from Thompson, of Liverpool, one of whose cows gave no milk on the evening of her death, and he ascertained that she had first begun to sink it perceptibly the evening preceding.

Milk cows in and about Liverpool have for the most part died in the evening. Mr. Moore, junr., of Raby, states that his milking cows died generally during the night or early in the morning—"from effluvia," as he supposed, "it being their habit to camp in a lane, adjoining a pig paddock, to which all the dead bullocks were removed."

An opinion was more than once expressed, that beasts of the same herd catch the disease from one another, and that localities, where many cattle have died, continue infectious for a long time to fresh ones coming from a distance.

Several persons gave it, as the result of their observation and experience, that the disease only comes on with sudden "changes of temperature, and when the nights begin to be cold and dewy, after great heat during the day," which happens, in some years, as early as the middle of February.

Farming men, generally, seem persuaded that the cattle eat some poisonous plant, being unable to account for the many extraordinary circumstances attending their death on any other supposition.

Facts were adduced, particularly by Pearce, the butcher, and Murphy, the tanner, to prove that the flesh and viscera of the carcases might be handled with impunity—and hence it was presumed, that the serious consequences of such notoriety had only been produced by contact with the blood. The evidence of Mr. Moore, junr., of Raby, that "the flesh, when raw, killed his pigs, but when boiled, did them no harm," may have some bearing upon this point.

These notions are perhaps entitled to some consideration.

As regards the idea of a vegetable poison, there is nothing at present known respecting the disease which there would be any difficulty or inconsistency in referring to this cause—while the dark and venous character of the blood throughout the whole circulation, points strongly to some injury done to the organic nerves supplying the lungs with the influence requisite for the decarbonising process—and it is well-known that the narcotic principle is sufficiently concentrated in some plants to produce such injury on being simply taken into the stomach. No experiments, however, have been made upon the blood, nor do any of the witnesses appear to have examined the melt sufficiently, although most singularly concurring in expressing astonishment regarding it, and all of them speaking of its strange appearance and enormous size in nearly the same terms. The excessive enlargement of a gland, followed by a sudden swelling of the body, would be nothing surprising as the result of a vegetable poison, and on the hypothesis that the regular flow of arterial blood to the system has been interfered with by a narcotic, the failure to the melt of its due supply from the splenic artery would be quite sufficient to cause a suspension of its functions, whatever they may be, and thereby superinduce those morbid changes in its structure which have been so commonly noticed. Also, although the effects of the disease resemble in some particulars those produced by lightning or any violent shock, yet in no instance of death from these causes, or from long exposure to cold and damp, has the flaying of the carcases been known to be followed by any illness or by the communication of any fatal disorder. This, however, happens in Milzbrand, the nature of which disease, according to Dr. Elliotson, is still involved in much obscurity, though its existence is fully established—and it happened about a century ago, with circumstances very similar to those in our district, during the extensive ravages among the cattle in Tornea, which the celebrated Linnaeus satisfactorily proved to have been caused by the eating of the water-hemlock (*Cicuta virosa*).

Further, to give the popular notion of a vegetable poison all the importance that may attach to it, it should be mentioned that it has been publicly set forth as the cause of a mysterious mortality among farming stock in other divisions of the Australian territory. It was reported in the newspapers, about the middle of the year 1850, that sixty head of cattle had died in a neighbouring colony, from eating a leguminous plant, called "Burtonia." "In the Swan River colony, a few years since, hundreds of sheep perished in consequence of their cropping some wild plant; according to an official report, it was a 'Burtonia,'—but according to Mr. Jas. Drummond, the botanist, the mischief was caused by a *Gompholobium*." (*Lond. Journ. Bot.*, 1., 95., quoted by Lindley.) I have never met with a *Burtonia* in the Liverpool District, but two species of *Gompholobium* are very common—*G. grandiflorum* in the bush, whose handsome flowers diffuse around to some distance a most overpowering narcotic odour, and *G. latifolium* in all open ground and along the way-side, the leaves and stems of which are only offensive when bruised. These plants never bear the slightest marks of having been browsed upon.

During the months of October and November, the cleared paddocks throughout the district, especially in the direction of the creeks, are densely covered with "*Anguillaria dioica*," belonging to the section *Veratree* of *Melanthaceae*, than which few orders of plants are more universally poisonous, proving fatal to the lower animals by producing excessive irritation of the mucous coat of the stomach and intestines.

The *Anguillaria*, to the best of my observation, is not eaten by any kind of stock, certainly not while in blossom, and it withers very soon after maturing its seed.

There is another plant of this same section, "*Burchardia*," rather common on sandy soil in the bush, which I have occasionally found cropped when feed has been scanty.

These are by no means the only plants of a poisonous or a suspicious character springing up and spreading annually in the overstocked and impoverished portions of our neighbourhood, but they

are those alone on which I have bestowed any particular attention. It may not be amiss to add, as some test of the value of opinions taken up by the laboring classes in this matter, that one man shewed me a piece of 'Kennedia prostrata,' as the plant which he had observed hungry cattle to eat, and afterwards to sicken; another, a sprig of 'Indigofera Australis,' as disordering the stomachs of cattle and scouring them; a third, an 'Alisma,' as infecting the water, and used by the blacks for poisoning fish.

The contents of the diseased animals' stomachs have not been subjected to any proper examination, neither have any dissections been made of the bodies by persons of competent skill and knowledge. It is on this account that I think it has been rather too hastily concluded, that the cattle disease of this Colony differs essentially from Milzbrand. It is not known under what more favorable circumstances the investigation was conducted in Southern and Western Australia, but there appears no prospect of an equally satisfactory termination to our present inquiry.

As cattle are known to die in ordinary years from overdriving, and occasionally, according to common report, from drinking too plentifully after a long journey of abstinence, or after being crowded together during the night in too confined enclosures, it may be of importance, in future, to examine more particularly into the incidents of the receiving paddocks, and to discriminate, if possible, the cases of almost continuous mortality therein, so as to identify any real malady of the paddocks with the Leppington disease, or otherwise.

One necessary consequence of bringing large herds of cattle in quick succession, from year to year, to the same spot for repose and refreshment, must be the total extinction in such a locality of all those plants which their nature may require, either as stimulants to digestion, or to assist in the chewing of the cud. Cattle under such circumstances must fail of meeting with the stimulating food to which they had been so long and so recently accustomed on their native pastures; at all events, in the Cowpasture paddocks they would scarcely meet with a single blade of those grasses which must have formed the staple of their daily nutriment during the previous part of their existence; they would meet with nothing but couch grass, which they could never have tasted before, and that probably in a rank and soiled state, which none but half starved or hungry cattle will touch; and the privation would necessarily be greater, and less supportable in stock coming from those runs to the southward, where a high condition is so easily sustained by the abundance of salt Bush (*Rhagodia*) and *Polygonum* scrub.

It appears to me, therefore, to be a question worth solving, whether the sudden change of food and the loss of the usual stimulants to animals in good condition, often under circumstances of fatigue from travelling and oppression from heat, be sufficient to produce a malignant disease, or at least, one of the character now prevalent. The experiments of the late Duke of Bedford, reported in the *Horae Woburnensis*, would forbid our disregarding this question or passing it over lightly. For they establish the fact, that a fatal disease may be regularly engendered in sheep by debarring them from all those grasses that contain vegetable extract, which were thus found by these experiments to be essential for keeping up the action of the intestines, though not in themselves nutritious. Under the conviction, that it is possible in some instances, for losses of stock to ensue in the receiving paddocks, owing to the supposed absolute dearth of stimulative food, and the well known difference in the herbage from that over the mountains, I think it would be advisable to recommend the owners always to keep on hand a plentiful supply of rock salt.

Liverpool, 1850.

JAMES WALKER.