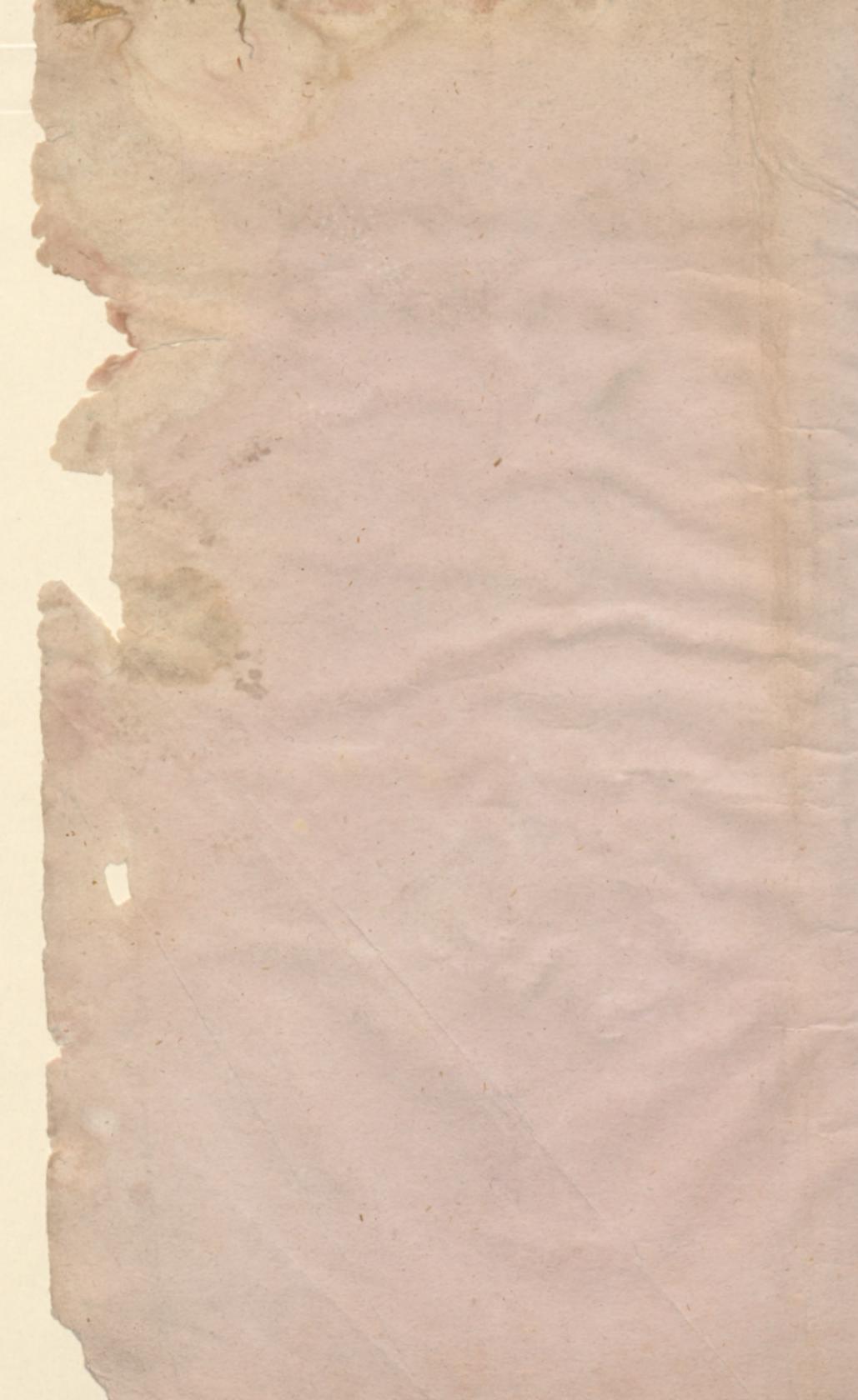


Heeringer (E)

A discovery of the true Cause  
of the disease called by the people  
TREMbles, or MILK-SICKNESS —

To be returned.





1304

A

DISCOVERY

OF THE

TRUE CAUSE OF THE DISEASE,

CALLED BY THE PEOPLE,

TREMbles, OR MILK-SICKNESS

✓

BY ERNST HEERINGEN.

Surgeon-General's Office  
LIBRARY  
27901  
Washington

LOUISVILLE:

PRINTED AT THE OFFICE OF THE KENTUCKIAN.

1843.

UNITED STATES OF AMERICA, }  
DISTRICT OF KENTUCKY, }   Sct.

BE it remembered, that on this, the 26th day of November, 1842, Ernst Heeringen, of said District, deposited in this office the title of a book, the title of which is in the words following, to wit; "A Discovery of the true Cause of the disease, called by the people, Trembles, or Milk-sickness, by Ernst Heeringen," the right whereof he claims as author and proprietor, in conformity with the act of Congress entitled "An act to amend the several acts respecting Copy Rights."

Attest,

JOHN H. HANNA, C. K. D. C.

Med. Hist.

WDC

H459d

1843

Mon. Med.

## PREFACE.

A MAJORITY of the most enlightened of our western physicians have acknowledged the existence of a disease, known under the name of Milk-sickness, and have even taken considerable pains to inform us of such facts as have come within their knowledge, regarding this terrible malady. Milk-sickness every year destroys so many valuable lives, and causes such great pecuniary losses, in the sections of country where it prevails, that the Legislatures of several States have thought proper to offer liberal rewards to any one who would discover the cause of this disease, in the hope that, by these means, they would be enabled to arrest, in its fatal career, this subtle foe to human health, happiness, and even life. The community owes thanks to those who, in order to ascertain this cause, and with the intention of discovering a remedy, have exposed their own lives, by visiting, and remaining for some time, in places where the disease rages with the greatest violence, and there, with an eye single to the noble object of their visit, spared neither labor nor expense to accomplish the great work, so replete with blessing to the human family. Some of these men have published the results of their investigations, and thus added considerably to our knowledge of the character and peculiarities of the disease. The pamphlets of Drs. Drake and Seaton have peculiarly entitled them to our warmest thanks, for the new light they have thrown upon the subject of their researches.

A disease, like the one in question, that annually destroys, in several of the States, cattle to the amount of \$200,000, and even many hundreds of precious human lives; to whose dangerous influence the citizen and the farmer are hourly alike exposed, is well calculated to excite a general interest. It is, therefore, not surprising that so many physicians have eagerly seized the sub-

ject, and with unprecedented perseverance, followed the tracks of the destroyer. But, unfortunately, their success did not equal their expectations, or their merits. I take this opportunity, however, to state, that, all my predecessors have published, has been of great value to me in my investigations; and probably, without the assistance of their important discoveries and able arguments on the subject, I should not have been enabled, at this early date, to lay before the community the true cause of Milk-sickness.

My heartfelt thanks are tendered to Judge Miller, Mr. Warwick Miller, and Mr. Isaac Miller, for the assistance and facilities they have rendered me, during my stay in their neighborhood. Mr Sylvester Shaw, an excellent man, who accompanied me on my journey for the purpose of discovering the cause of Milk-sickness, is entitled to my everlasting gratitude for the efficient manner in which he has seconded my undertaking. To Messrs. Walker Hawes, Combe, Oldham, Onan, Galloway, and Garricot, I am greatly indebted for valuable information, and demonstrations of friendship, while in the vicinity of Owensborough.

In the course of this pamphlet I have avoided, as much as possible, the introduction of technical terms; for my wish is, that it may be read and understood by the farmer as well as the professional man, hoping that it may prove as useful as I anticipate.

My being a German will account for any deficiency in the choice of language, and I rely upon the indulgence of my readers in this respect.

THE AUTHOR.

LOUISVILLE, Dec. 2, 1842.

## CHAPTER I.

### HISTORY OF MILK-SICKNESS.

---

THE knowledge of the existence of this disease extends to the first settlement of the western States of North America. Several of the oldest settlers, for example, Mr. Galloway, near Owensborough, and others, state that since 40 years they lost annually large quantities of cattle from that disease, and that their fathers before them had met with similar losses, from their first arrival in the country. I can, therefore, safely assert, that the disease is not of late or spontaneous origin, but on the contrary, has been a permanent resident in certain portions of the Valley of the Mississippi. Its occurrence is now less frequent, because we are better acquainted with its character, and in consequence, enabled to avoid, to a great extent, the coming within its iron grasp. In 1809, Dr. Barbee, first of all, publicly declared the existence of the Trembles; and since then, numerous able and minute observers have communicated to us the result of their researches. But, notwithstanding their praiseworthy exertions, the disease still continues to rage, and annually carries off a great number of victims. It sneaks, like a thief at night, and prostrates before its presence is known—spares neither mother, father, child, friend, neighbor, nor traveller—frequently ruins, in one month, a stock of cattle, that has cost to the proprietor many years of hard labor. Many farmers are entirely ruined by it; their lands are of no value to them,

since such a dangerous foe has chosen to make them his residence, and at last, tired and discouraged, they sell their farms at almost any price, and feel as glad to leave the neighborhood as the French were to leave Russia. Thus it is that Milk-sickness proves to be a curse to any country in which it prevails.

Dr. Drake, some years ago, made a tour of about 150 miles, visiting several places where the disease carried on the work of destruction, and in a pamphlet, written with his usual ability, made us acquainted with his views on its cause and character.

Dr. Seaton, who shortly afterwards set out for the same purpose, could not agree with Dr. Drake, that the cause was to be found in the vegetable, but on the contrary, thought it to be in the mineral kingdom. They both saw that the disease was occasioned by some poison, but neither of them could satisfactorily show whether it was a vegetable, mineral, animal, or miasmatic poison. The unsettled condition of this important question prompted me to repair to the scene of Milk-sickness, and there to enter into a systematical examination of the locality.

---

## CHAPTER II.

SINCE three years, I have paid particular attention to the diseases of climate among cattle, horses and mules, such as they occur in the different western States, and found that, besides the diseases that are well known in Europe, there are three of frequent occurrence in this country, of which comparatively little is heard on the continent of Eu-

rope. These are: the Big Head, among horses, the Hollow Horn and Trembles, among cattle.

My curiosity being peculiarly excited by the various and sometimes contradictory statements about the character of the Trembles, I concluded to repair, in persona propria, to some place where I might have a chance of observing the disease. I therefore removed to Madison, Indiana, whence it is not far to a place called "Poison Mount," where, after the first frost, a large number of cattle are annually killed by Trembles. The most remarkable peculiarity of this locality consists in this, that no case of Trembles is to be found within 20 miles from this Mount, the space of about 250 acres, of which it is composed excepted. This fact is so well known, that if any cow remains from home beyond the usual time, the proprietor goes to this Mount to see whether she lies there sick or dead, and frequently he finds his suspicion verified. Some farmers in this neighborhood keep their cattle fenced up in the pasture, experience having taught them how unsafe it is to let them run at large. Even in summer some cases of Trembles have been observed there. The forest on the Mount contains 26 different species of wood, which I will quote here under the same names as the farmers are wont to call them:

- |                             |                   |
|-----------------------------|-------------------|
| 1. Yellow and white poplar. | 14. Pawpaw.       |
| 2. Sugartree.               | 15. Spicewood.    |
| 3. Black and white ash      | 16. Bitter sweet. |
| 4. Maple.                   | 17. Grapevine.    |
| 5. Beech.                   | 18. Coffee nut    |
| 6. Linn.                    | 19. Hackberry.    |
| 7. Black and white walnut   | 20. Dogwood.      |
| 8. Black and sweet gum      | 21. Sassafras.    |
| 9. Buckye.                  | 22. Plum.         |
| 10. Mulberry.               | 23. Hazle.        |
| 11. White cherry.           | 24. Black haw.    |
| 12. Red and black oak.      | 25. White elm.    |
| 13. Hickory.                | 26. Burr oak.     |

The forest is very dense, and Buckeye, Walnut, and Burdock are most numerous in it. The soil is loose, and some ponds of depth are to be found. On closer examination, it will be found that it contains a good deal of clay, a small quantity of sand and lime stone, very little salt and metallic oxyde.

In the evening, after sunset, an odor spreads throughout the forest, similar to the one observed in a neighborhood where a quantity of flax or hemp is rotting in the water. The springs in the vicinity of the Mount, are all good, and are used by the farmer without the least disadvantage. There are seven springs close by. I have drank water from each one of them, and found it inferior to none I ever tasted. But the ponds are filled with water of a slimy, boggy nature, containing a quantity of putrifying vegetables, and thus kept in constant fermentation. The botanical character of this Mount is the same as in the adjoining country, where no Milk-sickness is to be found. I have carefully examined all the plants, collected and dried a specimen of each, and then compared them with those I collected where no Trembles have ever occurred. I have met with no metal there, iron excepted, the presence of which imparts to the soil, in some places, a brownish appearance. During my short stay in the neighborhood of the Mount, I have met with several cows that were attacked with the Trembles; some recovered, and a few of them died.

I now directed my attention towards Owensborough, Ky., where I understood the Trembles were of frequent occurrence. By the politeness of Judge Miller, Jefferson county, Ky., I was provided with a letter of introduction to Mr. Walker Hawes, a very respectable farmer in the vicinity of Owensborough, and then set out for this new field of operations. Mr. Hawes, upon inquiry, informed me that eight years ago he had lost all his cattle by the

Trembles; since then he had cleared his wood-land, turned it into pasture, deadened most of the timber, and from that time none of his cows were taken with the Trembles, although they still continued drinking out of the same spring. The vegetable growth on his place, he assured us, was in no ways altered, but still alike to what it was at the time he lost his stock.

I next visited Mr. Combe, a neighbor of Mr. Hawes. He informed me that he had never known any thing of the Trembles, on his place. The spring, whose water his cattle make use of, arises out of a bed of coal. There is a school some short distance from this spring, where about fifty children are taught. They have used this water for several years, without the slightest disadvantage. The vegetable growth in this place I found to be the same as it is near Madison, with but few and unimportant exceptions.

Next I went to the farm of Mr. Galloway. He stated that in the space of forty years, the Trembles had destroyed something like one hundred and twenty-five head of his cattle. That himself has had Milk-sickness twice. He keeps no more cattle, as it would be of no use to him, nor any body else. The milk of a cow affected with the Trembles, he said, looks blue-black, and has a bad odor. But if such an animal is put into the stable, and well taken care of, the appearance of the milk would change in two to six days, and the animal would perhaps recover altogether. He further states that the cows do not look very sick, as long as their calves live, or until they are no longer milked. On opening such cows he generally found in the stomach a large quantity of a slimy, bad smelling substance, in which he could distinguish clay, putrified grass, &c., the whole looking very much like the surface of foul stagnant water.

He further told me that if I wished to see the cows in

the act of trembling, I only need go to the woods and chase them about for a little while, and six out of ten would begin to tremble in consequence of this exercise. I did so, and found this statement to be correct.

In a room where there is a patient laboring under Milk-sickness, a peculiar odor exists, similar to the one, he said, that the milk of a sick cow possesses. That a person who once had Milk-sickness will ever after present this peculiar odor in perspiring. The same statement was made by several others in this neighborhood.

Mr. Oldham, another neighbor, on whose farm I remained ten days, told me that in nine years he had lost about fifty head of cattle from the same disease, although he only kept eight or ten head annually.

His description was like the one of Mr. Galloway, but he thought the cause of Milk-sickness was mineral poison in the water. Notwithstanding himself and family continued to use the same water without injury. He had Milk-sickness twice himself, but then he acknowledges it was in consequence of using the milk of a cow which proved to be poisoned. He said that some of his family were taken ill after using milk, while others, that had used of the same, never felt any the worse for it, and that the physicians he employed in such cases, declared the disease to be congestive fever, and not Milk-sickness.

Mr. Roman, another farmer in the vicinity, told me that three years ago he lost from the first of September to the first of October thirty head of cattle by the Trembles; that within the last thirty years he had lost at least one hundred head, and he had observed that disease in his neighborhood had occurred most in dry hot weather, or after a sudden change. He thought the poison must be contained in the atmosphere, because the air in those parts where the disease prevails most, exhibits after sun-

set a very unpleasant, infected odor. The general opinion of the farmers, however, is that the poison is contained in the water; because the sick and dead animals are generally found close to some pond or spring, where evidently they have been drinking, and then were unable to leave the place. But this opinion is erroneous. I believe that the sick animals, tormented by fever and exhausted already to a great degree, drag themselves to some watering place in order to quench their thirst. They drink an uncommon quantity of the water, and the exertion or the heavy weight of the fluid on their stomachs, prostrates them at once, and they are found in a condition which is not the cause but the consequence of the disease.

From Owensborough to the Green river country the Trembles prevail to a greater or less degree, and some of the farmers, to save their stock, are obliged to keep it under fence.

The woods in this neighborhood present the same appearance as those near Madison. The country is level and broken alternately. The soil is rich in most of places. The vegetable growth the same as near Madison, but the water is not of as good a quality. There are some swamps and numerous ponds filled with water of a foul and putrid nature. The springs are generally situated in deep hollows, and the rain carries a deal of dirt, leaves, &c. into them, which causes the water to be any thing but pleasant, and has thus led a great many to the belief that the water contains mineral poison. On riding through this country at night, I could plainly smell the same peculiar odor which I found near Poison Mount, in Indiana. The soil there contains ten per cent. lime, thirty per cent. clay, twenty per cent. sand, thirty per cent. vegetable substance, nine per cent. barytes, and one per cent. iron. A great deal of limestone is to be found in the neighborhood. On my return I met a gentleman on board of the steamboat

who informed me that he lived on a farm thirty miles from Owensborough, in Indiana, and that he had lost a good deal of his stock with Trembles. Four years ago he turned fourteen head of cattle into a thirty acre lot of fenced wood-land. The fence was so constructed that the cattle could, from the lot, come up to the house, where he had put up a trough to water them. The water they thus received was from the same spring, that served for family purposes. In the lot there was neither spring nor pond, and notwithstanding all these precautions, the Trembles destroyed from the first of June to the first of August the whole of this stock, without any of his family becoming indisposed. Mr. Sylvester Shaw, the gentleman named in the preface, was present when this statement was made to me, and is willing to vouch for its correctness.

Another farmer, Mr. Williams, living in the vicinity of Frankfort, told me that he had paid a great deal of attention to this disease, and had frequently observed it even in the winter season. During my stay near Owensborough, I had occasion to observe a great many cases of Trembles. One case was to me peculiarly interesting. An ox, that apparently was in excellent health, began to tremble every time he was taken up and put in the plough, as soon as he had worked but a few minutes. He had been in this condition for three months previous to my seeing him. The proprietor thought he would recover.

## CHAPTER III.

ACCORDING to all the statements I have been able to collect, it appears that:

1. A peculiar unpleasant odor originates in a room where any person or persons are affected with Milk-sickness.

2. Persons that were once attacked with this disease, transmit even a number of years after the attack, the same odor when perspiring.

3. Such persons never enjoy as good health afterwards as they did before they had the disease.

4. One and the same person is liable to repeated attacks of the disease, when coming in contact with the cause of it.

5. One person or persons may become sick in consequence of using milk, butter or meat, while others that use it also, escape the malady. This proves that a certain susceptibility or predisposition exists in those that become Milk-sick.

6. The disease may attack old persons as well as young ones.

7. Some die with the disease, although others that have used more of the poisoned milk or butter, recover their health.

8. The stomachs of persons killed by the disease are found to be very much inflamed.

9. That the functions of the intestines are paralyzed.

10. Milk-sickness is a secondary complaint, inasmuch as no person ever had it but in consequence of using milk, butter or meat of an animal affected with Trembles. However, some diseases very similar to Milk-sickness in their symptoms and character have been experienced by

persons that had not used any of the above named articles, and as Milk-sickness existed perhaps in the neighborhood; they were thus led into the erroneous belief that their diseases were of course cases of Milk-sickness.

Let us now proceed and examine the symptoms and circumstances attending the Trembles of cattle.

1. This disease attacks generally, in the first place, the stoutest and fattest of the stock.

2. It may exist in all seasons, but principally and most violent is it observed in dry seasons, or after sudden changes of the weather.

3. It occurs on the mountains as well as in the depth of a valley.

4. It is more frequent in low parts of the country.

5. Trembles are never known in a prairie, but always in wood-land.

6. Trembles are observed in sand-stone as well as in lime-stone regions.

7. The disease is not confined to those parts where the soil contains large quantities of minerals and metals.

8. It occurs where there are numerous ponds and springs, but also where there are none or only few.

9. In some places it always begins during summer; for example, in Jasper, Lanesville, Greenville and Rockport, Indiana. In others, during the fall and winter; for example, in Owensborough, Kentucky, and in Madison, Indiana.

10. Clearing the land on which the cattle acquire the disease, does generally appear to remove the cause in the course of a few years.

11. As long as a cow suckles a calf, or the milk is regularly taken off by milking, the symptoms of the malady are not to be observed, which proves that the diseased matter is entirely absorbed by the sanguiferous apparatus.

12. In the progress of the disease the milk assumes a blue-black appearance, a very offensive odor, and its use in this state is fatal to man and beast.

13. After the calf is dead, or the milk is no longer taken from the cow, and she is still exposed to the primary cause; the life of the animal is very much endangered, because the poisonous matter is then transferred to the nervous system.

14. The milk has a dirty, grayish sediment.

15. The Trembles frequently kill in the space of twenty-four hours, but in some instances they have a more protracted character.

16. An animal that has had the Trembles once, if exposed to the cause again, may have a return of the disease.

17. An animal that has imbibed the disease will show the symptoms plainly, if chased about for a while.

18. The exhalation of diseased animals is not contagious.

19. Cattle are most subject to this disease; horses, mules, goats and sheep are less so. Dogs and hogs have never been known to have this disease, except after eating the meat of some animal that was killed by Trembles.

20. Cattle are more liable to catch the disease when out during the night, than those that are kept up at night.

21. A calf that has used diseased milk for some time, may be seen to fall down when sucking the cow; but this must rather be ascribed to the exertion, which is too much for its diseased and exhausted condition, than to the influence of the diseased milk it is just then using, the bad quality of which could not possibly operate so suddenly.

The general symptoms presented by animals laboring

under this disease are weakness, heaviness, madness, running to and fro, stumbling, violent trembling during the attack, constipation, slobbering, and the effect of the milk upon those that use of it. Horses perspire profusely before the trembling takes place. On opening the bodies of such animals as had died with this disease, I generally found the mucous membrane of the stomach inflamed, the muscular fibres contracted, the intestinal canal dry, hard, and in some parts gangrenous.

Some farmers informed me that in several instances they had found the lungs also much inflamed, the spleen in a gangrenous condition, the gall-bladder full of corrupt bile, and in the stomach large quantities of a putrified, slimy and offensively smelling substance.

The bodies of such animals putrify shortly after death, with more than usually offensive odor.

---

#### CHAPTER IV.

It will be seen by reading and comparing the numerous treatises that have, from time to time, emanated from the press, and were penned by able and close observers, that the true cause of Trembles has not as yet been discovered; that each doctrine has been successfully contradicted by a succeeding one. In fact no satisfactory result could be expected from all the exertions which have been made, as the attention of the physicians, who were endeavoring to find out the cause of this disease, was mostly engrossed in observing the secondary disease, which is Milk-sickness or Sick Stomach, instead of observing the

Trembles in cattle, horses, &c. which is no doubt the primary disease and best calculated to furnish the cause by which it is called into existence.

In coming before the public with the promise of pointing out the true cause of Trembles, I am well aware of the responsibility I assume, and I assure the reader, that only a thorough conviction, based upon a long series of experiments and observations, and close study upon this subject, could ever prompt me to embark in a vessel, on board of which so many before me have been wrecked.

The disease, called Milk-sickness attacks men only in consequence of eating the milk, butter or meat of an animal laboring under Trembles. This may be considered an undeniable fact; and therefore it may be asserted, that the cause of Milk-sickness has been known to the community long ago. But what service has been derived from this knowledge? I say none.

Thus it will be seen that in order to put a stop to Milk-sickness, the cause of the Trembles has to be found out first, and the means provided for the annihilation of this cause. It is obvious that the farrier is better adapted to this task than the physician, who would hardly go to the trouble, or would perhaps consider it derogatory to his dignity, to pay so much attention to the sick animal, as is required for our purpose. The discovery of the cause of the Trembles lies not within the province of a doctor, but necessarily ranges into that of the farrier. Thus we may account for the abortive efforts of the learned and skilled men, who have hitherto labored for the triumph and glory connected with this important discovery. These are the reasons for which I have thought it my duty to enter the field, and hope that my exertions may prove useful, as I wish them to be.

Before I progress any farther in my statements, I deem

it proper to insert here some extracts from the able work of Dr. J. F. C. Dietrich, of Berlin, in Prussia, on Special Pathology and Therapeutics. The quotation will convey an idea of some diseases well known to every practical and scientific farrier, and becomes important to me by comparing the symptoms and characters of diseases there spoken of, with the nature of the one we have now under consideration. In §1104 of the above named work he says :

*Of Epidemics in General.*

§ 1104.—Epidemics are those diseases by which a great number of animals, sometimes the whole of a flock, are attacked at the same time, or at short intervals, with nearly the same symptoms, and which are occasioned by some uncommon and general cause. From this circumstance they have derived the name of *Panzootia*, (flock diseases.)

§ 1105.—Some of these diseases are produced by a contagious poison, containing a principle peculiarly nuisible to one or the other species of animals, which by some means is communicated to them from without, either directly or indirectly, and possesses the quality to produce the same disease in the same species of animals, by means of which it reproduces itself. This takes place in those diseases which are called contagious, such as murrain, (*Pestis boum, Bovilla*,) or sheep-pox, (*Variolæ ovium*.)

§ 1106.—Some contagious diseases are ever called forth by some contagious principle of foreign origin, which never arises in our country primarily; but after it is once brought among us, it reproduces itself, and exercises its injurious influence upon a greater or less number of the same species of animals, among which it has settled. This is a contagium, which might properly be called *vagrant*, because it goes from one place to another, from one section of the country to another, wherever it finds means by which it is nourished. Neither weather nor season are able to stop its progress. The only manner

in which it can be limited, is to not let any healthy animals, of that species among which it rages, come in contact with it.

§ 1107.—Others are produced by a combination of general causes, operating in a peculiar manner upon one or several species of animals, and differing according to local circumstances, weather, season, or the predisposition of the animals to the disease. To this class belongs the inflammatory fever, cow-leeches, joint murrain, &c. of the spleen (anthrax.) In this disease a contagious principle develops itself also, or the disease may have been produced by it. However, the contagious quality of this disease does not extend beyond the immediate neighborhood of the affected animal, but any thing coming into close or occluding contact with it, will most assuredly feel its influence shortly afterwards.

§ 1108.—From what is said in the previous paragraph it will be seen that this contagium is not properly organized and independent, but owes its development to accidental circumstances, and as soon as they cease, the production of the contagium ceases also, or at least it loses its power upon the animal economy.

§ 1109.—It is therefore not to be looked upon as a veritable contagium, because it depends on the disease for existence. But once produced it is very powerful, attacks all species of animals without distinction, whenever they come within the sphere of its action. A disease thus imbibed is always very dangerous, and an animal that has once recovered from it, is fully as liable to have it again, when exposed to its exciting cause, as the one that never has had it.

§ 1110.—There are still some other epidemics that, although imported at first from abroad, have now become domesticated among us, and are kept up by some atmospheric vicissitude. In these a contagium is developed, possessing volatile and fixed qualities, which are capable of reproducing the same disease in healthy animals of the same species, for example in glanders, &c.

§ 1111.—A similar state of things exists in the Farcy, where, not only the secreted lymphatic fluid applied to a healthy animal may reproduce the disease, but where also small insects are generated, that contribute to the propa-

gation of the disease. All these diseases are included among the contagious epidemics, notwithstanding the difference in the quality of each separate contagium.

§ 1112.—There are also noncontagious epidemics, which are technically termed *Epizootiæ pura*. They are produced by general atmospherical vicissitudes, and operate according to individual predisposition; the fever accompanying them imparts to the disease its peculiar character. They continue but a short time, and no contagious principle is produced by them. Under this head we may name the periodical epidemics, which are occasioned by a sudden change of the weather or of the food, principally in the autumn and spring, change of locality or climate when animals are transported from one part of the country to another.

§ 1113.—When the causes of some such disease are limited to a certain village, region, stable, or when the disease depends on certain local circumstances and becomes endemic, has no regular course, and from the continuance of these local causes, attacks at certain seasons almost all the healthy animals not only, but also those that have had the disease before, then it is called *Enzootia pura*.

§ 1115.—But these diseases may also depend on causes of a general nature, return regularly at certain seasons of the year, at the same place, and annually attack a number of animals—for example, *Cachexia ovium kyeapica*.

§ 1116.—These *Epizootiæ* and *Enzootæ* are not contagious, although the effluvia of a number of animals laboring under these diseases, may produce disease among the healthy animals that come in contact with it. It is not to be wondered at that the atmosphere in the neighborhood, where there are many sick animals, should become dangerous to those even that are healthy, but this cannot be called a veritable contagium, because it does not always contain the same specific principle.

§ 1116.—When therefore several animals are attacked in this manner, and the disease assumes a malignant character, the cause is founded upon a miasmatic vicissitude, and not upon a contagium. This miasma owes its existence to unfavorable local circumstances, putrefaction of a quantity of organic matter, animal effluvia, &c., all of

which may produce various derangements of the animal functions.

§ 1117.—Contagious epidemics are imported into our country from the south-east and east of Europe and Asia, and after one animal is attacked by this contagium, it will communicate itself to all those of the same species that come within its reach, without exercising the least injurious influence upon animals of other species, as long as the contagium has its specific quality purely.

Diseases thus produced have a regular course and fixed period of duration, from which they do not deviate, although various influences may aggravate or mitigate their character. However, the murrain attacks those breed of cattle, related to the one, to which it originally belongs, with less violence, than those that are of our home breed. Contagious epidemics never attack the same animal more than once, although it may afterwards come again within the reach or even into close contact with the contagium.

§ 1118.—The various modifications of Anthrax are originally with us from a combination of panzootic vicissitudes, such as the effluvia of swamps, pollution of the atmosphere from the putrefaction of animal and vegetable substances, that exercise a peculiar influence upon animals of certain species. However, animals of all species are subject to these diseases, and in their diseased condition, or when dead in consequence of it, they become dangerous to men and beasts, who come into inoculating contact with them. These diseases have no fixed period of duration, for this depends mainly on the disposition of the individual, constitution, situation, &c., by which the character of the disease is formed. They cease so soon as the causes above named are removed.

§ 1119.—Some other contagious diseases originate in this country at certain times from general injurious influences, the weather, food, locality, over-exertions, &c., for the contagium has become domesticated among us, and once established they possess, like all other contagious diseases, the quality of being transferred upon other animals of the same species; but usually they rage neither with so much violence nor to such an extent as those whose contagium has been imported from the orient, and is of a more volatile nature. The violence of these dis-

eases depends however very much on the degree of the noxious influence, or the length of time it has been operating, and last but not least upon the medical attention which is bestowed upon the diseased animal. They may also attack the same animal as often as it is exposed to the contagium. Some of them prove frequently fatal.

§ 1120.—In order to ascertain whether a disease is an epidemic, the following circumstances have to be taken into consideration:

1. The duration and course of the disease. Whether it has regular fixed periods, and whether there is a similarity of pathological phenomena in all cases.

2. The cause or origin of the disease. If there are no obvious panzootic vicissitudes to be discovered, the supposition arises, that the disease is contagious; this becomes the more probable, when there are but a few animals attacked at first, and the disease gradually seizes all those that come into close contact with the former, until it is generally diffused. Experiments of inoculation are infallible means, by which to ascertain the existence or absence of a contagious principle. If the disease is preceded by sudden changes of the weather, temperature, or locality, food, pasture, &c., to whose influence we may reasonably ascribe the nature of the disease, then it is to be classed under the non-contagious diseases, and called Epizootia. Still further proof is added to this Diagnosis, when the disease does not extend beyond the limits, where the apparent cause exists, and where in different parts of the country under the similar influences, the same disease sets in among animals that have not been in contact with others that were thus affected.

3. Post mortem examinations of animals dying from the disease, generally impart a great deal of information about the nature and character of the disease.

4. Does the disease prevail among one or several species of animals? What are the circumstances seemingly favorable to its origin? Is the disease similar in character to one that rages in some distant part of the country? The investigation of these questions frequently throws a great deal of light upon an obscure disease.

5. In order to establish a correct diagnosis of such a disease, it is necessary to sum up all the pathological

phenomena which it presents. The pulse, state of the bowels, looks, appetite, voluntary and involuntary movements, respiration and conduct of the diseased animals, have to be taken into particular consideration.

§ 1121.—The treatment of epidemics is limited: First, to the prevention of all intercourse between the sick and healthy animals, either in a direct or indirect manner. This is no doubt the best and most useful proceeding in contagious epidemics, and the only one by which the progress of the disease can be effectually arrested.

2. To the mitigation and removal of the causes by which the disease was occasioned. This proceeding is called the prophylactic and is of the greatest importance, inasmuch as it will be useful almost under any circumstances; for even the influence of the weather may, by proper arrangements, be made to lose considerable of its noxious effect upon animals.

3. To the removal of the disease itself, the mitigation of the symptoms and prevention of all that might occasion an increase of the violence of the disease. This is called the medical treatment, and besides the above named duties, it belongs also into its administration, to see the bodies of the dead animals buried as soon as possible, and in a place where it is most likely that no animals will visit.

Dr. Dietrich, in his work, then goes on with the description of the murrain, (*pestis boum, bovilla, typhus boum contagiosus*), and the sheep pox (*variolæ ovium, ovinæ*), I shall pass over both of these, because they have no relationship with the disease we have under investigation. Next comes a description of several modifications of anthrax, from which I shall quote some extracts, as I consider them of the greatest importance in the chain of my arguments on the subject of Trembles. He says:

§ 1183.—The various anthrax fevers (*febres ataxo adynamica*) are diseases with which it is very important to become familiarly acquainted, because they frequently originate in this country from general panzootic causes,

local circumstances, &c., and are not like some other contagious diseases imported from distant countries; they sometimes attack animals of all species, render some important organs very much disposed to gangrene, and thus prove very fatal.

§ 1184.—Anthrax (mortification of the spleen) is the form under which we meet this disease most frequently.

§ 1185.—Anthrax (joint murrain) generally makes its appearance during the hot and dry season; it does not communicate itself to animals of the same species in the same manner as murrain or sheep pox are communicated; the contagion of this disease is to be effected only by close contact or inoculation with the saliva, blood, excrements or the use of the meat, milk, &c., of the diseased animal. But under these circumstances the contagium will operate alike upon animals of every description. This disease has no regular period of duration, and its most prominent feature is, the disposition to decomposition and putrefaction accompanying it in every instance.

§ 1186.—The symptoms of anthrax are very numerous and very frequent, because this disease undergoes a great many modifications; it has therefore been divided into three species: First, anthrax acutissimus; second, anthrax acutus; third, anthrax carbuncularis.

1. Anthrax acutissimus kills animals frequently in a few hours, but sometimes they linger for twenty-four hours with the disease.

2. Anthrax acutus seldom proves fatal in less than from two to eight days.

3. Anthrax carbuncularis, continues for weeks and even months, and animals affected with it are frequently covered with nodes or boils in several parts of the body.

§ 1195.—Horses are also liable to attacks of anthrax and there a profuse perspiration precedes the other symptoms.

§ 1197.—Anthrax occurs also among sheep.

§ 1203.—Anthrax rages generally in hot seasons and in swampy or broken places it is observed most frequently. Sudden changes of weather from warm to cold, change of food, want of pure water, or the use of stagnant, fermenting water, &c. may be considered as causes of anthrax: The propagation of the disease may be effected

by bringing some excretion of the diseased or dead animal into such contact with an healthy body, that its poisonous quality may be absorbed by him and brought into the circulation, or by the use of the meat, milk, &c. of a diseased or dead animal.

According to the views expressed by Dr. Dietrich on the subject of epizootics, we must come to the following conclusions, that there are :

1. Contagious epizootics, that from the volatile nature of their contagium, propagate themselves by means of the atmosphere, but attack animals of one species only—for example, the murrain, &c, they are called contagiones pura.

2. Contagious epizootics which attack animals of every species, when they come within the reach of the effluvia of animals that are laboring under such diseases, or when they use their meat, milk, &c. This is the case with the anthrax; (inflammatory fever, cowleeches, graziers, joint felon, joint murrain, &c.) In all of these diseases the contagium is fixed or limited, and possesses not the volatile nature spoken of in the former number. They are called contagiones impura.

3. There are others whose contagium possesses both fixed and volatile qualities, glanders for example. Epizootia pura and impura contagions occur very frequently in America, but fortunately for this country, the genuine contagious epidemics, such as murrain, have to my knowledge never been observed here. I think I have by the extracts quoted on the preceding pages, enabled my readers to judge for themselves whether, in forming my diagnosis of the disease called Trembles, I am entitled to their confidence in my assertions, and will therefore proceed in the performance of this task. I consider this point the most important, because, from it depends as

well the prevention, as the cure of the disease, and when we are once correctly informed as to the nature and character of the disease, it will be a matter of no great difficulty to discover also its true cause. The philosophical principle laid down by Dr. Guy W. Wright, with reference to diagnostic and which is to be found in the seventh number of the first volume of the *Western Medical and Physical Journal*, is as follows:

“In the investigation of all anomalous diseases where the cause is unknown, or very obscure, the most philosophical course of inquiry is first to consider its analogy to those known diseases, to which they bear the greatest resemblance, and then, if the treatment will sustain the comparison, it is circumstantially proved, that there is a proportionate relation in the cause of either.”

Without fear of contradiction it may be said that this is the most rational manner of investigating an obscure disease, and, like Dr. Seaton before me, I have in my researches followed the advice of Dr. Wright.

In § 1120 Dr. Dietrich also gives directions to the farrier for the comprehension of diseases and establishment of diagnosis, which have been of great service to me.

Milk-sickness, as it occurs in men, is undoubtedly an epidemic, and the physicians, who are alluded to in the following article from the *Western Medical Journal*, in Vol. iv. No. v. page 370, No. xxxiii:

“In conclusion, we ought to observe, that there are physicians who deny that the disease called Milk-sickness is a specific malady, and insist that it is nothing more than autumnal fever of a congestive type, attended with great irritability of the stomach;”

Are most assuredly nearer the truth than those who look upon Milk-sickness as a disease produced by the operation of some vegetable or mineral poison.

Now if Milk-sickness is an epidemic, the Trembles, causing Milk-sickness, must necessarily be an epidemic (or Epizootia) also. This deduction is logically correct, and defies contradiction, for who did ever hear of a lioness bringing forth a sparrow? But on the other hand, the knowledge that Trembles is an epidemic, becomes very important to refute some doctrines that have been laid before the public heretofore, the authors of which tried to demonstrate that this disease was occasioned by some vegetable or mineral poison.

Now I would ask those gentlemen, whether they ever heard that a mineral or vegetable poison could produce an epidemic? In order to define this disease more accurately, we have to inquire now, to which of the epizootic diseases it properly belongs, or whether it is an independent and newly discovered epizootia.

We find upon inquiry that it is not a disease purely contagious, inasmuch as it attacks animals of several species, which a pure contagium, according to Dr. Dietrich, (§ 1105 and 1117,) is not capable of doing.

It is not an enzootia pura either, because the contagium there, is not capable of reproducing epizootia in other animals, but the contagium of Trembles does this, for we know that the milk and flesh of animals, laboring under this disease, reproduces epizootia, not only in other animals, but also in men if they make use of these. Thus it will be seen that the Trembles are an epizootia; belonging to the family of anthrax fevers; their contagium is fixed, and the exhalation of diseased animals does not reproduce the disease in others that come in contact with it, and therefore we must consider it as a separate and independent member of the anthrax family. According to § 1107, 1108, 1109 and 1185, the milk, flesh, &c. of diseased animals affected with anthrax, possess the power

of reproducing the same disease in all those that make use of these articles. All this being the case in Trembles, I would have no hesitation in pronouncing the Trembles to be identical with anthrax, if there were not several other features in anthrax, which we do not find again in Trembles, and *vice versa*, for example: The exhalation of animals affected with anthrax transplants this disease upon all animals, without respect to their species, that come in contact with it. This is not the case in Trembles. On the other hand a prominent symptom of the Trembles is obstinate constipation, but this does not attend in anthrax.

From all circumstances I am compelled to believe that the Trembles belong to the anthrax family, of which they are a distinct and independent member. The most proper name for the disease, would be the following: *Epizootica Americana aut Febris ataxo acutissimus cum caractere contagiose*—or in English, Trembles—which is as good a denomination as any that could possibly be made use of. Milk-sickness, or sick stomach, should be baptized *Epidemica Americana Secundaria*. Having thus, upon philosophical principles, established the diagnosis of Trembles, it becomes my task now to define its cause in such a manner, that there cannot be the slightest doubt as to the correctness of my assertion, In a preceding part of this treatise, I have already stated that, in all those places where Trembles rage, I have found sufficient, according to §1107, to account for the production of anthrax fevers; for example, the large quantities of vegetable matter putrifying in the neighborhood, unfavorable local circumstances, impure and stagnant water, &c. and thus it is obvious that these causes are also to be considered as the ones which produce Trembles. I will also here refer the reader to Mason's Farrier, an excellent work, in which

he will find, that these same causes have long been known in certain parts of the country to occasion joint murrain or inflammatory fever, &c.

Before I go any farther, I will once more say that I declare the Trembles to be an epizootic disease, a member of the anthrax family, possessing, however, some peculiar features, and caused by local circumstances, such as swamps, putrifaction of vegetable and animal substances, stagnant and fermenting water, sudden changes of weather, hot weather, or in one word by Malaria, attended with some peculiar qualities, favorable to the production of these specific morbid phenomena.

But deeming it necessary to add still further proof that nothing else can be the cause of Trembles, I will now discuss the merits of the poison doctrines that have excited, in no small degree, the attention and interest of the community, although they were nothing less than the causes of Trembles, and it seems to me very easily refuted. Why is it, that the Trembles are not occasioned by one or several poisonous plants?

Dr. Drake, in his pamphlet, page 44, says the following:

“At first view, all the circumstances would seem to be in favor of this division, as furnishing the special cause. The disease begins in herbivorous animals: They feed among plants, many of which are virulent; it is a well known general fact, that cattle sometimes kill themselves by eating noxious plants; many pre-existing facts go to show, that the flesh and secreted fluids of herbivorous animals are often modified by their food; and that substances of unusual color or odor, not unfrequently manifest their presence, or that of some of their elements, in the solids of the body and in the fluids and gases excreted from the kidneys, the skin and the lungs. There is then much plausibility in the opinion, that the Trembles are occa-

sioned by the eating of a plant, while there is nothing physiologically absurd in the hypothesis of a contamination of the flesh and milk of the animal. Here then we have a substantial foundation to stand upon, and from whence to extend our inquiries after the particular plant. But before we commence, it is proper to refer to an opinion held by some persons in the district, that the disease may be the offspring of several.

“This we consider untenable, inasmuch as different poisonous plants vary from each other in their mode of action and effects, and, of course, the symptoms vary; but the symptoms of Trembles are remarkably uniform, as much the same, indeed, as those produced by opium, tartar emetic, arsenic, or the preparations of lead. For a plant to produce the Trembles, it must be one that is noxious; that is not very minute, for the cow when placed in the midst of abundance, is disposed to browse on the larger; it must be acceptable to the taste of cattle, horses and sheep, not to extend the catalogue, or else it will not be eaten by all which contract the disease; it must be in leaf in autumn as well as summer; it must grow abundantly in and around the spots which generate the disease, and sparsely or not at all in the surrounding plateaus, or in other localities of the district; lastly, it must be liable to destruction under simple deadening of the timber, harrowing of the ground, and scattering over it the seeds of any of the grasses.”

Let us now dispose of the argument of this quotation, and say—

1. Farmers are well aware that their cattle are sometimes poisoned from the use of some noxious leaf or plant; but they are also aware from the symptoms what special plant they have been using; the experience of those living on spots, where such noxious leaves and plants are abundant, has taught them to be well skilled in discerning this subject; for example, there is hardly a farmer to be found who cannot tell, on seeing a cow that has eaten some buckeye leaf, that the cow is buckeyed.

2. Cases of sick cattle from the use of poisonous plants occur but rarely, for generally but those are apt to be poisoned that eat very hastily and never get enough.

3. We have never heard of any plant that has been capable of imparting to the milk such a peculiar odor, as is observed in the milk of animals affected with the Trembles. Frequently the color, odor and taste of the milk of a healthy cow indicate sufficiently what kind of plants she has been mostly fed with; but in Trembles, the taste and odor of the milk bears some considerable resemblance to that of Malaria.

4. It will be difficult to show a plant that grows at all seasons of the year, even in the winter, and which possesses the qualities required for the production of a disease like Trembles. The few plants remaining in October and November, or after the first frost, are too well known to be for a moment suspected as the cause of this terrible malady.

5. I have compared all the plants which I found near Madison, on the spot that is well known to breed Trembles, with those that grow in a part where the Trembles never occur, and have not been able to discover the slightest difference between them.

6. Nature has endowed herbivorous animals with an instinct, by means of which they are enabled to avoid all those plants, the use of which would prove injurious to them; it is hardly possible that so many animals should annually poison themselves in eating.

7. Mr. Simpson, near Madison, states that he has fenced one acre of land, which was known to breed the Trembles; he put in this lot three head of cattle, and they were all attacked by the disease; three physicians repaired to the lot, examined every plant contained within it,

and found none among them that could be called noxious.

8. The peculiar odor existing in the rooms of milk-sick patients, has never been observed in persons poisoned with any noxious vegetable.

9. Mr. Walker Hawes's statement is a very clear and forcible proof against the possibility of Trembles being occasioned by vegetable poison, for although he did not plough the land, and therefore the plants remained still as they were, he put a stop to Trembles on his plantation, merely by deadening the timber; and instances of this kind are very numerous.

10. We have undeniable evidences that there are places where Trembles have occurred frequently, and still in the same places, although a large number of cattle may visit there, not one of them is taken with the Trembles for one or two years, and the following season the disease may reappear in its full and unmitigated violence. The reason of this is obvious. Circumstances have, during that period, not been favorable to the production of the peculiar malaria which causes Trembles. But if the cause were a noxious plant, the disease would surely reappear in the same place every season, without exception. The same is the case in New Orleans, where for one or two seasons there are none or very few cases of yellow fever, but in a succeeding season almost every one is seized by this disease. Prof. Drake, in his pamphlet, mentions an instance of a Judge Harold, in Ohio, whose cattle were in a pasture for six years without any case of Trembles occurring among them, but in the seventh year a number of them were laboring under the disease. The next season he deadened the timber of this pasture, and turned again some cattle into it. The first year after deadening he lost but a few sheep, the second year still

less, the third and following years there was not one of them affected with Trembles. This is another link in the chain of evidence that malaria is the cause of Trembles. For the deadening of timber prevents an annual putrefaction of the falling of leaves, which must be considered as quite an ingredient in malaria, and therefore the deadening of timber alone will suffice, if not to stop the disease entirely at once, to lessen the cases in a surprising manner.

11. Dr. Seaton has already satisfactorily shown, that the cause of Trembles is not to be ascribed to any vegetable poison. He even went so far as to state that the poison vine (*Rhus toxicodendron*) which has so long been suspected as the cause of Trembles, is on the contrary made use of by the farmers as a remedy against Trembles, with no slight success.

But in addition to the testimony of Dr. Seaton, we know very well, that the poison vine grows in places and is eaten by the cattle, where no cases of Trembles have ever occurred.

12. The excellent works of Wood and Bache, U. S. Dispensatorium, and Dr. Tarrey and Gray's Flora of North America, contain no account of any poisonous plant, possessing the qualities which the one, capable of producing Trembles, must necessarily be endowed with. In Europe, where there are a great many poisonous plants growing in abundance, no Trembles have ever been heard of; but epizootic diseases occur there frequently, and the greatest degree of caution and vigilance alone is capable of preventing their spreading extensively.

Having thus discussed the question whether Trembles are caused by some noxious plant or plants, I hope that none will hesitate to say, that plants have erroneously

been suspected; we will now proceed, and inquire what share mineral poison has in the production of Trembles and Milk-sickness.

---

## CHAPTER VI.

1. DR. DRAKE has already used very strong arguments, by which he refuted the doctrine that Trembles were caused by some mineral poison. I shall add to these, that in the neighborhood of Owensborough I found but very little mineral in the soil, and Mr. Combe proved to me that although his spring arises from a bed of stone coal, there is no mineral poison existing in it.

2. Metals are found in spots where no Trembles occur:

3. No physician has ever informed us that he has observed any such odor in the room where there is a person poisoned with mineral, as the one attending in the rooms of patients affected with Milk-sickness.

4. The symptoms of animals attacked with Trembles, will, by every well informed farrier, be found to be those of epizootia, and not of poison.

5. Poisons always operate very rapidly, but we know that Trembles sometimes continue for a long time.

6. Dr. Seaton is right, when he says that animals feeding upon clover are not so much subject to Trembles as those feeding upon any other grass. The reason, however, he assigns for this, is false, when he says, that it is on account of their not receiving so much arsenic, inasmuch

as they do not drink much of the spring water containing this poison. The facts of the case are these: Clover contains a great deal of watery substance, and quenches the thirst of animals feeding on it; it is also very cooling. The consequence is, that animals eating clover will not drink so much putrified, stagnant and fermenting water, as those feeding on some other substance, calculated to produce thirst instead of quenching it.

7. Dr. Seaton is also wrong, when he says, that cows that are well salted do not go so much to the springs, and therefore receive less arsenic. Now every farrier and almost every farmer knows, that salt purges gently, and dissolves, and thus proves a deductor of impurities contained in the prima via; but also they do know, that salting makes the animals drink more than they otherwise would have done. But I say, Let the shoemaker stick to his last. For the correctness of this, I refer the reader to any good work on veterinary practice.

8. We know already, from the statement of Mr. Walker Hawes, that, since he deadened his timber some eight or ten years ago, he loses none of his cattle with the Trembles. Now, if the mineral poison causes Trembles, how does it come that, it being still there in the soil, and his cattle still grazing there, and still going to the same spring for water, they are no longer subject to the Trembles? Every thing is there as it was eight years ago, with the exception of an immense quantity of leaves that were annually falling and putrifying on the premises, and which process, we all know, originates malaria in no small degree.

Arsenic is one of the most powerful mineral poisons. Who will be surprised, therefore, when Dr. Seaton says, that, in giving to three cows sixty grains of this mineral

in one day, and twenty-four grains at a dose, two of them died in forty-eight hours after receiving the first dose, and one of them was very near dead. But he has proved nothing else by this experiment, except, that arsenic is apt to kill cows — a thing which every schoolboy knew before; inasmuch as the calves that were sucking the cows during the time of these experiments never felt the worse for it, and the hogs and dogs that ate the flesh of the dead cows were nothing the less incommoded after their hearty meal. I would therefore take this opportunity to say, that it would probably have been much better if Dr. Seaton had made the above experiments previously, instead of making them after having frightened the community by his arsenic pamphlet.

Trembles occur where there are none or very few metals; and again; there are places where different kinds of metals are very abundant, and no Trembles. Moreover, Wood and Bache have so amply described the symptoms of every mineral poison, that it will be an easy matter for any man of sound judgment to see that the Trembles are not caused by any mineral substance, when he compares the symptoms of this disease with those named in the above work.

#### CHAPTER VII.

EVERY person knows that Trembles are not caused by an animal poison. I have shown that they are not caused by vegetable or animal poison either. All that remains

for me to do now, is to prove that the cause is contained in the atmosphere, to convince any candid minded person that nothing else can produce Trembles.

Dr. Seaton says, in page 14 of his pamphlet;

The theory that supposes the cause to be atmospheric, will receive a short notice again, and will then be discharged. We cannot suppose that situations, distinguished by geological features before mentioned, and those alone, that would cause a disease with such fearful consequences. There is no peculiarity of aspect that should give to those districts such unrivalled precedence. And, notwithstanding those diseases do obtain in the milk-sick regions, which are admitted to be of miasmatic origin, yet they do not abound to a greater extent, than they do in very many localities where the milk-sickness is not known. Again; milk-sickness very often obtains wherethe miasmatic diseases do not appear in a corresponding ratio; as, in the dead of winter, the spring and early summer months, &c. &c. They differ in another essential feature, viz: during dry seasons the milk-sickness abounds most, uniformly, at all points, while it is generally the more low and marshy situations only that suffer with the different forms of malarious diseases at such times. In very wet seasons the milk-sickness occurs but rarely, while the higher lands suffer most from miasmatic ailments. Here is a distinction of manifest prominence, when we reflect, that milk-sickness is as much the plague of the high as of the low lands, as it shows itself in regions which are more or less broken and irregular.

In complete corroboration of my views on this subject, it is stated by some, that, since the prevalence of milk-sickness, miasmatic diseases have been observed to decline in the districts where it abounds.

In the first essay on the subject, this fact is mentioned as follows:

It however prevails (though not exclusively) in agueish situations; and intermitting diseases are thought to have declined since its appearance. [Western Journal of Medical and Physical Sciences, Vol. iii. No. 4. p. 484.]

Let us see what Dr. Drake's opinion is on this subject. In page 43 of his treatise on milk-sickness, he says :

The principal facts and suggestions in support of the miasmatic hypothesis, are :

1. The season of the year when it prevails, being the same with autumnal fever, which the argument assumes to be produced by some kind of malaria.

2. The fact, affirmed by Dr. Baskerville, a zealous advocate of this theory, and supported by Robert Turner, Enoch King, and several other respectable farmers, who cite their experience, that, if cattle be kept in pastures and yards at night, and not suffered to lie in the woods, they neither have the Trembles, nor by their milk excite the sick stomach. Whether all cattle and other animals, if thus treated, would escape, cannot, of course, be known. That particular facts of this kind, have been correctly reported, we do not feel at liberty to doubt. It is certainly in harmony with the existing state of our knowledge, that, lying through the night on the damp ground in a deep forest, should favor the action of malaria.

3. The places which originate the disease, are precisely such as we should expect to generate malaria.

4. When they are converted into tilled land or meadow, the disease ceases.

5. The soil of those places bears a striking resemblance to that of the prairies, which are natural meadows, and which might perhaps be infested with the Trembles, but for some correcting influence of the natural grasses with which they abound. These facts and suggestions, seem at first view to give some plausibility to the miasmatic theory of Trembles; but formidable objections lie against it. The greater liability of cattle that remain in the woods at night, than of those which are kept in the open fields, even if it were established as a general fact, which it is not, would not prove that the disease depended on malaria; for that kind of exposure might be only an exciting cause: nor would it explain the exemption of the milk-cow. The margins of streams and various other localities within the district, are infected with diseases which are ascribed to malaria, without generating the Trembles.

Finally, the plants which undergo decomposition in those receptacles, are of the same kinds, which are decaying in places, where the Trembles do not prevail; though, out of the same materials, placed under similiar circumstances, the same gases ought to be found. We are, therefore, in the present state of our knowledge, obliged to regard the hypothesis as unsatisfactory.

A modification of the miasmatic theory is that, which supposes the poison developed in the decay of the organic matter, to be absorbed by the water, and drunk by the animals; but this relates only to the mode of its introduction into their systems; and after being liable to the objections just stated, is still further defective, in having no analogy to support it.

1. We have already mentioned, that some physicians, who have had a good opportunity of observing milk-sickness, believe that disease to be nothing else than autumnal fever attended with great irritability of the stomach; and I have not the least doubt, but these gentlemen will be the first to agree with me in my views on Trembles: the same I dare say will be the case with those, who have found out by experience, that cattle are not apt to get Trembles if they are kept up at night and not suffered to be in the woods.

Dr. Drake says, that those spots, which generate Trembles look very much like those, where considerable of malaria is formed. He is right in so saying, although he did not stay long enough in any of these places to become very familiar with all the local circumstances.

3. At night an unpleasant and strong odor may be observed in the woods of Trembles districts.

4. On the margins of the springs and small streams in those districts, a large quantity of mushrooms arise after every rain, and there the odor is most offensive. Dr. Drake is right, when he says, that, if such lands are tilled, the disease ceases; the reason of it is, that then there will

no longer be such a vast decay of organic matter at every season, and malaria in consequence will no longer be formed in dangerous abundance.

5. The milk-cow is not exempted from the disease; only as long as she is relieved regularly of her milk by suckling or milking, the malaria is partly taken off from her in this manner, and as soon as this is no longer the case, all the symptoms of Trembles make their appearance, if she returns to the woodland.

6. The statement, that the same plants which undergo decomposition in places where Trembles are generated, are also decaying in other cases where this disease never occurs, is true, but it cannot be considered as an evidence against the malaria doctrine. For, although the decay of the same materials, placed under similar circumstances, will form the same gases, Dr. Drake has failed to examine whether the decay of these materials in the one place, is attended by similar circumstances to their decay in another.

I say, that the nature of the gas or malaria thus formed depends altogether on the character of the soil, locality, weather, &c. &c. in which the process of decomposition takes place; and thus we are enabled to account for the generation of Trembles in one place, and their absence in another, where a superficial glance at the local circumstances would lead to the belief, that, if malaria is the cause of this disease, it ought surely to occur there frequently and violently. And thus it is that Trembles occur on one farm, when the adjoining one remains entirely free from this plague.

7. It cannot be surprising, that malaria of malignant character should be generated in the forests of this country, when we pause for a moment to reflect, what large

quantities of organic matter have been decomposed on the ground that we are now occupying; and even now the forests are, in some parts of the country, so dense, that the vapors arising from the earth cannot ascend, and the influence of the sun, wind, snow, rain, &c. upon the soil cannot be fully exercised. Moreover, a great part of the country, is level, and water of all descriptions abound.

8. From the statement of Mr. Walker Hawes and other respectable farmers, we learn that, since he has deadened the timber on his land, no case of Trembles has occurred there. Now, the minerals and plants that were there when he lost all his cattle, are still there; only by deadening the timber he stopped the annual process of putrefaction of leaves, &c., and procured a free outlet to the vapors of the soil. The influence of the sun, &c., upon the soil, can now operate efficiently: it purifies and corrects the character of the ground.

9. The opinion prevails in some districts, that persons may become milk-sick, without having used either milk or meat of an animal affected with Trembles; and even the physicians in the neighborhood of Owensborough assert, that milk-sickness is nothing else than a miasmatic fever, and call it congestive fever, or bilious puking.

They seem to have become convinced from the symptoms, attending milk-sickness that the disease cannot be any other than a miasmatic one, and they are perfectly right in this matter; milk-sickness being the offspring of Trembles, must of course have some of the blood of its sire; and we know, from all circumstances combined, that miasma produces Trembles. But those who assert, that milk-sickness may attack a person that has not made use of the milk or flesh of an animal laboring under

Trembles, are most assuredly mistaken. Upon closer observation, they will not fail to become convinced of their error.

10. There are various kinds of malaria; according to the circumstances, under which it was formed, it possesses qualities of one kind or of another. Thus it is, that malaria in one part of the country originates yellow fever, and in another intermittent fever.

Again; one kind of malaria has the power to exercise its noxious influence upon several species of animals, another affects only one species or may be two of them, while another kind still affects man only, or animals only, or may be both of them. We know, beyond a cavil or doubt, that each one of the contagious miasmas, possesses peculiar qualities, for,

The one produces Yellow fever;

The second Congestive fever;

The third Intermittent fever;

The fourth Small Pox, &c. &c.;

and, among animals, we see miasma alternately produce Pettis boum, Febres ataxo adynamica, Variolæ, Vaccinæ, Tutoriæ, &c. &c.

In the present state of our knowledge, it would be absurd, for any one to assert that this difference of diseases depends merely on peculiarity of constitution or predisposition of individuals, and not on some essential and specific modification of the miasma. I say now, without fear of successful contradiction, that, from local circumstances existing in Trembles districts, the miasma there receives an additional and specific quality, by means of which it generates Trembles, when perhaps but a short distance from such a spot, the miasma is lacking this peculiar quality, and therefore produces some other miasmatic disease. Again; this contagious miasma sometimes

affects only those animals, which are predisposed to receive it; but when it is developed abundantly, it seizes all the cattle, horses and sheep that come within its reach. Mules, on account of the smaller degree of susceptibility, are more rarely affected with Trembles. The same contagium may also produce different diseases in different individuals or in different species; thus it is, that several epidemics may prevail at the same place and time. From all this it will be seen, that the position assumed by Dr. Seaton, when he says, that no Trembles occur in those places, where miasmatic diseases prevail, and vice versa, proves nothing: for the definition of malaria teaches us, that the miasmatic diseases of men, and the Trembles of animals are entirely independant and different from each other; and that the malaria of the one is not capable of producing the same disease as that generated by the other.

#### CHAPTER VIII.

By analogy we have become convinced that Trembles are an epizootic malady; and by comparing their symptoms with those of joint murrain, or blood murrain, according to Dr Dietrich's excellent work, we have proved that Trembles belong to the Anthrax family; we have further given ample proof, that Trembles are caused, neither by a vegetable nor a mineral poison, but on the contrary by epizootic or miasmatic impurities, and therefore leave this portion of our task, with the assurance that it will not be long, before all, that are interested in this matter,

cheerfully agree, that our opinion is based upon truth and fact. Before I progress any further, I will here say a few words about the manner in which my theory of Trembles has to be tested. The Legislatures of several states, in which Trembles or milk-sickness prevails, have offered certain sums as a reward to the man, who would discover the cause of the disease, and convince the committee, charged with this matter, that the cause he alleges, and no other, can produce this disease. It has been a general opinion, that Trembles and milk-sickness are originated by a specific vegetable or mineral poison; thus it comes, that a great many persons believe, that if the true cause were found out, the disease might at a moment's warning be called into existence by the discoverer; and in this they thought, consists the proof of the correctness of a theory. But such is not the case: malaria cannot be bottled up and administered by us in doses agreeably to our pleasures. There are two different ways, by which to test the truth of any given theory; the one is positive, the other is negative. Suppose there are four silver dollars placed before you, and you are told that there is one among them which is counterfeit. There are two different manners by which you may discover which one is the counterfeit. The positive would be to resort to chemical analysis; the negative, to examine one after another carefully. Compare them with one that you know to be genuine and if by so doing you have convinced yourself, that three of them are genuine, you would not dare to doubt, that the one remaining, is the counterfeit.

Either one of the tests, it will be perceived, cannot fail to lead to the discovery of the object searched for. I have already given negative proof, and the plan of prevention which I am now going to give will be the positive proof.

## CHAPTER IX.

IN some of the preceding chapters, it has already been observed, that it is easier and safer to avoid epidemic diseases than to cure them.

The plan of prevention, which I am now going to lay before the reader, will no doubt prove efficacious; and I hope that every farmer, who has been visited by so unwelcome a guest as Tremble, will at once adopt it, and thus guard the avenues of his premises against a repetition of his visits.

Dr. Drake says, in vol. iv. No. v. p. 370 of the Western Medical Journal, that, when the cause of Trembles is discovered, the axe and plough will prove to be the only means by which the progress of the disease can be stopped.

This assertion is based upon experience; but we know, from the statement of Mr. Walker Hawes and others, that the axe alone is sufficient to arrest the Trembles in a short time. However, farmers would do well to proceed as follows:

*First.* All the trees that can be dispensed with, ought to be cut down and burned; so as to prevent their decaying in the place, and thus produce noxious malaria.

*Second.* Others that are wanted ought to be deadened.

*Third.* The buckeye, burr-oak, black-walnut, and maples ought to be cut down, principally, because their leaves do more damage than those of others.

*Fourth.* In low and marshy places, all the trees without distinction ought to be cut down and burnt or deadened.

*Fifth.* In dry weather, fire ought to be set to the leaves and wood lying about in the forest.

*Sixth.* Dead animals ought to be buried immediately, and not suffered to impregnate the air with putrefaction, or to be eaten by hogs and dogs.

*Seventh.* Farmers ought to salt their stock every day regularly; for the salt cools, dissolves, and opens their bowels, and thus frequently removes the causes of some diseases.

*Eighth.* In districts where Trembles prevail, and during the sickly season, the milk-cow ought to be kept in a fenced lot, in which the timber has partly been deadened or cut down.

*Ninth.* The springs ought to be kept clean, and an outlet for the water ought to be made: this will prevent the water from overflowing the ground in the vicinity of the spring.

*Tenth.* Ponds must be fenced in, or the water drained off, if possible.

*Eleventh.* Animals that are kept up where they cannot procure themselves water, must be watered regularly; and for this purpose a trough is best, set in the place where they are, and filled with good water.

*Twelfth.* During the hot season, animals ought to be bathed; and where this cannot be done, they ought, from time to time, to be sprinkled with fresh water.

*Thirteenth.* Every animal ought, once in a month, to be purged with glauber salts.

*Fourteenth.* Animals must not be suffered to go to places that have recently been overflowed, or where there is a good deal of stagnant water.

*Fifteenth.* When there are meal or honey dews falling, animals must be kept under fence.

*Sixteenth.* Animals ought not to be permitted to lie out during the night, but kept in stables or under fence, from sundown until next morning.

*Seventeenth.* It is of great advantage, if animals, in the hot season, are kept in shady places, and not exposed to the rays of the sun.

*Eighteenth.* Cows ought to be bled at least once every summer.

If farmers will adopt this plan, I feel assured, that, in a short time from now, Trembles will range among the things that were. And, not only will this method of proceeding exercise its beneficial influence upon this disease, but also upon a great many others, with which the people of this country are afflicted.

## CHAPTER X.

ALTHOUGH the preceding chapter has pointed out a method by which the occurrence of Trembles can be prevented, I deem it necessary, before I conclude, to give some directions as to the most efficient treatment of animals affected with this malady. Being well aware, that it will take some time before the farmers are enabled to remove all the causes which are liable to encourage the generation of Trembles, and thereby banish the disease for ever, I flatter myself, in laying before the public a plan of treatment, which my experience has taught me to be the most successful, I shall enhance the usefulness of my work, and thus accomplish the purpose I had in view when I began my present undertaking.

Every farmer ought to procure a large syringe, capable of containing at least one quart of fluid, the tube of which is to be six inches in length.

Furthermore, an instrument for bleeding, and one seton needle.

It is of the greatest importance, that medical assistance ought to be rendered in as short a time after animals have been attacked by the disease as is possible; for upon this depends, in no small degree, the success of the treatment.

A stout and fat animal must be bled to the extent of two gallons as soon as symptoms of the disease have been perceived. Smaller animals of course will not require such extensive blood-letting. After the bleeding, two pounds of glauber salts ought to be given to the large and stout animals, but younger and smaller ones receive a less quantity of this article. The dose is to be repeated six hours afterwards. In the interval, an injection of soap-water and common salt is to be administered every half hour. If glauber salts is not to be had, poke root may be used as a substitute. An ounce of the root is generally sufficient to move the bowels. It is cut into very fine slices and mixed with a roasted apple. The person administering the remedy, pulls the tongue of the animal with one hand, and with the other he introduces the mixture as far back into the mouth as he can, and by letting

the tongue go loose quickly, the animal is forced to swallow.

If the disease occurs during hot weather, the washing with cold water is very useful. The great object however is, to open the bowels freely. Diseased animals ought to be fed on clover, grass, and freely watered: corn, oats and hay they ought not to receive until entirely recovered.

A rowel of six inches long must be applied to the anterior portion of the chest. If 24 hours after the operation, the parts surrounding the rowel begin to swell, it may be considered as an indication that the animal will recover: if the bowels are moved freely, there is no longer any doubt as to the success of the treatment. However, the green food is to be continued for about eight days longer; and, in addition to this, the administration of linseed-oil from time to time will assist the convalescence of the animal considerably. But if, twenty-four hours after the operation, no swelling takes place, and the bowels have not been moved, the injections are to be administered once every quarter of an hour; and one pound of glauber salts every two hours. If, notwithstanding all this, the bowels cannot be made to act, the patient generally dies in a short time. If a relapse of the disease occurs, the same treatment has to be renewed.

If an animal, after recovering from this disease, remains for some time weak, and shows but little appetite, the administration of wormwood, angelica, and gentian root is recommended. Of these latter remedies a small quantity may be mixed with the food three times daily.

The rowel ought to be taken off, and frequently washed with fresh water, to heal it. I may add, that, after the bowels have been moved, the exhibition of muriatic or sulphuric acid has, in many instances, been attended with very desirable results.

These remedies may be administered eight to ten times a day, in doses of one ounce, diluted in one quart of water. Wherever these remedies have been used, they have been found so efficient, that I would advise farmers, living in Trembles districts, to keep them constantly on hand.



