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AMERICAN VETERINARY REVIEW.

NOVEMBER, 1903.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, Sept. 15, 1903.

In my last chronicle I wrote about the great loss sustained by the death of Prof. Nocard, and in so doing I endeavored to record the concise history of the professional life of one who occupied the well-deserved highest rank that had ever been reached by any veterinarian. I spoke of the sad ceremony of the funeral, etc., but how much more could I not have said, had the space required been available. At this late hour yet I must be brief, but must write a few words more.

The general scientific press, the veterinary journals all over the world, have had in their obituary articles but words of praise for our great friend, and it is well for Prof. Leclainche to make the veterinary world acquainted with all that is said of Edmond Nocard; and I thank him for the information that I find in the *Revue Generale* of September 1.

A great and lasting proof of admiration is already given to the memory of Nocard by the authorities of the town where he was born. One of the avenues of that town is to be named after him, and will be known as "Boulevard Edmond Nocard"; and, besides this, a commemorative plate is to be placed on the house where he was born, with the date of his birth (January 29, 1850).

To us Americans, this public manner of appreciation of the great work of a man has, I believe, seldom been resorted to, and,

yet, there are many names in America which might in this way be transmitted to posterity.

But there is one way by which I trust American veterinarians will express their admiration for the work of Nocard. It is this: There is no doubt that the profession of France will erect a statue to the memory of him who has had as many friends as he had admirers. At the time of my writing this, the question has not yet been agitated; but it will, and I think it would be becoming to the veterinarians of the New World to take now the necessary steps to contribute to the funds required for such statue. The REVIEW, I am sure, would be ready to act as an intermediary for this undertaking.

* * *

By the death of Nocard the supporters of the unity of tuberculosis have no doubt lost one of their most powerful advocates; but, nevertheless, Koch's new theory has yet many other opponents, and among them, perhaps, Prof. Arloing occupies the most prominent place. In the *Journal de Zoötechnie* of May last there appeared a paper on the subject from him, which throws an important light on the question and deals a terrible blow to the duality idea.

First stating that some ten years ago everybody seemed to agree on the unity of tuberculosis of mammalia, there were but few exceptions to the generally accepted idea. Then came doubts, resulting from the works of Theobald Smith, R. Gaiser, Frothingham, and Dinwiddie, which were soon followed by the experiments of Koch and Schutz and the announcement of their conclusions that both tuberculoses (that of man and that of animals) were different, because human bacilli, contrary to those of bovine origin, did not affect cattle, no matter by which channel they were introduced into the organism—conclusions which rested, according to the subject selected in the experiments on the *non-inoculability of human tuberculosis to herbivorous animals and to swine.*

At the Congress of London the announcement made by Koch, as our friends know, was far from receiving much ap-

plause. At the seating many authorities came forward to refute the arguments advanced by the great German bacteriologist, and afterwards, when the scientists had returned to their laboratories, many set to work to confirm or to upset the new theory, which, if correct, would upset the great work organized against the disease. Arloing was one of the speakers at the Congress against Koch; he was one of the first to start experiments; he has recently published the result of his observations. He has made quite a number of them, inoculating human tuberculosis to donkeys, goats, cattle, sheep and swine; then bovine tuberculosis to cattle, sheep, goats; and again equine tuberculosis to cattle, sheep, and goats, altogether 46 experiments, viz.: 33 with human and 13 with animal bacilli.

The description of those experiments, the results obtained, the explanations of the reasons Koch's were different, all are clearly presented by the learned director of the Lyon School, and the conclusions arrived at are down to the point in question. They are as follows:

"(1) Human tuberculosis is perfectly inoculable to cattle, and sometimes, with certain ways of inoculation, it gives rise to lesions having the character of bovine tuberculosis;

"(2) Human tuberculosis has not always the same virulence, and a given bacillus does not manifest its strength with the same degree in herbivora of different species;

"(3) In some cases the human bacillus is as virulent as one of bovine origin; while in others, on the contrary, the virulence is so attenuated that it may seem absent, specially if tested on bovine subjects;

"(4) Human bacilli with attenuated virulence, after intravenous injections, do always give rise, in the lungs at least, to lesions that are visible under the microscope and which sometimes progress rather rapidly toward fibrous degeneration;

"(5) It is then impossible to decide on the unsuccessful result of an inoculation without having made a microscopic study of the lung and of the principal parenchymatous organs;

"(6) The variations in the virulence of the bacilli explain

the facts apparently negative which brought Koch and Schutz to the notion of duality;

"(7) The unity of human and bovine tuberculosis must be accepted, and all prophylactic measures imposed by it, specially as far as the use of milk goes, must be reënforced."

* * *

It would seem that the subject of melanosis has been exhausted and that the literature on it has been completed long ago. Nevertheless, a veterinarian, Mr. Peyronny, has thought that it yet deserves some attention, and to this effect has selected for the subject of a thesis at his examination for the degree of M. D., that of the "Melanosis of the White Horse," which brings out points of interest which are recorded in the *Revue Générale de Medéciné Vétérinaire.*

For the author, melanosis of the white horse is an affection special to this animal, always mild in its appearance and mode of development, rarely and that in exceptional cases becoming malignant, having special characters, and which, although it is very common, is still very imperfectly known. If melanotic tumors, fibromas, simple benignant growths, and sarcomas that develop rapidly, or, again, melanotic carcinomas, etc., have been well studied, the melanosis of the white horse seems to have been neglected, and yet it is a morbid entity perfectly distinct from the other so-called melanotic neoplasms.

The observations were made upon 69 animals—white, or of the various shades and kinds of greys—and *in all* this melanosis has been found, at post-mortem, at the *points of selection*, and where in all *it is constantly present.* These points are: the internal face of the aponeurosis of the rhomboideus muscle, on a level with the anus, in the roof of the pelvic cavity and on the psoas muscles, or, again, in the connective tissue of the retro-masseterine region.

The inner face of the aponeurosis of the rhomboideus muscle is always the seat of the melanotic deposits. At first, careful examination is required to detect it, as it is a simple slight puncta, existing single on one side, or is bilateral and symmet-

rical; gradually this increases, the points become tumors of small size, like a small lentil or a nut, to become again growths weighing 500 or 600 grammes or even 10 kilograms. In these conditions they have invaded not only the rhomboideus, but the great and small dentata and even the muscles of the vertebral grooves and the intercostal muscles.

If in many classical works the disease is always considered as serious, Dr. P. does not accept the severe prognosis which is generally advocated. For him, even with the different degrees which may be observed in proportion with the various conditions of the disease, the great general functions of the organism are very seldom interfered with by its presence, and it is only when the neoplasm has assumed very large dimensions that it may mechanically interfere with the usefulness of the animal. Indeed, melanosis does not shorten life; animals affected with it have lived to old age, 28 years and more. But, of course, in cases of external melanosis, the prognosis becomes more serious when by the discharge of the ulcerated neoplasm the animal has become an object of repulsive disgust.

Can an animal affected with melanosis be used for butchery? Yes, says the Doctor, providing the deposits are small and can be removed. No, if the melanosis is generalized. Of course, in this case the meat would be unsalable. At any rate, white horses sold to butcher always command a lower price because of possible melanosis.

The subject of the topography of the disease, of the microscopic examination, of the lesions, etc., completed the thesis, which received a note of commendation from the examiners.

* * *

Some time ago I received a letter from the States asking for information upon a medical preparation which an agent was trying to introduce on the American veterinary market. It was said to be a French preparation, extensively used among veterinarians here, etc. I have also received a notice from the gentlemen who prepared the drug. But obliged to leave Paris for cause of ill-health, I have not been able to give the subject

the attention it deserves. It will be for my return to the great city.

In the meanwhile, I may say a few words of another preparation which I have heard of; which I saw presented at the *Société Pratique*, and is reported excellent in its qualities, whether used externally or internally.

I have always been very shy of those preparations, cures for everything, from a scratch to an attack of anthrax, but "Tannoform" (that is its name) begins to be so much spoken of; it finds its way into the advertising columns of some veterinary journals, even in our REVIEW, that I looked into the matter, and besides the praisings of a few, I find in the *Progrès Vétérinaire* an article which speaks rather extensively of it, and which I resume in a few lines. It is Mr. P. Bitard who records his experience by saying: "We have only praise for the happy effects obtained with tannoform, used either alone or associated with collodion, vaseline, lard, burnt alum, corrosive sublimate, chloroform, etc., in the treatment of solutions of continuity of all kinds, specially synovial wounds and those with loss of substance. It is essentially a deodorizing agent, having cicatrizing properties of great value, and which never gives bad results." That sounds well, does it not? As proof Mr. Bitard mentions the case of a half-bred Norman mare, which had a deep puncturing wound of the foot, severe lameness, fever, etc. She was operated, the wound washed with sublimate solution, dressed with tannoformed collodion, equal parts, and later with tannoform powder only; rapid recovery. Another in a bull with punctured wound of a fore foot, great lameness, two fistulous tracts, operation, tannoform, recovery in three weeks. A mare has a large laceration in the arm-fold, healed in ten days. A steer, which has a fracture of the horn extending to the frontal sinus; there is great inflammation and suppuration; antiseptic dressing with lysol, then tincture of iodine, and finally tannoform. A slut, operated for enormous tumor of the mammæ, healed in twenty days. A colt, with synovial wound at the anterior extensor of the phalanges, in the fold of the hock, with enormous swelling and excessive lameness. A bull has in front of the

sheath an abscess as big as a man's head. A cow in labor has laceration of the uterine neck and deep abrasions of the vagina. A mare has large wounds of both knees with escape of synovia, etc., etc., all benefitted and rapidly cured by the use of the tannoform.

The internal use has not been sufficiently experimented with to permit Mr. Bitard to be as positive in the results, although he has tried it, and if the effects he has obtained in cases of hæmaturia, of hæmorrhagic cystitis, of chronic enteritis, etc., are encouraging, let us wait to conclude. At any rate, our friends can see by the above that the preparation may after all deserve attention.

* * *

As long as I am on the subject of drugs, let me call the attention of our surgeons to a new method of local anæsthesia, which is spoken of by Dr. E. Foisy, in the *Journal de Medecine*, of Paris, and which I believe of good practical value.

According to the author, the adjunction of a few drops of adrenaline to a solution of cocaine will give a real and lasting anæsthesia. This method is applied principally for the anæsthesia of inflamed tissues. The solution which has given the best results is made of solution of cocaine, 1-200, 10 c.c.; solution of chlorhyd. of adrenaline, 1-1000, 10 drops. This solution can be prepared in advance, sterilized in sealed tubes, or made when wanted, by adding to the 10 grammes of the cocaine solution (1-200) the 10 drops of adrenaline. Thus prepared, the solution can be used all at once or in parts, according to the number, the extent, the depth of the incisions to be made.

This formula, however, can be modified when the solution is to be used, when very great incisions are to be made or large morbid tissue to be removed, such as extraction of tumors, anthrax, adenitis. Then 20 to 25 c.c. of the solution of cocaine are mixed with 13 to 15 drops of adrenaline.

For deep abscesses, amputation of small tumors, this method presents undoubtful advantages to the others.

Let us try it!

Is this true? P. B. is responsible for it in the *Progrès Vétérinaire.*

It is in Holland that the "Automatic Physician" is said to be born. In most of the railroad stations stands the automatic individual, made of zinc, handsomely painted. His body is perforated with so many little slots, having the name of a disease or only of a symptom. You put a penny in the slot, pull a ring and the prescription for the ailment is brought out. Celerity, discretion and cheapness!

But the practice of the automatic fellow is not going to last. The physicians of Holland, the true ones this time, have found the farce injurious and have formed a syndicate to cut short the business of the zinc fellow, who went so far in a few instances to hit right, give sound advice, and cure his patient. They will no doubt succeed. But is it new after all? Our memory may be deficient, but I fancy that some years ago the same trick was done in America. I believe in some show in the West. But there it remained only a joke, and did not need a syndicate of physicians to kill it. A. L.

THE ARMY VETERINARY SERVICE.

Nine months ago, under the suggestion and guidance of Dr. Olof Schwarzkopf, 3d U. S. Cavalry, the REVIEW opened a department for the use of army veterinarians and it was given to them absolutely and without reservation, for the discussion by them of the serious problems which have confronted them for the past twelve or fifteen years. The profession of the country, through the Army Committee of the American Veterinary Medical Association, has worked valiently and unselfishly to better the condition of their brethren in the Army by endeavoring to secure for them better pay and a more dignified and honorable position in the service. Their persistent and strenuous efforts have been an object lesson and an example of pure devotion to a cause, as they deplored the almost menial basis upon which their profession in the Army stood. Their efforts were worthy of more success than they achieved, though their gratuitous

labors were just as creditable to them, and deserving of as much appreciation as though they had been fully successful. Their work, however, was not without good results. The first efforts at moving an imbedded stone are always the most irksome; when once it has been gotten into motion, its momentum can be maintained with half the exertion necessary to start it. Their combined strength gave the first impetus by securing for the army veterinarian the pay and allowances of a second lieutenant of cavalry, and, while the next push failed to send it any further, it is just possible that too much was attempted at that time. Many believe that if, under the favorable circumstances then existing, and with the masterly generalship of Drs. Salmon and Huidekoper, a more modest demand had been made upon Congress, their request would not have incurred the determined opposition of the War Department, without which any reasonable bill would have become a law. A bill asking for modest "rank" would, therefore, in our judgment, have been passed by both houses of Congress and secured the approval of the President. No criticism is aimed at the promotors of that measure; in fact, the REVIEW used what influence it could command to further it, and would do so again. But it feared then, and knows now, that the very audacity of our demands was bound to incur the disapproval of the head of the Department of War. Nothing daunted, the profession is just as willing to undergo the same labor to help our colleagues and our profession in the Army; but we are more sober now, and we know that our demands must be modest if we hope for success. We will get what we can now, and when the times are again propitious, we will take in a little more "slack," and thus keep on "hitching" until we reach the point which we should occupy in the Army of the United States.

The position of the army veterinarian is much better today than it was five years ago, particularly when there is a fair prospect of a dignifying commission. If this were not true, there would not be the really large number of recent graduates seeking admission to the service, in times when the Govern-

ment is clamoring for just such men in the Bureau of Animal Industry; when States are importuning our colleges to send them young men of qualification to fill really desirable positions upon boards of health and live-stock sanitary commissions; when private practice is more alluring than it ever was, guaranteeing handsome incomes for capacity and energy. The life of an army veterinarian is apparently attractive to them, and we have much faith in the ultimate success of the effort now being made to elevate the service, because we know that the character of the new acquisitions will not rest content until they have secured it. Whether it is to be a second lieutenancy of cavalry at first, to be followed later on by something better, we know not; but that the army veterinarian will become a commissioned officer, with all the advantages conferred by such rank, we are sure. How long this will be delayed depends largely upon the veterinarians occupying the army positions now.

Dr. Schwarzkopf has, we think, simplified the question very much in his communication in the October REVIEW; he has divested it of all mystifying superfluities, and looked it squarely in the face; he has undeceived those who clamor for high rank and who put forth but little effort to secure it, or even the humblest improvement upon present conditions; he has appealed to his colleagues to unite in a reasonable memorial to the War Department, and has shown the futility of all efforts where this power is ignored. The REVIEW is still willing to give its pages freely for the preparation of the plans to accomplish this.

What are the army veterinarians going to do about it? Have they completed their discussion of their plan of action? Are they preparing their memorial or round robin to the War Department? Is Dr. Schwarzkopf being supported in his laudable undertaking as he deserves? The REVIEW does not know. It only hopes the subject inaugurated with so much spirit in the March number will not be allowed to lapse into a state of "innocuous desuetude," and hereafter to hear the army veterinarian complain of this condition.

PROSPERITY FOR THE VETERINARIAN.

Every sign points not only to the continued prosperity of the veterinarian, but to an increase in the demand for his services. In every field that has opened up to him in the past quarter of a century, each one of which he has filled with consummate ability and dignity, he is firmly entrenched, and his value is recognized to greater degree as familiarity with his intrinsic worth extends. Private practice has always been the magnet which attracted the most recruits to our ranks. This field, however, has in recent years been menaced by mechanical innovations, but more seriously, perhaps, by rumors of threatened innovations, which have had their effect in breaking that enthusiasm which is essential to material progress in any profession or calling. It chills the ardor and blunts the ambition of those within and deters the better class of those without in embracing the study of veterinary science as a life-work. A young man, equipped with a good classical education, looking over the field for a calling upon which to bestow his energies and abilities, must have in the beginning as an incentive an abiding faith in the permanency of his selection, as well as good prospects of its expansion. When rumors continuously greet him that the foundation of his chosen calling is liable to be destroyed through its extinction as a prominent factor in human activity, he cannot enter upon the task of perfecting himself with any degree of confidence and enthusiasm.

It appears to us that anyone who can read between the lines, or who can see through the mist that has been obscuring our horizon, that our chief patient is secure from molestation and will remain the most useful and best beloved servant and companion of man for all time.

His latest rival, the automobile, has been with us sufficiently long to demonstrate its qualities and the place which it is destined to fill as a means of pleasure and of practical and profitable utility. For the former purpose it has proven a unique and popular diversion—a fad which has not yet run its course, and which will for some time to come continue to endanger the lives

of drivers and pedestrians and to offend their olfactory sense. As an adjunct to the transportation outfit of business establishments it is closing its career with a celerity rather unexpected. One after another of the large business houses of our cities which adopted the automobile in the hope of improving their delivery facilities, have dropped it, after much vexatious and expensive effort, thoroughly convinced that it is "unreliable, prohibitively expensive, and altogether a nuisance" (to use the expression of one firm which gave them a long trial and lost over $35,000 in doing so).

It may, in our judgment, then, be not seriously considered as a rival of the horse for practical utility or for lasting and genuine pleasure, and we are left to contemplate the fact that the veterinarian's sphere as a ministrator to the permanent occupant of the field of local individual transportation, aside from the other and numerous capacities of the educated veterinarian in the realm of sanitary medicine, is as secure as is the estate of man.

But the public will no longer tolerate with complacency, incompetency or anything short of the highest accomplishments in the veterinarian of the future. Veterinary science must give that public scientists, men of character and capacity, and it behooves us to prepare ourselves for this certain demand. Our national association, as the leader in all professional progress, and our colleges, which have ever shown the greatest loyalty in following its lead, can be relied upon to supply this demand.

ST. LOUIS IN 1904.

The Executive Committee of the American Veterinary Medical Association have promptly decided upon the Exposition City for its forty-first annual convention. There are very many reasons why the choice is a good one: First, its central location is beyond criticism, and will bring out the largest number of veterinarians ever gathered together in this country; second, the Louisiana Purchase Exposition being in full blast at that time, will make the trip to the meeting doubly pleasant and

profitable; and, third, the National Organization, never having met within the boundaries of that commonwealth, which has furnished its membership roll with many of its best men, owes it to them to thus recognize their strength and loyalty.

The Association having adopted an amendment to its by-laws at Ottawa, advancing the time of its meeting one week, the dates of the meeting will be August 16, 17, 18, and 19, 1904.

THROUGH the courtesy of Dr. W. L. Williams, we present our readers, and particularly those who were so fortunate as to have been present at the last meeting of the New York State Veterinary Medical Society, with a brief account of the cases presented at the clinic held in connection with the meeting. The greatest value of such a report resides in the results obtained from the surgical demonstrations, and we purposely withheld detailed allusion to them until results could be stated in conjunction with the list of operations.

OUR practical readers should not overlook the prize competition announced by Dr. Wm. Dougherty in the October REVIEW for a short essay on the forging horse. The conditions are stated in his letter, the time limit being December 1. The first paper, already received, will appear in the December number, to be followed by others in as quick succession as possible. We trust there will be many competitors, as the condition is interesting, while our literature is especially silent upon the etiological factors.

HORSES WORTH $1,000,000,000.—For the first time since 1892 the value of the horse stock of the United States is now estimated at more than $1,000,000,000. Notwithstanding the fact that bicycles, automobiles and electric street railways have come into the field in the last few years, there are more horses than ever before and they are worth more money. The exact figures, vouched for by the Secretary of Agriculture, are:—16,557,373 horses, valued at $1,030,705,959.

ORIGINAL ARTICLES.

"TALLIANINE."

THE FIBRIN-FERMENT CONTENT OF THE BLOOD *IS* PROPORTIONAL TO ITS RICHNESS IN LEUCOCYTES.

By Drs. H. Stassano and F. Billon,

Physiological Laboratory of the Sorbonne.

Extract from the Transactions of the Biological Society of France, April 25th, 1903.

While the rôle of the leucocytes in the coagulation of blood is indisputable, it is nevertheless only vaguely known, and for this reason we have investigated the question as to whether there exists any ratio between the number of leucocytes circulating in the blood at the moment of blood-letting and the content in fibrin-ferment of the escaping blood.

This research is decidedly a difficult one if the animals used be small. The prolonged struggling, the narcotics or anæsthetics used, the repeated blood-lettings on the same animal, all these exercise, as a matter of fact, no inconsiderable effect upon leucocytosis. These disturbing influences, however, may be avoided by taking large animals as the subjects of experiment, and this plan we followed out, using as a rule only cows which weighed over 1100 pounds.

In order to induce variations in the number of leucocytes circulating in the blood, we made use of a new product, "Tallianine," which *provokes, when injected intravenously, an abundant leucocytosis*, an effect which is very rapid in small animals, but slower in the horse or cow. In the note appended to the present communication, we give a few illustrations of the effect exercised by "Tallianine" upon the leucocytes. (See "Studies upon Leucocytosis," appended.)

The blood used for our leucocyte counts was in each case withdrawn direct from the jugular by means of a hollow needle. In estimating the content of the blood in fibrin-ferment, we used

the process described by Mr. Arthus, although in some cases we found it of greater advantage to use a reagent composed of a mixture of ascitic fluid with fluorised blood-plasma.

Regarding the coagulating power of the blood, we made in a preliminary series of experiments comparative observations upon the plasma obtained by centrifugation of the samples of blood we desired to compare. These samples were made incoagulable by the addition of fluoride of sodium in similar proportions and at the end of the same period (15 minutes) after the exit of the blood from the vessels. In a second series of experiments we used the plasma produced by the spontaneous coagulation of various samples of blood. In order to compare the changes in the coagulating power of the blood with the variations in the number of leucocytes, we prepared test-tubes, each containing the same quantity of reagent (2 cubic centimetres of fluorised plasma or of the mixture of ascitic fluid with fluorised serum); then with these tubes we set up as many parallel series (each series consisting of six tubes) as there were blood-sera to be compared. In each of these series the quantities of blood-sera added to the reagent were respectively 2 drops, 1 drop, $\frac{7}{10}$, $\frac{5}{10}$, $\frac{3}{10}$ and $\frac{1}{10}$ of a drop. These tubes were thereupon either left at laboratory temperature, or placed in the incubator at 99° F., and the coagula which formed were compared. The clearest results were obtained when the comparisons were made about 18 hours after the beginning of the experiment in the case of the tubes left at room temperature, and five to six hours for those kept in the incubator.

We experimented first with two cows. The blood of the first contained at the beginning of the experiment 4,250 leucocytes in the cubic millimetre; the blood of the second, 8,750. Seven hours after the injection of "Tallianine," the blood of the first cow showed 9,250 leucocytes and the blood of the second, 21,500.

The series of tubes exposed to the action of the fluorised plasma of the first cow and the serum of the second, demonstrated clearly that the blood withdrawn at the beginning of the

experiment contained much less fibrin-ferment than that obtained during the hyperleucocytosis. In other words, the size of the coagula thrown down by the addition of the blood taken at the beginning of the experiment was always correspondingly smaller than the size of the coagula precipitated by the blood belonging to the period of hyperleucocytosis. Thus it seems clear that an increase of the coagulating power of the blood runs parallel with an increase in the number of leucocytes. The proof becomes even more definite if, instead of comparing the size of the respective coagula, we compare the tubes with respect to the point of time at which the coagula form. We then find that in the tubes belonging to the period of hyperleucocytosis the coagula develop several hours ahead of those representing the beginning of the experiment (the reagent being ¼ fluorised plasma with ¾ ascitic fluid).

In a third series of experiments upon a heifer, in which hyperleucocytosis was induced by bleeding, we were able to demonstrate again the same parallelism between the number of leucocytes and the fibrin-ferment content of the blood. In this animal, weighing about 600 pounds, we drew off first two litres of blood from the jugular, and the leucocytes rose from 12,000 to 13,500 in the cubic millimetre. After a second bleeding of five litres, the number went up to 20,750, and remained at that figure for some time, even after a third bleeding of three litres. The coagulating power of the blood withdrawn we found to be each time correspondingly increased.

On the other hand, the increase in the fibrin-ferment content of the blood resulting from the hyperleucocytosis induced by the injection can hardly be attributed to the direct action of the product injected, for, as a matter of fact, we were able to demonstrate in a series of control experiments, that blood withdrawn two hours after the injection (when the number of leucocytes was as yet increased only 1250 in the cubic millimetre) possessed a coagulating power scarcely, if at all, greater than that shown by the blood withdrawn at the beginning of the experiment. Further than this we ascertain that the coagulating

power of the blood returns to the normal when the hyperleucocytosis disappears.

We believe, therefore, that we are justified in concluding that the content of the blood in fibrin-ferment is in direct ratio with its richness in leucocytes.

* * *

STUDIES UPON LEUCOCYTOSIS.

NOTE BY DRS. H. STASSANO AND F. BILLON.

The product mentioned in the preceding article as having been used by us in the experiment described to induce an increase in the number of leucocytes was one which has been introduced into veterinary therapeutics by Doctors Pichard and Cotty. It is obtained by the action of ozone upon a terpene-bearing volatile oil, the action being arrested at a point when the latter has absorbed a quantity corresponding to four volumes of ozone. This product was kindly furnished us by Messrs. Brigonnet Pére & Fils & Gaubert, who manufacture it for commercial use at La Plaine St. Denis, under the name of "Tallianine."

The product is entirely harmless. We have injected it intravenously in massive doses without noticing the least subsequent disturbance. *Its most marked characteristic, physiologically—the one which in all probability will account, at least in part, for its curative properties—is to rapidly increase the number of leucocytes in the circulating blood.* In the rabbit, it causes in a short time an intense, but fleeting leucocytosis. The following observation copied from our records seems to us to be a very typical example of this form of leucocytosis in small animals.

January 18th, 1902.—Rabbit, weighing two kilogrammes, given 2 cubic centimetres of "Tallianine" in the vein of the ear.

In large animals the product induces the leucocytic action more slowly. The following observation is an example:

March 31st, 1902.—Ten cubic centimetres of "Tallianine" were injected into the jugular of an old horse.

Time of Examination.	Number of Leucocytes in the Cubic Millimetre of Blood.
Before the injection	13,500
20 minutes after	9,750
40 " "	45,750
1 hour after	37,500
1 hour and 20 minutes after.	38,750
2 hours and 20 minutes after	20,000
2 " " 40 " "	12,250
3 " after.	11,250

Time of Examination.	Number of Leucocytes per Cubic Millimetre.
Before injection	5,250
15 minutes after	6,500
45 " "	7,250
1 hour and 40 minutes after.	8,000
2 hours " 10 " "	9,500
5 " " 30 " "	5,000

The following observation, the subject of experiment in this case being a heifer, is a much better demonstration of the degree of leucocytosis induced in large animals by the product with which this communication is concerned, viz., "Tallianine."

Time of Examination.	Number of Leucocytes per Cubic Millimetre.
Before the injection	12,750
5 minutes after	9,000
30 " "	12,250
1 hour after.	14,500
1 hour and 30 minutes after	14,000
2 hours after	20,250
2 hours and 30 minutes after	18,750
3 " " 30 " "	17,500
4 " " 30 " "	18,500
5 " " 30 " "	21,750
6 " " 30 " "	19,250
7 " " 30 " "	19,000
10 after	24,500
11 " "	25,000
12 "	23,000
13 "	18,750
30 "	14,250
52 "	12,500

November 16th, 1902.—The animal, weighing over 600 pounds, received by the jugular vein 300 cubic centimetres of "Tallianine," the injection being made in eight minutes.

There exists a certain ratio between the amount of the product injected and the degree of the hyperleucocytosis induced. The proof thereof will be seen if one compares the results of the preceding observation with those of the following double observation. We possess, besides, in our books of records, other observations which prove the existence of this ratio as a fact.

December 17th, 1902.—Two cows, one, weighing about 1200 pounds, received by intravenous injections 50 cubic centimetres of "Tallianine"; the other, weighing about 1150 pounds, received 20 cubic centimetres "Tallianine."

Time of Examination.	Number of Leucocytes per Cubic Millimetre.	
	1st Cow 50 c. cs. "Tallianine"	2d Cow 20 c. cs. "Tallianine."
Before the injection, and a bleeding of 200 cubic centimetres in each cow	8,750	4,250
Five minutes after the bleeding.	12,500	6,750
Injections of "Tallianine" given:		
2 hours after the injection	10,000	5,000
4 " " " "	12,250	5,500
6 " " " "	13,500	5,500
7 " " " "	21,500	9,250
9 " " " "	8,250	6,750

The hyperleucocytosis, of which the above are a few examples, concerns, both in small and large animals, the polynuclears. In the majority of cases the increase reaches as high as the third of the normal ratio between these leucocytes (the polynuclears) and the mononuclears.

CORRECTIONS.—Dr. J. S. Butler, Secretary Minnesota State Veterinary Medical Association, writes under date of Oct. 6, as follows: "On page 554 of the September REVIEW, under head of Maladie du Coit, by Dr. Foster, instead of 1250 animals inspected, it should read 730 inspected; 79 destroyed should read 65 destroyed; 194 castrated, should read 114 colts and stallions castrated."

ECHINACEA IN VETERINARY PRACTICE.

By P. A. Fish, M. D., M. D. V., Ithaca, N. Y.

A Paper read before the 13th Annual Meeting of the New York State Veterinary Medical Society, at Ithaca, Sept. 15-16, 1903.

Echinacea angustifolia, De Candolle, is an herbaceous plant, the root of which sends up from year to year a slender, but sometimes a rather stout, stem, two or three feet in height, bristling with hairs. It is an indigenous plant growing chiefly in the Western States, from Illinois to Nebraska, and southward through Missouri to Texas, thriving best in rich prairie soil. It is abundant in Kansas. The generic term, *Echinos*, meaning hedgehog or sea urchin, refers to the spiny, hedgehog-like fruiting head; while the specific name angustifolia originates from the Latin words *angustus* (narrow) and *folium* (leaf), contrasting this species from the other forms of echinacea. It is quite distinct from *Echinacea purpurea*, Moench, which is a taller plant with wider leaves, growing in the Eastern States from Pennsylvania west. *Echinacea angustifolia* is the narrow-leaved variety and blooms from June to August. It belongs to the natural order compositæ and the root is the part used in medicine.

Synonyms.—Purple cone flower, cone flower, nigger-head, black sampson, the latter term also being employed for *E. purpurea.*

History.—Dr. H. F. C. Meyer, of Pawnee City, Nebraska, (1870), seems to have been the first among physicians to have used echinacea as a medicine. He used it in a secret mixture with wormwood and hops, and called it "Meyer's Blood Purifier." Among his claims for it was its antidotal action upon the poison of various insects, and particularly that of the rattlesnake. Dr. Meyer stated that he even allowed a rattler to bite him, after which he bathed the parts with some of the tincture, took a dram of it internally, and laid down and slept, and upon awakening all traces of swelling had disappeared. In 1885 and 1886 he sent specimens of the plant to Mr. C. G. Lloyd, who

identified it as *Echinacea angustifolia* of De Candolle. In 1886 Dr. Meyer communicated to the late Professor John King his uses of the drug as he had employed it for the preceding sixteen years. Among other things, success for his remedy was claimed in boils, internal abscesses, ulcerated sore throat, old ulcers, nasal and pharyngeal catarrh, various fevers, trichinosis, acne, eczema, and also colic in horses. Later use of the drug has to some extent substantiated many of the almost incredible claims of the introducer; for the conditions for which it was recommended might well be due to vitiation or dyscrasia of the blood, the very field in which echinacea has been found to be most useful.

Professor King took an active interest in the drug and after extensive experiments became convinced that it possessed great merit. It is due to Professor King more than anyone else, perhaps, that the drug became generally used among the eclectic and other practitioners.

It is said that much of the root collected has little medicinal value. The root collected in the marshes and lowlands east of the Mississippi is of this negative quality. The best quality is obtained from the prairie lands of Nebraska. Professor Lloyd's experience is that few drugs vary more in quality than crude echinacea. The root, if of good quality, when chewed, gives at first a sweetish taste, later becoming acrid and pungent, and finally leaving a persistent tingling sensation, followed by a peculiar numbness of the tongue and fauces, apparently intermediate in character between that produced by aconite and cocaine.

Chemical Composition.—According to the investigations of Professor Lloyd, the plant contains minute quantities of an alkaloid, which is devoid of color, and unimportant so far as its medicinal qualities are concerned. In his earlier investigations he failed to find the alkaloid. He finds that "the characteristic principles of the root are those substances linked to an acid organic body of a resinous character, nearly, if not quite colorless, and possessing, in an exalted degree, the persistently acrid

qualities of echinacea—so intensely that it is distressing to the taste, even in very small amount, when pure. The stinging sensation affects the tip of the tongue for hours. But small quantities of it are present, even in the best root—less than ½ to 1 per cent."

The writer, experimenting upon some tablets of the powdered extract of echinacea, was unable to find any evidence of the presence of an alkaloid, glucoside or neutral principle, but did find a resin of which about 70% was soluble in ether.

Preparations.—Fluid extract, tincture, and echafolta. According to Professor Lloyd, the best menstruum for the fluid extract and tincture is alcohol 4 parts and water 1 part. Both preparations mix well with water, and there is no very appreciable precipitation. Echafolta is described as a purified preparation of echinacea, free from coloring matters and extraneous substances, such as chlorophyll, extractive, and other "plant dirt." Another preparation put out by Battle & Co., of St. Louis, is known as Ecthol, and is said to contain the active principles of Echinacea and Thuja.

Dosage.—Echinacea is comparatively non-toxic. In human medicine the dose of the fluid extract and tincture is given at ¼ to 1 drachm; echafolta 4 to 8 minims every one to four hours. In veterinary practice the writer has used the powdered root in doses ranging from 2 to 8 drachms for horses and cows.

Physiologic Action.—The action of the drug upon the mouth has been variously described as resembling aconite, pyrethrum and xanthoxylum. The tingling sensation persists for some little time, even after the throat has been gargled. The flow of saliva is promoted. According to Ellingwood, diaphoresis soon occurs and a continuation of the remedy stimulates the kidneys to increased action. "All of the glandular organs seem to feel the stimulating influence and their functional activity is increased. The stomach is improved in its function, the appetite increases, the food is more perfectly digested, the bowels operate better, and absorption, assimilation and general nutrition are materially improved. It encourages secretion and excre-

tion, preventing further auto-intoxication, and quickly correcting the influence in the system of any that has occurred. It stimulates retrograde metabolism, or tissue waste more markedly than any other single remedy known. It influences the entire lymphatic system. Anæmic conditions improve with increased nerve tone." Professor Webster recommends it as a stimulant to the capillary circulation.

The writer has confirmed upon himself the eliminative action of echinacea with respect to urea. Determinations were made upon the afternoon urine for six days, and the average amount of urea obtained for this period. A dose, of 5 grains of the powdered extract of echinacea in tablet form, was then taken three times a day before meals for six days and urea determinations taken as before. The following cut is introduced for the purpose of comparing the two series of determinations. The lower curve represents the period when the drug was not taken ; the upper is the echinacea curve.

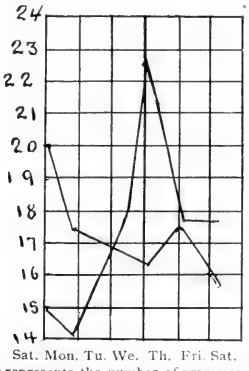


FIG. 1. The lower tracing represents the number of grammes of urea per 1000 c.c. of urine for each of the six days when the echinacea was not taken (Normal curve). The upper tracing represents similar condition when echinacea was taken.

The results showed that during the use of the echinacea there was an average increase of 2.83 grammes of urea per 1000 c.c. of afternoon urine, per day.

Some experiments were also tried upon kittens to determine

the toxicity of the drug, the fluid extract of echinacea and the preparation known as echafolta being used. Kittens weighing 2 and 2½ pounds were employed; one being dosed with two drachms of the fluid extract in six drachms of water; the other with two drachms of echafolta in six drachms of water. (The equivalent dose for a horse weighing 1000 pounds would be nearly 1 gallon of the drug). Within five minutes there was incoördination of movement and within twenty minutes both cats were unable to walk. There was some dilatation of the pupils during the early stages. After forty minutes emesis occurred, in the kitten which had received the fluid extract, and after this had occurred improvement took place, although lack of coördination persisted for some time. The following day this kitten was apparently as normal as ever. Emesis did not occur in the kitten receiving echafolta; she soon became quiet and lay upon her side as if asleep, but with her eyes open. The conjunctiva was less sensitive than normal and the pupils were somewhat contracted, but would still respond to light stimulus, although slowly. The appearances suggested a condition of profound narcosis or stupor, all of this occurring within two hours. The kitten remained in this condition all of the following day; but on the third day was found to be in her normal condition again.

Later the experiments were repeated under the same conditions, except that three drachms of each of the preparations were administered. The general symptoms were as before. On the second day the heart and respiration were much depressed, the body cold and the pupils contracted. The pulse fell to 56 and 58; respirations 10 and 12 and the temperature fell to 70.8 in one kitten and 71.8 in the other. The kitten receiving the fluid extract (there was no emesis this time) died toward the close of the second day. The kitten receiving the echafolta was found dead and in rigor on the morning of the third day. The post mortems showed no marked changes aside from some congestion of the lungs, and the stomachs moderately distended with gas, some liquid, food and mucus were also found in the stomachs.

The suspicion arose that the effects above described might be due to the alcoholic menstrua in which the drugs were dissolved. Further experiments were therefore tried. The alcohol was driven off by evaporation until an extract of echafolta was obtained which was five times more concentrated than the normal drug. One drachm of this concentrated extract was mixed with 15 c.c. of distilled water and 5 c.c. of alcohol, and administered to a kitten as in the previous experiments. Compared with the first experiment, this kitten received 2½ times more of the echafolta, but with the alcohol driven off. There was apparently no effect during the 2½ hours she was under observation. The experiment was repeated upon a second kitten with similar results.

In another experiment, the alcohol was driven from the fluid extract of echinacea, until the resulting extract represented a concentration three times greater than the original fluid extract. Two drachms of this concentrated extract, mixed with 20 c. c. of water and 5 c.c. of alcohol, were administered to a kitten as in the case of echafolta; within ten minutes the kitten became uneasy and emesis occurred; four minutes later there was profuse salivation. An hour later the kitten was apparently normal again. In another experiment four drachms of the concentrated echinacea were administered in the usual way. Profuse salivation soon occurred and there were spasmodic movements of the body suggestive of attempts at vomiting. Within twelve minutes emesis took place and after this had occurred improvement set in and the kitten soon returned to its normal condition.

In still another experiment, one drachm of the powdered extract of echinacea, in tablet form, was mixed with four drachms of normal saline solution. This was divided into two portions and injected subcutaneously at four-minute intervals. Four minutes after the last injection, emesis occurred; no untoward symptoms occurred; the kitten continued to purr, but was not so playful as before. Three days later it was observed that abscesses were forming at the places of injection; in a day or two the abscesses broke and some sloughing of the tissues occurred.

Some days later the kitten was found dead, probably from infection. It should be stated that antiseptic precautions, in making the injections, were purposely omitted, as it is claimed by some that the drug possesses antiseptic properties. The result would indicate that the drug, without its alcoholic menstruum, has no inhibiting action upon the growth of bacteria.

To complete the observations, it remained to note the effects of alcohol and compare them with those produced by echinacea and echafolta. Three drachms of 95% alcohol diluted in water were administered to a kitten. Within ten minutes she showed signs of staggering. Incoördination of movement was not so marked and did not appear so promptly as when the drugs were used. She could still walk, but with difficulty, one hour later. The pupils varied in their condition, sometimes being contracted and at others dilated. The next day the cat was very much improved and soon recovered.

It should be pointed out that a three-drachm dose of the alcohol did not prove fatal, whereas the same dosage of either of the drug preparations caused the death of the animals on the second or third day. The narcotic effects were not so quickly produced nor so profound with the alcohol as with the drugs. The absence of effects from the drugs when deprived of their alcoholic menstrua may be explained by the fact that the drugs were practically insoluble in water and were therefore very slow in being absorbed; whereas, in the alcoholic menstruum, the drug was readily and quickly absorbed, so the whole bulk of the drug quickly entered the system and produced pronounced effects. With the drug in its insoluble form it entered the system so slowly and in such small amount that the effects were not noticeable.

Echinacea in tablet form, crushed and suspended in water and administered to frogs in proportionately large doses, produced quick narcotic effects from which the frog gradually recovered.

Human Therapeutics.—As a therapeutic agent echinacea or echafolta can be used internally and externally at the same time.

It is difficult to classify the drug under a single title. Some have referred to it as an alterative and as an antiseptic. The eclectic practitioners seem to agree in referring to it as a "corrector of the depravation of the body fluids."

It has been highly praised as a remedy for blood poisoning and changes manifested by a disturbed equilibrium of the body fluids, resulting in various tissue alterations exhibited as boils, carbuncles, abscesses, or cellular glandular inflammations.

It has been recommended for fevers resulting from the absorption of septic material, such as typhoid, puerperal, septicæmia, etc. It is regarded as a highly important remedy in uremic poisoning, diphtheria, various ulcerated and catarrhal conditions. Intestinal antisepsis, and aphrodisiac properties, when locally applied, are claimed for it. Satisfactory reports of its use have been given in appendicitis, erysipelas, spinal meningitis, cancerous growths, syphilis, tetanus, bites of poisonous animals and insects. The Sioux Indians have been reported as using the fresh root scraped and given freely for the bite of the rattlesnake with recovery in from two to twelve hours. Statements more difficult to accept are those in connection with rabies. It is said that in five or six cases, animals bitten at the same time as the patient, had developed rabies, and had even conveyed it to other animals, and yet the patient showed no evidence of poisoning, if the remedy was used at once. It is said that one case exhibited the developing symptoms of hydrophobia before the drug was used and that they shortly disappeared after treatment.

Veterinary Therapeutics.—Except for the reference, in the early part of this paper, to the use of echinacea for colic in horses, the drug has not been used in veterinary medicine, so far as the writer knows. The following cases seemed to be of the character for which the use of the drug was indicated, and it was therefore employed.

Case 1.—A small brown calf, weighing about seventy pounds, was brought to the clinic on account of loss of appetite, unthriftiness, and a peculiar grunt at the end of each expiration. Con-

stipation was marked ; some of the symptoms pointed toward impaction of the rumen, and there was some suspicion of pulmonary complications. For the first few days the calf did not improve. The constipation was quite resistant to treatment, although purgatives were administered at each end of the animal. Some echinacea was administered from the first. When the bowels were opened, echinacea in half-drachm doses, was the only treatment employed. The kidneys became active again (no urine had been observed for two or three days) ; the appetite became vigorous ; the expiratory grunt disappeared ; urination and defecation occurred freely, and the animal made an uneventful but satisfactory recovery. It is not unlikely that some auto-intoxication had occurred from the prolonged constipation with some respiratory complication.

Case 2.—A gelding, seven years old, weighing about 900 pounds, was brought to the clinic suffering from strangles. Pulse 48, temperature 104.4. A flaxseed poultice was applied to the intermaxillary swelling ; this was opened on the third day and about one-half ounce of pus escaped. One-drachm doses of powdered echinacea were administered from the outset, without other treatment. Within a week the pulse had fallen to 40 and the temperature to 100. The horse was discharged and no subsequent symptons appeared.

Case 3.—A Jersey cow suffering from fistulous withers. This cow had received treatment two months previously, and after four or five weeks had been sent home. Two weeks later she was returned, the fistula having broken out again, and her condition was such that it was thought best to give no further treatment, but to use her as a subject for dissection. While waiting for the dissection, the echinacea treatment was begun experimentally. Some necrotic tissue was removed from the tip of the scapula, and the fistula washed out daily with a solution consisting of one part of echafolta to twelve parts of water, and frequently some of the powdered echinacea was dusted over the wound. Internally two-drachm doses were given morning and night with the feed. A few days later the doses were raised to

one-half ounce, then to one ounce and for a short time she received two ounces at a single dose. The doses then dropped to one-half ounce until she was discharged cured. Upon inquiry, it was found that there was no recurrence of the trouble two or three months after her discharge. General improvement was noted soon after the treatment was inaugurated; her appetite increased and she began to put on flesh and there was general improvement in tone and vigor.

Case 4.—This case was reported to me by Dr. T. S. Childs, of Saratoga Springs, who used the drug in several cases of catarrhal fever "with more or less good results." The cases, however, were serious, and as the remedy was new and experimental he abandoned it in favor of his regular treatment. He writes, however, that he had one very bad case of the fever in which the echinacea was used throughout, with stimulants, and that it made a good recovery in a very short time.

Case 5.—Dr. J. B. McNeil, of Ballston Springs, writes me that he used echinacea in six cases of influenza and one case of purpura hæmorrhagica, the latter case being well advanced with some tissue disintegration. He gave one-drachm doses of echinacea every five hours and one-ounce doses of turpentine every six hours. He states that all of the cases made rapid recoveries, more especially the case of purpura hæmorrhagica, which he considered hopeless when he took it in charge.

Summary.—From the writer's observations it would appear that echinacea, in therapeutic doses, is a valuable agent for the elimination of morbid material from the system; that it exerts a beneficial effect upon the nutrition of the system, possibly through its eliminating action upon the waste material, thus causing a demand on the part of the tissues for new and better nourishment, as evidenced by a stimulated appetite. Its action may, in some respects, resemble that of an alterative in that it seems to stimulate and improve the body fluids, probably through the capillary and lymphatic circulations. While in some cases the effects may be reasonably prompt, in others the changes may be gradual and a long course of treatment be required.

Echinacea, while sometimes producing rapid and brilliant results, may, in other instances, be found wanting. Its variability in quality and its use for conditions in which it is not indicated may account for some of its failures. It would seem, however, from the evidence at hand, that with conservative use and due regard to failure as well as success, that echinacea should be a valuable addition to veterinary therapeutics.

At the Chicago Horse Show, which was held the last week in October, Dr. M. H. McKillip acted as chief surgeon, with Drs. Frank Allen, Geo. E. McEvers, and Gerald E. Griffin as assistants.

Veterinary Inspection at St. Louis Exposition.—(1.) The Louisiana Purchase Exposition will appoint a veterinary surgeon for the Department of Live Stock, and such assistants as may be necessary. (2.) All animals before admission to the Exposition grounds will be examined and must pass a satisfactory veterinary inspection, as a safeguard against infectious or contagious diseases. (3.) The veterinary surgeon of the Department shall make daily inspection of the grounds, stables, stalls and pens and make each morning a report in writing to the Chief of the Department concerning the health of animals on exhibition, the condition of the grounds, stables, stalls and pens, and any other matters pertaining to the sanitary condition of the Department. (4.) Exhibitors will promptly report in writing to the Chief of the Department and the veterinary surgeon any symptom of disease in their respective exhibits. (5.) In case of the sickness or injury of any animal while on exhibition it shall be removed upon the order of the Chief of the Department from the Exposition grounds, or to a separate enclosure, where the exhibitor may direct the treatment of the animal. (6.) If the veterinary surgeon of the Department of Live Stock, or another, is employed to treat a sick or injured animal the exhibitor shall pay such veterinary surgeon a reasonable charge for his services, and other necessary expenses incurred. (7.) In case of doubt or protest as to the age of an animal in competition an examination shall be made by the veterinary surgeon, and should his report be that the age has not been correctly stated, or should any evidence submitted as to the animal's age be found unsatisfactory, said animal shall be barred from competition.—(*From the Official Rules and Regulations.*)

TREATMENT OF COUGHS IN DOGS AND HORSES.

By D. E. Buckingham, V. M. D., Washington, D. C.

In the practice of veterinary medicine there is often met a condition which produces cough without any other prominent symptom than the cough itself. In the spring and fall when coats are changing on both horses and dogs the weather is variable and sudden changes are the rule. Chilling of the body surface produces a congestion of the internal organs, and especially the bronchial membranes, which have so much to do with the warming of the inspired air.

These membranes are doubly susceptible, both on account of the internal congestion following the contraction by cold of the entire capillary circulation of the skin, and in the second place by local contact with the air. It would appear on first thought that the same agency of cold would contract and relieve the congestion of the mucous membranes, but functional activity overcomes such an anæmia, and we have a double congestion which is characterized by a dry cough in horses and a hacking cough in the dog, both of which are paroxysmal, and due to specific causes.

Exercise and increased lung activity incite this cough. It is noticed on starting from the stable and when the cold fresh air enters the trachea and lungs in increased volume. Dogs called from their kennels or sleeping places after a short bark of pleasure begin with a most distressing cough, rapidly repeated, and ending shortly in a retch and hack which brings up a little bit of phlegm, insignificant in amount, when compared to the exertion of bringing it to the surface. The scanty secretion never seems to loosen. The above is not a picture of the same cough in the horse. He cannot vomit or spit.

Such cases are hard to treat successfully, and not until I began prescribing Glyco-Heroin (Smith) have I had the kind of success which satisfies me. It goes without saying that these cases must be treated, first, by opening the primæ viæ with castor oil or saline cathartic. The first is preferable, as it will

have a more soothing effect on the larynx and tracheal membrane if in administering it should wander from the foodpath.

A number of coughing dogs and horses are being presented at my hospital for treatment, and the out-patient practice also includes similar cases, all of which are being treated with Glyco-Heroin, as it gives better results than any other combination of medicines we have heretofore used.

The cases herein cited are of special interest.

Case No. 1.—October 5 I was called to see Mrs. H.'s Black Hawk Morgan roadster "Star," in fine condition, with a heavy coat. He was suffering with a severe "cold" and high fever, accompanied by a deep cough, which pained him whenever it occurred. Temperature $105\frac{4}{5}^{\circ}$, respiration 37, pulse full and strong; diagnosis, acute catarrhal inflammation of the bronchial tubes. The patient was ordered upon hot bran mash, extra blankets, and leg bandages. Fever medicine was prescribed as follows:

℞	Quiniæ sulph.,	℥ i
	Acid sulphuric (dil.) q. s.,	
	Tr. aconiti.,	f ℥ i
	Tr. belladonnæ,	f ℥ iij
	Spts. ether, nit., q. s.,	f ℥ viij

M. Sig:—℥ ss t. i. d. in a little water.

One-half-ounce doses of Glyco-Heroin (Smith) were given every four hours for the distressing cough. The sequence of such cases is generally prolonged, persistency of the cough lasting for a week or ten days even after convalescence. I was surprised to note that when the horse's temperature was normal, as it was in about six days, his cough had also left him.

In this case the cough was very painful even when the mucus was excessive, and it is this bronchorrhœa that generally prolongs the convalescence.

Case No. 2.—A week later, and in the same stable, the coach horse "Peacock," a nervous active horse, just over his acclimation process after having been shipped from Buffalo, revealed a cough without any other sign of disease. This cough was the outcome of an acute bronchitis probably due to microbic infection from his stable mate "Star." One-ounce doses of Glyco-Heroin (Smith) were given t. i. d. Hot bran mashes, blankets and bandages were ordered and in less than five days my patient was free of cough and ready for work. Such results I have seldom been able to attain with the ordinary run of treatment.

Case No. 3.—The three-year-old collie dog "Prince" during his shedding time was presented at my hospital for treatment. He was distressed with a dry hacking cough which ended in the spitting of a little frothy mucus. The paroxysm of coughing was brought on by exercise, barking, or any slight exertion and there was an extreme irritability of the bronchial membrane. The patient was given a two-ounce dose castor oil and

Ammonii chlor., ʒ ij
Glyco-Heroin (Smith), fʒ ij
M. Sig :— ʒ ss t. i. d.

In two days there was a marked change. Expectoration began, irritability was soothed, the cough changed in character and left the animal in about a week's time. This was a typical case of its kind. House dogs at shedding time are sent to this hospital in large numbers for the treatment of this form of dry bronchitis. All of them have a hard, dry cough which is made eight or ten times and ceases when a very small amount of phlegm is raised. If the stomach is full the retching ends in a vomit. My line of treatment is now a safe and sure one, as indicated above.

Case No. 4.—Mrs. Tyson's bull terrier puppy was exposed in a place where a distemper case had been, and on October 12 I was called to her house to see the dog. The vesicles of distemper had appeared on the abdomen and some had ruptured. The puppy was eating well, and showed but little sign of depression except a teasing laryngeal cough, which occurs so often in this disease and in pneumonia. It is simply a quick spasmodic expulsion of breath without the sound of coughing like "hah," which continues a long time if patient is aroused and kept from sleep. This irritability, which is no doubt due to the action of the specific organism of canine distemper and its toxine, on the peripheral ending of the recurrent laryngeal and bronchial nerves, is overcome in part by Glyco-Heroin (Smith) when combined with some preparation of quinine to inhibit the action of the bacillus of distemper.

The following was prescribed :

Syr. quiniæ (tasteless), fʒ i
Glyco-Heroin (Smith), fʒ iij
Sig. ʒ ss every four hours.

This is a sheet-anchor treatment and can be depended on to relieve cough, favor expectoration, and induce sleep in the rest-

less nervous form of distemper. In the above prescription there is a slight dietetic value in the syrup and glycerine which is worth considering in puppies of a few pounds weight. I have met several cases of late which respond nicely to this treatment when properly protected from the cold night air and other influences which so often operate against the very best efforts of the veterinarian. The puppy under treatment recovered with but a slight mucous cough.

In passing, I would warn young practitioners when considering drugs to be used as calmatives in cough, that morphine should not be considered in dogs and weak patients, as its bad after-effect and emetic action on the stomach does more harm than good. For a long time I have been in search of a drug that would do the sedative work of morphine minus its bad effects. Codein is too mild to depend on in acute cases, while heroin shows itself to be stronger and surer. Given a case of dry, spasmodic cough caused by asthma in an old house dog, if we use comp. syr. pinus alb. and add a little too much morphine to produce quiet sleep, the whole dose is apt to be ejected and our efforts to relieve are frustrated, unless we use the hypodermic syringe.

Case No. 5.—Tan terrier Gyp, eight years old, just beginning to show asthmatic breathing and cough, was brought to my hospital. The acute bronchitis which complicated her asthma was caused by incessant cough. This kept her invalid mistress awake at nights and as the lady and dog were inseparable and the former an invalid, it was very important to stop the cough. I prescribed

Glyco-Heroin (Smith), f℥i
Sig:—Twenty drops every two hours.

She showed marked improvement after two doses and the first night slept better than she had for weeks. This improvement was maintained, and though a cure is out of the question, and the owners of such dogs refuse to kill them, it is necessary to keep these cases under drug influence as night approaches; and Glyco-Heroin (Smith) does the work better than anything I have ever tried.

Case No. 6.—In another and almost similar condition in an

old fox terrier I used the following with marked abatement of the symptoms, which were chronic :

Potass. iodide, ʒ ij
Glyco-Heroin (Smith), fʒ ij
M. Sig :— ʒ ss every three or four hours.

The potash salt acts remarkably well for awhile and should always be tried in long standing cases.

When the heart is feeble, as it often is in asthma, I use

Tr. digitalis, fʒ iss
Glyco-Heroin (Smith), q. s., fʒ i
M. Sig :— ʒ ss every four hours.

Case 7.—Mrs. Thombs, of Massachusetts Avenue, sent for me to see her sixteen-year-old fox terrier suffering with a most severe paroxysmal cough I have ever heard in a dog. Not more than ten minutes rest to the hour. She was so fat her skin was tight and shining in places. A great ruff of fat circled her neck, throat, and chest regions.

The mistress gave a history of feeding three times a day and plenty of it. Cough had been on about two weeks, but judging from similar cases I suppose it had been present in a slight degree for many months. She barked every time the door-bell rang and this brought on a coughing spell.

Without going into discussion of the pathology of asthma, suffice it to say, that the theory of fat infiltration into the bronchial tubes fits this case, hence I ordered her to my hospital where dieting and fasting could be carried out to perfection. A practice which is always impossible at home. I gave her a large dose of Glyco-Heroin (Smith) and the clinical report showed that she slept all night and coughed but seldom. Her generally restive spirit in the daytime was quieted and the characteristic propping of the body with fore legs and fear of lying down were both overcome by a pleasant soothing sleep.

The last three cases represent a constantly recurring class of dog patients which the city veterinarian is called upon to relieve, and though his efforts to cure are nil, yet he is required by kind, indulgent owners to persist in his efforts to palliate the disease. The old, fat, house dog, fed on candy and starched desserts, cream and the whole menu of the family table, has his death knell sounded by such feeding. Killed by kindness, like a horse with azoturia. Fox terriers, pugs and cocker spaniels are the breeds oftenest seen thus afflicted.

Case No. 8.—I was called to see the seven-year-old collie in good condition, but showing the first signs of bronchial constriction common to this age. He was suffering with an acute laryngitis and had been following the carriage during a cold snap, had cooled off by lying under the porte-cochere in a blizzard wind. A slight fever, rapid pulse and a strong desire to cough, were prominent symptoms. Patient sits on haunches and keeps chest propped up with fore legs, head well extended. I prescribed full dose of castor oil and Glyco-Heroin (Smith) in drachm doses, every four hours. This is a heavy dosage, but my patients are often rebellious to small repeated doses. I think it best not to aggravate them. Upon my visit next day, cough and chest symptoms had abated, the dog had slept considerably and the owner was well pleased. I ordered the medicine to be given three times a day, when upon my next visit the cough had left entirely and I discharged my patient.

It is taught by physiologists that there is reason and purpose in a cough; that it is reflex action following a stimulation of the peripheral nerve endings in the respiratory tract. This set of nerves may be irritated by a collection of mucus, by a simple congestion, by blood from hæmorrhage, by foreign substances and by respiratory air coming in contact with hypersensitive nerves. Each one of these causes is frequently noticed in daily practice. I believe in letting alone the simple mucus cough and that caused by hæmorrhage and apply my efforts to assisting nature.

The cases afore-mentioned are typical of a large number, and show the positive results of Glyco-Heroin (Smith).

Dogs bear relatively larger doses than their master, man. I give them enough to produce sleep, as it rests and relieves the patient, and every hour of freedom from cough is a step nearer recovery.

Horses often require as large a dosage as one ounce every two hours when there is an acute invasion of disease or a relapse in convalescence.

At the recent Orange County (N. Y.) Horse Show, Drs. R. W. A. English, J. H. Schoonmaker, and J. F. De Vine were the inspecting veterinarians.

STATE BOARDS OF VETERINARY EXAMINERS.

THEIR RELATIONS TO THE TEACHING SCHOOLS, THE PROFESSION AND THE STATE.

By Thos. B. Rogers, D. V. S., and Wm. Herbert Lowe, D. V. S., of New Jersey.

Read at the Annual Meeting of the Veterinary Medical Association of New Jersey, at Trenton, January 8, 1903.

The establishment of State Boards of Examiners is a legitimate outcome of the growth of veterinary medicine, marking a period of its evolution. A passing glance at this growth will not be out of place. Veterinary medicine in the United States may well be said to have had its origin in Dr. Liautard's school in New York. The need of skilled veterinarians—a need only in part filled by foreign graduates settling in our country—was seen to be pressing, and the success of the early graduates of the New York school led rapidly to the establishment of veterinary schools and veterinary chairs in agricultural schools in many parts of the country.

The early schools were two-session schools, the sessions being about five months in length, and the teaching in some of them was very good indeed for the times. Soon, however, a number of schools sprang up, organized for gain or the professional aggrandisement of the teaching staff.

With the establishment of Harvard and the University of Pennsylvania schools, a new era was inaugurated. Three sessions and thorough instruction, with laboratory work of high grade, was their requirement for graduation, and their superiority over the best of the two-session schools became manifest. However, as the diploma of the poorest of the two-session schools was just as valuable as that of the high grade three-session schools, as far as conferring the right to practice was concerned, a result that might have been predicted followed; the students desiring an education took three sessions at a good school, those who desired but a "sheepskin," flocked to the two session diploma mill. All the general public asked was whether

the practitioner had a diploma, and a certificate purchased from the now defunct Philadelphia Veterinary College went about as far as a diploma from "Fair Harvard" with the general public. The inevitable result was large graduating classes from the diploma mills and small ones from the good schools. Even the good schools have had their troubles. A most mistaken parsimony on the part of those in authority decreed that the veterinary laborer in their vineyard was not worthy of his hire; that the receipt of a few hundred dollars per annum and the privilege of advertising himself as a "professor" was ample compensation for his devotion to science; that he must emulate the Edinburg reviewers in cultivating literature on a little oatmeal; indeed, that plain living and high thinking was good for him.

The result may be seen on the bulletin board of the school —"Professor Bones will not meet his class to-morrow," means that Bones, lucky dog, has secured a little private practice and that to-morrow he is going to attend to it, and so keep the wolf away from the Bones family door.

We don't blame Bones, but how about the class? Lacking the establishment of schools unhampered by questions of ways and means, the position of our best teaching schools has been a most unenviable one. Their teachers desired to do right, were anxious to further the higher veterinary education as far as in them lay, but the competition of the poor schools was too strong. A Western establishment advertises a class numbering nearly two hundred. Harvard has shut up shop. Under present conditions help cannot come from within, and it seems to the writers that the only salvation for the good schools is to be found in properly conducted State Boards of Examiners. In New Jersey we were in a bad way. New York and Pennsylvania had stringent State examination laws, and as we had none, it is only fair to presume—but we will leave it to your imagination.

What, then, may be hoped for from the establishment of these boards? What will be the effect on the teaching schools?

It will make them adopt a three years course. It will com-

pel them so to teach as to ensure their graduates a fair chance when they take the State examinations. Indeed, this much has been already accomplished.

Far more than this may, however, be hoped for if the State Boards, possessing the confidence of our legislators and BACKED BY A UNITED PROFESSION, are able to do their full duty.

It may be said with entire fairness, that the superior schools of to-day teach too much ; the poor schools too little. The latter will inevitably go to the wall under the law of the survival of the fittest, and so may be left out of account ; the thinly plastered teaching of the more pretentious, requires some consideration at our hands. How far is it possible in three sessions of eight months, reduced by holidays, examinations, missed lectures on the part of teachers, and missed recitations on the part of students to about twenty-one months of actual work—to teach anatomy, chemistry, physiology, biology, histology, horse shoeing, botany, pharmacy, materia medica, theory and practice of medicine and surgery, obstetrics, pathology, canine practice, toxicology, veterinary jurisprudence, meat and milk inspection, bacteriology, zoötechnics and therapeutics with any degree of thoroughness ? Plainly, it cannot be done in a manner acceptable either to conscientious teachers or their pupils. Would it not be better to teach less and teach a few subjects more thoroughly ?

There is a growing opposition to the further lengthening of the curriculum in any scientific or classical course so much so that the handwriting on the wall is unmistakable. The writers believe that they stand for the higher veterinary education as strenuously as any, indeed the skilled veterinarian must, like Francis Bacon, take all knowledge to be his province ; our contention is that he cannot take all the rudiments and *digest* them in twenty-one months. The result of the process is usually an attack of scientific dyspepsia from which the sufferer recovers tardily or not at all.

It is our opinion that this condition of affairs can be improved if the State Boards insist on a very thorough knowledge

of essentials. Another question arises in this connection—that of a period of pupilage prior to the college course. Really, it should be impossible for a difference of opinion to occur on this point. There is a *science* and *art* of veterinary medicine and it does seem as though no one in this day should claim that the best way to become an artizan is to listen to lectures and read books. As Huxley well says: "If a boy wants to learn the tea trade, we don't set him to read up botanical descriptions of the tea plant and books about China; we apprentice him where he can learn about tea practically, where he can smell, taste and handle it; any other course would result in his speedy bankruptcy."

No doubt all of us have felt the lack of much practical knowledge—knowledge of the very highest importance considered in its influence on our success during our early years of practice—only to be gained by doing things for ourselves and doing them repeatedly, and unfortunately it is just these things, the ability to handle animals, to give a ball, cast and tie up a horse, pass a catheter neatly, put a sling under a rampant horse, take off or put on a shoe, etc., by which we are judged by our clients and in which most of us are deficient during our early years of practice. We trust that this association will seriously consider this question of pupilage.

Another argument in favor of pupilage is that it would keep out of the profession many men who are entirely unfitted for it and who at present do not discover this absolute unfitness until they have wasted much time and money. A year or two of hard work with a practitioner would surely enable this class of men to see that their life work lay in other directions than in the practice of veterinary medicine.

The question of how to eliminate any part of the present college curriculum is a more difficult matter. What shall be left out or required as a condition for matriculation? It does seem, however, that there are certain subjects that could well be placed in a class by themselves, and that a knowledge of where to look to find information about them should be required rather than a parrot vocabulary of *words* regarding them. For example, you

may lecture until you are worn out to some men on the external conformation of the horse, but unless they have the eye you might as well fill the hour by talking about calico. Or, again, unless veterinary jurisprudence is taught by a very exceptional man, its consideration had better be divided between the chairs of pathology, chemistry, and therapeutics and a few well considered lectures, supported by cases from decisions of the courts on what does or does not constitute soundness.

The relations of State Boards to the State are, we think, very simple. The State in substance says, Give us men we can use in our business of controlling contagion and enforcing sanitary police regulations; and give us men who will not by their inefficient equipment cause unnecessary losses to stock owners and so diminish our taxables, and we don't care what school they come from, how long they stayed there, or what they did when they were there. We hope it is clear to all of you that it is not a function of the State either to practice veterinary medicine through its employés, to endorse particular methods or particular schools, or in any way to interfere with the freedom of the people to treat their stock as they please, provided their methods are not in contravention of the common or statute law. It is no part of the State's business to form a veterinary trust, though perhaps in these days of trusts they might allow the incorporation of one were the fees paid.

What are the relations of the State Boards to the profession? They certainly are not to be regarded as close corporations intent on keeping the number of practitioners at a minimum by means of too severe examinations. If twenty men present themselves to-morrow and answer the questions put to them, it is no concern of the State Board that their admission may crowd the profession in certain places; they must be given certificates to practice. It is the duty of the Board to take cognizance of infractions of the law, but these cases must be supported on sufficient evidence to secure a conviction. It is idle for a veterinarian to make an informal complaint and then kick because the Board didn't do something the kicker couldn't do himself.

It is the duty of the Board to keep the profession informed as to what schools best qualify their pupils for the examination, so they can intelligently advise intending students as to what school will afford them the best opportunities of study.

It is the duty of the Board to so demean themselves as to raise the standard of appreciation of the veterinarian among the law-makers and people of our State; and on the other hand we think it is the duty of the profession to give to the Board their hearty support and encouragement. We are doing this work under difficulties not altogether understood or appreciated, and we believe that we are doing it with only these purposes in view —to perform our sworn duty to our State and to elevate by every means which our position confers on us our beloved profession.

A REMARKABLE DISEASE.—Visitor at army stables in Arlington to old colored veterinarian: "Well, Pompey, what diseases are your horses troubled with most frequently?" "Well, sah, dee mostly I hab ter tek ulsters out ob deh feet, sah."—(*Lippincott's Magazine.*)

ABANDONS THE AUTOMOBILE.—The large firm of Saks & Company, of Herald Square, New York, who began business a little over a year ago, on a large scale with every up-to-date equipment, ignored the horse altogether in their delivery department, substituting the handsomest and latest automobiles. After using them for one year, they have been forced to give them up on account of "unsatisfactory service." The element of expense did not influence them, although it is said that each machine cost four times as much as a pair of horses to maintain. According to the New York *Herald* of Oct. 4, the firm has placed an order in Twenty-fourth Street for thirty high-acting delivery horses. - - - - A physician, who has just abandoned the automobile for horses, after four-years' vain trial, says each machine he has had (and he has purchased four) cost him from $1000 to $1200 a year to run it. - - - - Another physician, who owns a little electric runabout for "hurry" and night calls, using horses on his regular route, says it is costing him $700 a year for charging and breakage. From these and many other reports it would appear that the verdict up to the present is that they are both unsatisfactory and prohibitorily expensive for business purposes.

THE USES AND ABUSES OF CATHARTICS.

By R. L. Tucker, D. V. S., Providence, R. I.

Read before the First Annual Meeting of the Rhode Island Veterinary Medical Association, 1903.

Mr. President and Gentlemen:

I can assure you it is with extreme pleasure that I stand before you this afternoon with this paper in my hand, to be the first one to present a subject to you for your earnest discussion; and I hope you will listen with earnest appreciation and bear in mind, fellow-graduates, that this is the beginning, practically, of our foundation of the building that we surely are erecting—that is, the edifice of advancement of veterinary science in Rhode Island.

The subject in question is one that, in my opinion, is of great importance—"The Uses and Abuses of Cathartics."

The meaning of the word cathartic is, according to my interpretation of the term, any substance entering the animal economy, and by its absorption or by the irritation caused thereby, increases the alvine evacuations. Some, of course, act on different parts of the system, such as calomel and colocynth on the anterior part of the intestinal canal, and aloes on the small bowel, and the salines on the whole.

Now, gentlemen, this is simply a short preamble to what we are going to discuss. Of course, it is an understood fact between us all that we know when, and when not to use these medicines, but is it not wise for us to discuss between ourselves whether or not we do really know? For instance, we are called to see a so-called case of colic. The instant we see the animal, there runs a mass of symptoms through our minds that have coursed there so many times, ending up at the same old goal (colic); but is it a simple case or the misnomer, for, as you know that the term "colic" does not mean simply a group of abdominal symptoms producing pain therein, but it is a disease itself, just as much as enteritis or pneumonia are diseases. It is, gentlemen, an *itis* of the mucous membrane lining the

colon, and should be termed "colitis." But I am digressing a little.

One of the first things we jump for is one of the many anodynes placed at our command, and as a rule it is immediately followed by a large dose of aloes, or oil, or a combination. I have done it myself, but is this good treatment? Have we put ourselves to the necessary trouble of taking the temperature of our patient? Or have we examined the pulse to enlighten ourselves as to its condition? If we knew this was not quite as it should be, should we give a dose of aloes, to still depress it more? Here, gentlemen, is where lots of us make mistakes; we do not intelligently inquire into the merits of our patient. We must remember that the intestine of the horse covers a superficies of more than 4200 square inches, or about 90 square feet. This extent of intestine is covered by a highly vascular mucous membrane, filled with actively secreting glands and abundantly supplied with nerves. Such an immense extent of vascular mucous membrane necessitates great caution in the administration of cathartics to the horse, and we are taught by our instructors, as well as by our own knowledge, brought about by our study of the parts, that an animal should be prepared at least a day previous to this administration, and that the dose should be moderate; and still, in the face of all this knowledge and instruction, we daringly step up and administer a cathartic of from 6 to 12 drachms of aloes, or from 1 to 2 quarts of oil, and before even ascertaining the history of the case. Now, gentlemen, do you think this good treatment? We all know that there are cases of enteritis that start in very much like the so-called simple colics. They are, in fact, very much alike in aspect, and still we, without making a thorough examination, administer a cathartic, and in a few hours our patient does not improve, but grows boisterously worse, and we may at this time find him with a quickened pulse, high temperature, and we say within ourselves, "I wish that those 12 drachms of aloes were on the outside."

Then, too, there are cases of peritonitis in the dog, when the

animal has been exposed to dampness, or very cold baths. We immediately administer a cathartic on our first visit, and, like our old grandmothers of the past, say "If we can only get his bowels to move he will be all right." But we really mean that the medicine prescribed will give us a little longer time to make our diagnosis.

I have seen cases of acute pleurisy that at first sight I thought were colic, but, gentlemen, the moment I took the pulse and temperature, I looked further into the matter, which search taught me that pleurisy in its acute stages was not to be treated by a large cathartic dose of medicine.

On the other hand, how often are we called to use cathartics in cases of extreme plethora, when the owner thinks that the animal needs a cathartic to reduce his flesh? I saw a case some months back, where a veterinarian was called to see a horse that was 20 years old or more, not eating well, and he gave 10 drachms of aloes, with, of course, the physiological result, superpurgation and death. Now, this is against all rules and practice of veterinary science. It is the old fogy treatment of years ago. In other words, it is the method of the old "cow doctor."

There is also a custom very common among some of our local veterinarians of going to a drug store and having an aloetic mass made up with vaseline or some other such vehicle or base and carrying it with them, and at times, when they think a cathartic is necessary, they pick up a quantity of this semi-solid mass, a pill is made, and he is ignorant as to what amount he has administered. Here is room for damages on the plea of maltreatment, if any trouble should arise.

Do we ever stop and think over the physiological structure of our intestinal canal, and consider the therapeutic action of these powerful cathartics on its mucous surfaces? I was talking some time ago to one of our profession, and during the conversation the drug eserine was mentioned, and his statement was that he very seldom used it, only in cases of impaction. Now, this physician must have made a mistake; he really did not

mean to imply that he would give a dose of physostigma in cases where one of the intestines was full of fæcal matter. Remember, fellow surgeons, that this drug does not act, as most cathartics do, by irritating the intestinal mucous membrane, but by a nervous action, produced by stimulating the pneumogastric and eccentric nerves of the canal, thereby causing a blood pressure on them, and not only on them, but on the other organs controlled by this great nerve—the lungs, which is accountable for the extreme accelerated respiration we witness in cases where this drug is administered.

There is one other purgative medicine of which I wish to speak here, and which is often used as a last resort, especially in those cases which we call "coprostasis" or "straw colics," and that is chloride of barium. Here is a drug, the knowledge of which is very meagre, especially from a physiological standpoint. What is chloride of barium? It is a salt, either sulphate or chloride, made by subjecting the barium salt with muriatic or sulphuric acid; and is unfit for use on the animal economy. It is used principally among dyers and for photography, and is a deadly poison when entering the blood, as it is a pure and simple tissue destroyer.

There is also one other cathartic in general use among us, and that is the oil of the "bana crotoni," or croton bean. This one, especially of the drastic class, should be used with extreme caution. We know the escharotic effect it has when applied to the derma, and how much more so must be its action on the intestinal mucous membrane.

Now, gentlemen, we have arrived at a stage when we must look into the drugs that sometimes have a dual action, or, as some of our famous authors on medicine would say, the drugs that at times act directly opposite to their usual mode. We will look at that famous old medicine, the one that is our stronghold, the one that hangs to us as does the love of maternity, the one which is our sheet-anchor in hundreds of cases, which if administered a great many times indiscreetly, can do no harm. That drug is known to us as opium, or that obtained from the pres-

sage of the papaver somniferum, or garden poppy. Did you ever hesitate or stop to think that this great medicine, the sheet-anchor in colics, the high-water mark of enteritis, pleurisy, laryngitis, cystitis, peritonitis, and a dozen other inflammations, may become a cathartic under peculiar existing circumstances? Now, as to what these circumstances may be. For instance, we are called to see an obstinate case of constipation, when apparently all of the antispasmodics and cathartics have failed to relieve and subdue the pain, we are brought face to face with this drug, opium. We do not like to give it, because we are told that it decreases the mucous secretions of the bowel, thereby acting as a check on the alvine secretions, but our animal is suffering intensely, and we dare give the maximum dose, and in a few hours the spasm is relieved, the stricture of the bowel removed. The bowels assume their functional activity; in short, opium has not only acted as an antispasmodic, but as a cathartic indirectly. This is not theory, but results that have taken place in my personal practice.

In conclusion, I will say that I think that the uses of purgative medicines are often brought into abuse. They are often used when our diagnosis is in doubt to procure more time for the obscure symptoms to become more manifest, thereby causing delay during the convalescent stage. In other cases, too large doses are given. If a cathartic is necessary, except in extreme cases, and the animal has been intelligently prepared, from 6 to 8 drachms are quite sufficient. If in the canine part of our practice we made use of some of the simpler cathartics, such as the mercurous mild chloride, podophyllyn, sodii sulphate, I am sure that our patients would be much sooner relieved, as well as not have been submitted to the intestinal disturbances that are consequent upon the administration of the stronger ones.

I have occupied quite a little of your time, and as there will undoubtedly be some time occupied in the discussion of these few remarks, and some of us present have some distance to travel before reaching our homes, I will ask your permission to submit this recital to your friendly discussion.

CLINICAL OBSERVATIONS ON BURSATTEE OR SUMMER SORES.

By L. Van Es, M. D., V. S., Agricultural College, Fargo, N. D.

While engaged in practice in the southern part of Alabama, the writer had occasion to observe numerous cases of the above mentioned disease. It must be admitted, however, that the lesions found were not diagnosed as such until other writers had identified them with the rain-sores of India.

As met with in Alabama the disease is most common in mules, although cases in horses are quite frequent. Bursattee was not met with in other animals, while inoculation experiments in cats, dogs, guinea-pigs and rabbits yielded negative results.

The disease is most common during the warm season of the year and during this period it is most refractive to treatment. Cases are also met with during cold weather, but as far as the observations of the writer go they were all contracted during the summer.

The lesions of bursattee are entirely confined to the skin or mucous membranes and no cases were seen in which muscles or bones were involved. No special region of the skin seemed to be exempt, and where a mucous membrane was affected, it was always at places near the natural orifices.

How the disease is contracted is entirely a matter of speculation. The sores are readily transmitted from animal to animal. The writer has in mind two cases in which a simple wound (wire cut) served as an opening to the bursattee infection. These cases occurred in mules belonging to different stables in which bursattee cases were kept. In one case the infection could be traced to a post, against which the animal was in the habit of rubbing itself and which was quite bloody from the bursattee animal using it for the same purpose; the other case stood next to a mule affected with bursattee and the animals were in the habit of licking and biting one another.

Harness sores and saddle-galls also form a favorite foothold to the infection.

The teeth are the most efficient means, not only of transmitting the disease from animal to animal but also of transplanting the sores from one part of the body to another.

Bursattee sores at first make their appearance as a somewhat thickened, denuded, flat nodule of the skin. The nodule is ill-defined and in many cases is surrounded by an œdematous area; this œdema is of a transitory nature. The epidermis over the nodule becomes thin, smooth, shining and is moistened by a watery exudate. The appearance of the sore is ushered in by intense itching and the patients will make most desperate efforts to bite or rub the affected place.

By atrophic changes and by the biting and rubbing, the epidermis over the affected area soon disappears and a smooth, red, moist sore makes its appearance. The edges of this sore are indurated, while its base is also quite hard. In no case infiltration into the subcutaneous connective tissue was seen. Wherever this tissue be loose the growth is quite movable.

Closer examination will reveal the presence of hard, grayish white bodies, especially near the periphery of the sore. They vary in size from a small millet seed to a large pea and usually can be readily removed from the small cavities in which they are contained. In these cavities the small bodies or kunkurs, as they are called, are surrounded by a clear, thick, tenaceous fluid.

The kunkurs have their origin in the necrosis and subsequent calcification of small tubercle-like nodules, which are characteristic of the disease and consist of small round cells (leucocytes?) and perhaps also of the causative microörganism. The kunkurs and tubercles are placed in a stroma composed of the proliferated connective tissue of the dermis.

From the periphery the sore slowly enlarges as the neighboring skin becomes invaded. In some ulcers the growth ceases before it has reached a considerable size, while in others the area extends until cold weather checks further invasion. The

largest sore seen by the writer measured 9 x 6 inches.

During summer time there is absolutely no tendency towards healing and the sores, which become covered by a new epidermis during cold weather, invariably break down again with the advent of hot weather.

It is especially during hot weather that the greatest difficulties in treatment are encountered.

In the earlier experience of the writer the sores were treated by the common antiseptic methods, but very little was accomplished in that manner. Most cases failed to recover until cold weather brought relief. In other cases caustics were employed regularly, but while some improved or healed, the results as a whole were not satisfactory.

The caustics used at that time were nitrate of silver or corosive sublimate. Later on the necessity of more radical measures became evident and the knife was used whenever this could be done.

Even then, recurrences of the lesions were often observed in the wounds or scars. This, however, was due to imperfect excision. At that time the sore itself was removed and the indurated skin around it was left whenever it did not contain the characteristic concretions.

Frequent recurrence after removal showed that the sore proper must be given a wide berth. All thickened skin must be included in the piece to be removed ; if this is not done, the sore is apt to return. In such cases the edges of the wound increase in thickness, kunkurs soon make their appearance and a second operation becomes necessary.

When the sore was removed from places in which the skin was loose and movable, like on the shoulders, neck or sides, healing, even of very large wounds, took place in a short time and with a minimum of scar tissue.

In regions in which the skin is intimately connected with underlying structures, the process of healing was tedious. This was especially the case when the ulcers were removed from the coronet, fetlock or metacarpal region. In three cases the ob-

servation was made that a wound, from which a sore was removed by a liberal margin, was re-infected by means of the tongue or teeth of the animal.

The writer's observations in that line lead him to believe that the cavity of the mouth harbors the causative agent long after the lesions have been eliminated from the skin.

The after-treatment of the wounds consisted in daily sublimate irrigations and the use of a boracic acid-iodoform or boracic acid-acetanilid dusting powder. In cases in which the healing process was sluggish, a strong solution of chloride of zinc was occasionally used.

In all cases the edges of the wounds must be very closely watched.

Owing to the prejudice of owners against radical measures, it was necessary to use other treatment in quite a few cases. Arsenious acid, sublimate, nitric acid were all given a fair trial, but with a small degree of success. For this reason other remedies were tried and it was found that formaldehyde had a surprisingly good effect in several cases. The remedy was used as the 40% solution of commerce or in a mixture of the latter with equal parts of glycerine.

The action of the chemical is very energetic and should be confined to the sore proper. This is best accomplished by smearing a layer of vaseline for a considerable distance around the place to be cauterized.

The sore should be thoroughly cleaned and freed from all scabs and crusts before the formaldehyde is applied. A bit of absorbent cotton on a glass rod was used to convey the liquid to the sore. The sore is simply moistened with it and left to itself. Within a few hours the surface will be covered by a dense, tough and thick scab. The scab is firmly united with the underlying structures and will usually remain *in situ* for a number of days.

The part should not be disturbed until the scab becomes loose or drops off, when the sore should be carefully examined and in case the edges show any induration whatever they

should receive a second application. The base of the ulcer seldom needs more than one cauterization except in cases of some time standing.

The formaldehyde treatment can be used to advantage in small growths or in cases in which excision is not practicable.

The writer remembers cases in which one application of formaldehyde was sufficient to exterminate small growths, so that by ordinary antiseptic treatment the remaining wound soon healed.

In cases of large sores, and especially when those are situated in regions in which the skin is loose and movable, the removal with the knife will yield the more prompt results.

On prophylaxis little can be said in the absence of a more full information on the etiology of the disease. It may, however, be well to keep affected animals to themselves, so that they cannot contaminate stables by rubbing their ulcers on walls, door-posts, etc. Some attention should also be paid to the harness, as it is very apt to convey infection.

Especial attention should be paid to the fact that the disease can be easily conveyed by the mouth. An infected animal will keep his oral cavity constantly supplied with infective material by means of licking or gnawing the ulcers, and any abrasion made by the teeth will form an excellent entrance-point for the organism, whether it be on the body of the animal itself or in others.

INTERSTATE ASSOCIATION OF LIVE STOCK SANITARY BOARDS.—At the annual meeting of this association, which took place at Denver, Col., Sept. 22-24, the following papers were read by veterinarians: "Cattle Mange or Scabies," Dr. J. C. Norton, of Arizona; "Anthrax," Dr. Leonard Pearson, Pennsylvania; "Glanders," Dr. C. P. Lovejoy, Illinois; "Foot-and-Mouth Disease," Dr. Austin Peters, Massachusetts; "Sheep Scab," Dr. Chas. G. Lamb, Colorado, and "Breeding and Immunizing Hogs from Cholera," Dr. A. T. Peters, Nebraska. Dr. J. C. Norton was elected President. Dr. D. F. Lucky, of Missouri, was Vice-President last year, and responded to the address of welcome. The next meeting will be held in St. Louis during September of next year.

POISONING IN THE DOG.

By Dr. Wm. J. Reagan, Paterson, N. J.

A Paper read before the Passaic County Veterinary Medical Association at Paterson, N. J., March 3, 1903.

We as veterinarians in the course of our daily practice are often called upon to treat cases of "poisoning in the dog," which are sometimes difficult to diagnose, the symptoms often resembling those of contagious or constitutional diseases. We are often called to treat dogs which the owner states has a bone in his throat, or has swallowed something foreign—stones, coal, sticks or other articles. Now, in making an examination of such cases it is well for the practitioner to be on his guard. The dog may, as the owner states, have swallowed a foreign body, or he may have a fish bone or other foreign body lodged in his throat, or between his teeth, but he may also be suffering from rabies, and one cannot be too careful of this point, or from a basilar meningitis, or a phrenitis, from a blow on the head, or obstruction of the bowels, or a simple gastro-enteritis. A correct diagnosis can only be made in these cases by exclusion, and even by this method the practitioner is often baffled by the many conflicting symptoms of the case.

When called upon to treat a dog with symptoms of gastro-enteritis, with or without paralysis, partial or complete, of the lower jaw or of the facial muscles, I first of all examine the eyes. In rabies there is a wild unnatural look, the pupil of one or both eyes is or are dilated; they are generally contracted in lesions of the brain, other than rabies.

The condition of the eyes, the peculiar hoarse howl (half howl, half bark), and the tendency to bite and snarl in an unreasoning way, are strongly indicative of rabies. In dumb rabies the lower jaw may be, generally is, paralyzed, but this is not diagnostic; it may also be paralyzed in a disease of the brain other than rabies, and also the animal may show a tendency to swallow sticks, stones, grass, earth, coal and other foreign bodies, but this sometimes occurs in gastritis, indigestion, and

numerous other morbid states. I next examine the buccal cavity. We may find extensive ulcerated patches, with considerable sloughing, with whitish blotches, scattered over the mucous membrane, and a reddening and tumefaction of the gums. This condition of the mouth is strongly indicative of corrosive poisoning, but we must not confound this condition with the wounds and lacerations of the mouth produced in the rabid dog by biting, or with lesions produced by fish, or other bones lodged between the teeth, or in the throat.

We should always look for these latter, having examined the mouth, in the meanwhile having interviewed the owner in regard to the history of the case, how long the dog has been sick, whether or not he has acted in an unnatural manner, whether he has been chained, or loose, or whether he has been bitten, whether or not he has been fed on meat that has been spoiled or tainted (ptomaine poisoning), whether he was first noticed to be sick at night or in the day time. Dogs are generally poisoned at night. I next examine the stomach and bowels through the abdominal walls. If there are foreign bodies of any size in the stomach or bowels we may detect them by palpation. In both toxic and non-toxic gastro-enteritis we have tenderness on pressure, but in toxic gastro-enteritis there is a peculiar tenderness of the abdominal walls. In poisoning by arsenic especially, and other corrosive poisons (arsenic is the one generally used on the dog), we have intense salivation, in marked contrast to what is seen in rabies, in which disease the mouth, contrary to general opinion, is generally dry. Also, in poisoning by arsenic, and the corrosive poisons, there is an intense desquamative nephritis and the urine is thick and albuminous. This condition of the urine we do not have in rabies. The urine is sometimes entirely suppressed in arsenical poisoning. In corrosive poisoning the appetite is generally gone, and, even if the dog takes food, it is immediately rejected; in rabies he sometimes eats ravenously and also retains the food. When we arrive at a diagnosis of corrosive poisoning the prognosis is grave.

If we are called in time, recognize the nature of the case, and give, in arsenical poisoning, the hydrated sesqui-oxide of iron with magnesia, or, in case of mercurial poisoning, albuminoids, eggs, etc., and combat the increasing weakness of the heart with stimulants; nothing irritating to the stomach must be used; brandy or whiskey are positive poisons in these cases, and will go far toward hastening a fatal result; opium and belladonna internally. Purgatives still farther irritate the corroded stomach and bowels. We may save the animal's life, but convalescence is a slow and tedious process, and the animal rarely recovers his original health and condition; he is generally subject to periodical attacks of gastritis.

On autopsy of cases that have died of arsenical or other corrosive poisoning we find an erosion of the entire gastro-intestinal mucous membrane, with hæmorrhagic infarcts, and petechia. We may find traces of Paris green when this poison has been used, but must not confound this green coloration with the chlorophyl of the grass that dogs sometimes eat. We often find a mechanical obstruction of the bowels due to the adhesion of the inflamed mucous membrane to masses of fæces. There is more often constipation than diarrhœa in these cases. We also have enlargement, sometimes enormous, of the liver in poisoning by arsenic and other metallic poisons.

In poisoning by strychnine, the only other drug generally used on the dog, the symptoms are characteristic, and cannot be easily mistaken. Death is rapid in a majority of cases, but if the practitioner be called in time, and the dose is not immediately fatal, we may give chloral, bromide of potassium, which are the best antidotes, conium or veratrum viride hypodermically, or inhalations of chloroform, and avoid all noise. Remove dog to a dark place, empty stomach, give tannin internally. In non-fatal cases the dog rapidly recovers, but he is exceedingly susceptible to the action of strychnia. On post-mortem there is one characteristic to be noted, and that is that the animal is in a position of extreme opisthotonos, with the back curved on itself, and the limbs rigidly extended.

In cases where the dog ingests pounded glass, we have traumatic gastro-enteritis with obstruction of the bowels nearly always. The animal shows a disinclination to move, but there is no salivation as a rule, and we have not the extreme agony that attends toxic gastro-enteritis ; there is an absence of high fever. We give emolients, linseed oil, olive oil, eggs, milk, opium to relieve the pain and quiet the bowels. Support the dogs' strength with broths if he will eat ; if not, with rectal injections of food. Where glass or other powdered material has reached the lower bowels we can sometimes reach the hard compact mass with forceps and so break it up and remove it piecemeal. I have done so in a number of cases, or use a forced enema of olive oil.

Prognosis in these cases is grave ; the patients generally die of perforation of the bowels or stomach with a consequent complication of peritonitis. On post-mortem we find hard gritty concretions in the bowels, sometimes find articles of glass in the stomach. It is rare that dogs are poisoned with phosphorus paste, put down to poison rats, but it occurs occasionally. We have gastro-enteritis without ulceration of the buccal mucous membrane. The smell of phosphorus on the breath, generally diarrhœa, stools clayish in color, and later a milky discharge. We give venice turpentine, eggs. Prognosis is grave. On post-mortem we find a wide spread fatty degeneration, enlarged liver and spleen, and a desquamation of the gastro-intestinal mucous membrane. "The stool in these cases is sometimes luminous in the dark."

DR. JOHN J. REPP, Secretary of the American Veterinary Medical Association, who severed his connection with the Iowa Agricultural Experiment Station at Ames, during the past summer, has located in Philadelphia, Pa., where he is engaged in private practice. Incidentally he is in the third-year class in medicine at the University of Pennsylvania, and will finish the course, in order to fit himself for advanced work in the field of comparative medicine. His address is 5249 Addison Street, where all correspondence in relation to association affairs should be addressed.

STENOSIS, FOLLOWING AMPUTATION OF THE PENIS.

By A. H. Ide, V. S., Lowville, N. Y.

A Paper read before the 13th Annual Meeting of the New York State Veterinary Medical Society, at Ithaca, Sept. 15-16, 1903.

The subject of the operation was a bay gelding, nine years old, suffering from paralysis and ulceration of the penis, of long standing. Amputation was advised and decided upon. The horse was prepared in the usual way, cast, and placed on his back. The mode of operation, taken from Liautard's "Operative Veterinary Surgery," page 573, and Williams' "Principles and Practice of Veterinary Surgery," page 635, was as follows:

The penis was secured with a ligature at its end and drawn out of the sheath. A catheter was introduced into the urethra and retained there by the passage of a ligature around the penis an inch or two above the seat of the intended incision. The ligature, which was of strong twine, was passed through the healthy portion of the penis with a stout packing needle in order to prevent slipping and withdrawal of the penis into the sheath. An incision of the skin covering the penis was made entirely around the organ and down to the cavernous body, with the precaution of drawing the skin slightly backward, so that when the amputation should be completed and the skin allowed to return to its position it would slightly overlap the stump of the penis. The cavernous body was then divided, carefully avoiding injury to the urethra. The urethra, thus reached, was dissected from its groove forward into the cavernous body for a length of 1½ to 2 inches; and, the catheter removed, the division across the urethral canal completed the amputation.

The removal of the diseased tissue being thus effected we had before us the stump of the cavernous body, almost dry, the hæmorrhage having been prevented by the upper ligature, which secured a good hold and a good view of the mutilated organ.

The urethra was then slit on its inferior border on the median raphé and both flaps turned upward and brought into contact by interrupted sutures with the skin, which had been so

divided as to overlap the stump. These sutures are made close to each other of strong silk, or catgut, the result being that the stump of the penis carries at its lower margin a slit of from one to one and a half inches in length. The hæmorrhage was slight.

The after-treatment consisted of washing the parts with zenoleum solution, twice daily. The animal did nicely for about two weeks, at which time my attention was called to the fact that he was not passing urine freely. An examination revealed that the sheath was very nearly closed in front of the stump of the penis. The adhesions were broken up three different times, and, not being successful thus in keeping the passage open, I decided to open the sheath about six inches posterior to the end, and on the median line, carrying the incision through the urethra, lengthwise, for three inches, which was done. The urethra being sutured to the skin, the edges soon became adherent, forming an artificial opening from which micturation is carried on without impediment and with no inconvenience.

It is obvious that the closure of the preputial cavity anterior to the stump of the penis was due to non-union between the urethra and the skin, together with the absence of the amputated portion of the penis from the preputial cavity, allowing the outer skin of the sheath to collapse. This brought the edges of the inner skin into close proximity, with the natural sequence of healing of the parts, resulting in stenosis, as there was no stricture of the urethra.

From the perfect results attained by forming an artificial opening at the posterior portion of the sheath, as described above, I feel warranted in advising that method of procedure in such cases, and would amputate the diseased portion of the penis in a simple manner, closing the urethral end of the organ.

This method seems commendable on the grounds—

(1) Of cleanliness, for the animals urinating into the sheath, as of amputation by the regular mode, would be a source of filth;

(2) The simplicity of the operation; and

(3) The prevention, or avoidance, thereby effected of stricture, or stenosis, of the sheath or urethra.

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

MALADIE DU COIT.

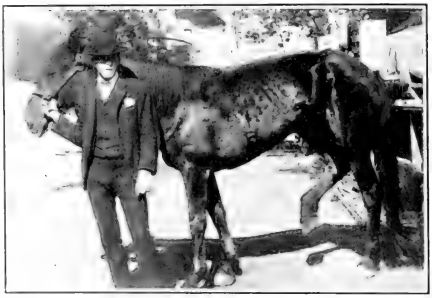
By Dr. J. P. FOSTER, State Veterinarian, Huron, S. D.

The accompanying photos illustrate a case of maladie du coit which recently came to my notice. The subject was a black mare, which in good condition had weighed over 1200 pounds, but on September 21st, the day when I destroyed her, she was in a greatly emaciated condition. She was bred last spring to a stallion which has since died of maladie du coit, and undoubtedly contracted the disease from him. The symptoms manifested in this case are well described in Hanson's "Practice of Equine Medicine" in the following: "The genital or-

gans become swollen, the mucous membrane thrown in folds and covered with a gelatinous-like fluid; red spots or erosions on the mucous membrane may also be present. The inflamed condition of the clitoris causes the mare to stretch herself and eject small quantities of urine at varying intervals; the lips of the vulva open, the erect clitoris is shown, and there is switching of the tail. On the body and legs are indolent swellings the size of a fifty-cent piece; these may disappear and reappear in other places. These swellings are said to be caused by an infiltration into the papillary layer of the derma. The most serious symptom is the paralysis of the posterior extremities; the ani-

mals drag their toes, rock their bodies, and cross their legs somewhat similar to cases of spinal meningitis or influenza. This paralysis is apt to be progressive, causing a dropping of the ears, paralysis of the facial muscles, of the lips, eyelids, etc.; soon they go down and are unable to get up, get bed-sores, and die from emaciation, paralysis, or are destroyed."

The swellings "the size of a fifty-cent piece" are noticeable in both photos; in one, over sides of the body; in the other, at the sides and below the vulva. These swellings are spoken of in Malkmus' "Clinical Diagnostics" as "urticariform swellings." Paralysis was very marked and the mare would fall to the ground when urged faster than a slow walk. The muscles of the face and under lip were partially paralyzed. There was alternate raising of the hind feet with extreme flexion of the hock; then the hock would relax and the foot would be returned



to within eight or ten inches of the stable floor and held in this position for perhaps a full minute; then the foot would be returned to the floor, and the same performance would be gone through with the opposite leg. The photo shows this position of leg and foot. In one of the photos some depigmentation is shown on skin of anus and vulva, and several ulcers may be discerned on the enlarged and distorted clitoris (this may be better seen by using a strong reading or magnifying glass). Post-mortem showed scars and active ulcers in vagina and vulva, walls of uterus enormously thickened, left ovary much enlarged and greatly inflamed. Inflammation was markedly apparent in both hip joints. On account of lack of time and proper instruments, no examination was made of brain or spinal cord.

THROMBOSIS OF THE ANTERIOR VENA CAVA IN COW.

By W. G. Hollingworth, D. V. S., Utica, N. Y.

Subject, Jersey cow, five years old, with the following history: Had been showing distressed symptoms for two years, sometimes more marked than at others; especially with the respiration. During her bad spells, loss of milk and appetite would occur. This would last a few days, then pass off for a short time. The periods were gradually becoming more frequent, till at last there was noticed a swelling on both sides of neck, enlarging slowly, head and fore extremities slightly swollen.

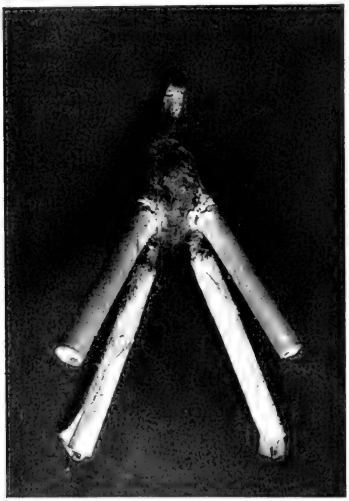
Previous to my being called, he had two professional opinions, each different, the subject becoming perceptibly worse. He made up his mind to try a third one, so he called on me. As it was a valuable animal he wanted to do all he could for her.

When I arrived at the farm the cow had wandered away, through a piece of woods down a gulf, all by herself. On examination I found her standing in a braced position, breathing, very labored, 72; temperature 101.2, pulse 108, eyes staring; the jugulars were greatly enlarged; head and legs somewhat swollen; tongue protruded; intercostal muscles bulging, and grunting. On auscultation detected a great amount of fluid in thoracic cavity (hydrothorax); heart seemed to be all right; increased bronchial breathing above the water line; dullness on percussion on both sides.

Diagnosis.—Thrombosis of the anterior vena cava, accompanied by hydrothorax, but I did not tell the owner till I had thought well of my case—as before stated there had been other diagnoses, and of course I wanted to be correct. I felt sure that I had to deal with something that impeded the return circulation. After telling him (the owner) my opinion, he wanted to have me tell him the trouble so he could understand it, so I told him that the large vein coming direct from the heart before it subdivided was plugged, and the lung cavity was half full of water. He said he would have to see it before he believed it, as he had made up his mind it was "lung fever" of a chronic form. From what he said, I should judge that was one of the diagnoses; the other I could not learn, as he had forgotten it.

Prognosis.—This is what he wanted to know. I told him it was unfavorable, and asked him to let me destroy her where she was; but that did not suit; something must be done; while there was life there was hope, as he thought a great deal of her.

I was anxious to hold a post-mortem, so I made up my mind to do something. I told him that to give medicine to her where she was, would be very inconvenient, and the best thing to do was to get her back to the barn, and to climb the hill and go through the woods would kill her. I made up my mind that that would be the best thing, but I did not tell him my thoughts, so he thought we had better get her home. So we started our up-hill journey; the first few steps were performed very well. One was stationed at her head to pull; one on each side of hips to push, and I took the tail hold. I had an object in selecting this position, as every once in a while I would give



it a twist, and that would force her ahead a few steps. Before we arrived at the top of the hill, I made up my mind we had a job on our hands. On our way up she would have to rest very often. I could see that the end was near, but was anxious to get her near the buildings and under cover, as it was commencing to rain. When on the level the owner wanted her to rest long enough to give her strength and asked me to give her something, but everything was at the barn. I told him it was getting late and raining and thought we had better proceed; another twist; in fact, it needed constant twisting now, but the

end came fast; she dropped dead very near the barn. I had a happy thought, and the scheme worked all right. We hitched a team of horses on to her, dragged her to the shed, and commenced with the post-mortem. I felt quite anxious, but confident. I placed her on her back, cut through sternum, also down to jugulars. When the thoracic cavity was opened a great amount of effusion poured out, slightly yellowish, and free from fibrinous flakes. Pleura seemed normal; lungs were compressed; removed the heart, but before I did this I felt for the vena cava, and, sure enough, there was the thrombosis, very near the bifurcation of the jugular, as seen in the photo. I had the lookers-on feel for themselves. I now removed the same to make a specimen. I felt very good as to the result of the post-mortem, as it coincided with my diagnosis to a letter. It was quite a relief, and the expressions were quite flattering and funny.

LESION OF THE CAPSULAR LIGAMENT OF THE STIFLE IN HORSE.

By Francis Abele, Jr., V. S., Quincy, Mass.

Horse was brought from city stable to country home to be cared for during recuperation from lameness. History was, that horse had been found lame when taken from the stall. Diagnosis, muscular lameness of gluteal region. Antithermoline applied with rest, and horse improved. Work, or rather exercise, brought lameness back worse than before. Blister was recommended, then horse was sent to country home for nursing.

When called, found gluteal region atrophied badly. Region of stifle much enlarged and sore. Horse held foot almost free from ground. Diagnosed fractured hip. Put in slings and in four weeks horse seemed all right. Exercise, however, again made him worse than before. Suggested another doctor for consultation. He diagnosed inflammation of capsular ligament of stifle joint, to which I agreed and admitted error.

Held post-mortem. Removing skin found blood discoloration on anterior surface of patella showing bruise of bone at that place.

On trying to remove extensor pedis to get at ligaments, opened into capsular ligament of stifle joint. The synovia was discolored by blood. Here the description differed from Möller's illustration. The abnormal enlargement of the villi was very marked and the 1¼ by ¼ inches was none too large.

The corresponding joint was opened to compare and the

sinus-like distentions were more apparent. There seemed to be but one erosion and that on the articular surface of patella.

I had seen cases of gonitis before, but this was my first opportunity for a post-mortem on one. When we consider the serious prognosis for such a case, these incorrect diagnoses appear strange. To err is human, to forgive divine.

VERMINOUS ANEURISM IN A SIX-MONTH-OLD COLT DUE TO STRONGYLUS ARMATUS.

By JOHN J. REPP, V. M. D., Philadelphia, Pa.

February 22, 1903, I received from Dr. H. J. Hagerty, Dubuque, Iowa, a specimen, together with a letter, the pertinent part of which I quote:

"This specimen was taken from a six-month-old colt. It seemed to be the celiac axis and that it was plugged up and the seat of an aneurism, and that death was caused by shutting off the blood from the parts which the artery supplies. Would you please examine it and let me know the cause of the trouble. The colt had been failing for two months before death, but never showed any colic and ate fairly well up to the time of death."

I found the mass to consist of part of the posterior aorta and the celiac trunk and fragments of its three branches, the gastric, splenic and hepatic. There was arteritis involving all the arterial coats, aneurism and thrombosis. The middle, or gastric branch was less affected than the other two. The mass, which was as large as a hen's egg, on being laid open with the knife was found to contain about a dozen young forms of the *Strongylus armatus* Rudolphi, ½ to ¾ of an inch in length. These larvæ had burrowed into the much thickened walls of the artery, where they lay in small channels which they had produced.

It is to be noted that the infestation in this case occurred in a foal, also that the symptoms were those of cachexia with absence of colic.

This trouble is not rare in young equidæ. Semner reports that at Dorpat, Russia, all foals have verminous aneurisms; Mather has seen an epizoötic of it in foals (Neuman).

The absence of colic may be accounted for by the fact that the mesenteric arteries were not involved, and that the principal obstruction was in the hepatic and splenic artery, the gastric being only slightly involved. Thus the circulation in the digestive tube was but little impaired.

REPORT OF A CASE OF FUNGOSUS TOXICUM PARALYTICUS.*

By W. A. Swain, V. S., Mt. Pulaski, Ill.

On the night of August 15, 1902, I was called to attend a valuable imported German coach stallion belonging to a company of men in Mt. Pulaski, Ill. Upon my arrival I found the horse apparently suffering from a mild attack of indigestion, having a normal temperature and heart action. He did not seem to be suffering much, and I anticipated no serious trouble in soon having him all right.

I gave him a dose of ordinary colic mixture, and waited an hour, to find him with no material change. I then repeated the dose which I had given at first, and at the end of one hour there was still no perceptible change. I now decided to administer an active physic, which I did, giving him four drachms of aloin, together with about four drachms of powdered zingiber. This seemed to afford him some relief. In about one-half to three-quarters of an hour from the time of administering the above physic, the patient ceased manifesting uneasiness and stood quietly in his stall. His temperature at this time was normal; pulse about normal; breathing, if anything, a shade slower than normal. He seemed to be rather stupid and sleepy and paid little attention to what was going on around him. I did not like his appearance, and, after consulting with the owners of the horse, we decided to call my father, Dr. S. H. Swain, of Decatur, in consultation. He was to come over on the early morning train. I then lay down and slept until a few minutes before he arrived, and did not see the horse again until he came, at which time we were surprised to find him manifesting strong symptoms of food poisoning. The first and one of the most prominent symptoms to attract attention at this time in this case was an apparent attempt to eat. The patient would thrust his nose into the hay, and to a casual observer would seem to be eating, but on closer observation it was seen that he was only nosing in the food in an unconscious condition. When led from his stall he was almost unable to stand, showing great lack of coördination, with pupils of eyes dilated and tongue hanging from mouth. The power of deglutition was entirely lost, making it impossible to administer medicinal agents per os. Temperature at this time $98\frac{2}{5}$ degrees, pulse about 22, respiration very slow and stertorous.

On questioning the attendant, we learned that two or three

* Read before Illinois Medical and Surgical Association, January 14-15, 1903.

days prior to the manifestation of the above symptoms the horse had torn up the floor of his manger, which had a false or double bottom, and had eaten a quantity of mouldy chaff which had there accumulated. We pronounced it a case of fungosus toxicum paralyticus, and ascribed the cause to the eating of impure, mouldy food as described above.

We gave him by hypodermic injection one-half gr. strychnia and forty minims fl. ex. digitalis, and had him moved about for about an hour. His temperature was again taken and found to have gone still lower, being now 96½ degrees; pulse almost imperceptible; respiration practically the same.

We tried two more hypodermic injections of strychnine and digitalis at intervals of an hour with unsatisfactory results as to temperature and heart's action. We then decided to try intravenous injections of stimulants; and for this purpose we agreed upon strong aqua ammonia, which was diluted with equal parts of distilled water, and injected into the median subcutaneous vein, administering two drachm doses every 30 minutes; with the most satisfactory results. Shortly after the first injection the temperature responded and rose to 98½ degrees; pulse 35; respiration more natural. We administered in all four injections, 30 minutes apart, at the end of which time the temperature was 103 degrees, pulse 48, and respiration practically normal. The pupils of the eyes had assumed their normal appearance and the power of deglutition had returned, together with the use of the tongue, which was now kept within the mouth in a normal position.

The subsequent treatment consisted of stomachics: Tr. gentian, two drachms; tr. zingiber, four drachms; tr. nux, two drachms; hydrochloric acid dil., one drachm; mixed and given at one dose, repeated three times daily for a period of about two weeks.

He was then changed to powders composed of about the above ingredients, less the hydrochloric acid, given three times daily in feed.

Our patient made a complete although not very rapid recovery; not being fully at himself for about six weeks.

GOOD RESULTS FROM BARIUM CHLORIDE GIVEN BY THE STOMACH.

By Hugh S. Maxwell, V. S., Salina, Kansas.

I wish to report an experiment I made with barium chloride. This new drug I have used this season repeatedly with success,

but almost every veterinarian that I met would warn me against its use; but as it had never failed me, and I had seen no bad results, I continued its use daily, administering from two to three drachms at a dose in a quart of water. A week ago I purchased a bronco, and when trying to lead her the man on the rope let her rear up and fall backwards, fracturing the occipital crest. I kept her a few days to see the outcome, and finally she showed serious symptoms and became unmanageable. I concluded to kill her, and that I would test barium chloride. At 9 P. M. I gave her five drachms; she became quiet in six minutes, and laid thus for fifty-three minutes; her bowels moved in nineteen minutes. In one hour and twenty minutes I gave her a second dose of seven drachms; her manner following this was almost the same as after the first, except that her respirations were more labored, and her pulse stronger and slower. At midnight I gave her a third dose of nine drachms; in about ten minutes she became very quiet, her respirations were exceedingly long and labored, her pulse almost imperceptible. She continued in this condition for about thirty-eight minutes, when she became very restless, too weak to raise her head from the ground, striking severely with both fore feet, but never moving her hind ones. At 1.15 I pithed her.

I feel safe in saying that we may use from two to five drachms with safety, but from all that I could see I think three drachms will purge as quickly as more. I have seen movements of the bowels in fifteen minutes after administering a two-drachm dose to a 1400 pound horse.

"SHEEP: Principal Breeds. Brief Discussion Relative to Sheep Husbandry in Louisiana. Some of the More Important Local Parasitic Ailments. Results of Experiment with Nodular Disease of the Intestines." By W. H. Dalrymple, M. R. C. V. S., veterinarian Louisiana State Experiment Station, Baton Rouge. In this bulletin of the Agricultural Experiment Station Dr. Dalrymple has taken up briefly the subject of sheep husbandry, with a description of the various breeds, each of which has a characteristic illustration. He describes many of the local internal parasitic diseases of sheep as well as "the nodular disease of the intestines," a description of which was given in the last volume of the REVIEW by Dr. Reynolds, of the Minnesota Station. Dr. Dalrymple gives an account of an interesting experiment with the disease.

EXTRACTS FROM EXCHANGES.

FRENCH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

ENCYSTED PERITONITIS DUE TO A FOREIGN BODY [*Prof. G. Moussu*].—This case has given occasion to the Professor for one of the clinical demonstrations which are so commonly resorted to in the French schools. The animal, a four-year-old cow, had been sick for more than a month with continued digestive troubles. In standing, her legs were brought close together; the hind legs were swollen; there was a permanent tympanites; loss of appetite, abundant black fœtid diarrhœa. She coughed some; her temperature was normal. Examination of the chest was negative, also that of the heart. Abdominal manipulation and auscultation were negative. Percussion over the right hypochondriac region showed great sensibility and soreness, which was absent on the other side. Examination of the genito-urinary system indicated nothing. The diagnosis was very difficult. Was it tuberculosis? The cow was tested, without result. Finally, one day as the animal got up in her stall a manifest gurgling noise was heard and localized to the superior part of the right hypochondriac region. This noise was perceptible for a moment only and soon subsided. Yet, it could be heard again if the animal was pushed to and fro. An exploration in the eleventh intercostal space allowed the removal of fluid analogous to that taken in pericarditis by foreign body. This liquid permitted the diagnosis. The treatment consisted in evacuation of the purulent sac by resection of the eleventh rib, but was followed by no satisfactory result. At the post-mortem a large encysted abscess was found between the inferior wall of the reticulum and the abdominal wall of the xyphoid region. This abscess had thick, sclerous walls and contained a needle 5 centimetres long. There were three other abscesses as big as an orange in the mesentery, and on the outside of the rumen.—(*Rec. de Med. Vet., Sept., 1903.*)

INJECTIONS OF PURE TINCTURE OF IODINE [*Mr. Joyeux*].—Those injections are not resorted to in ordinary practice, and serious accidents following their use have made the iodo-iodurated solutions preferred; and, yet, the author has had occasion to resort to the pure injections and obtained satisfactory results. He records the brief history of nine observations, tendinous

windgalls, capped hocks, cysts, and from the results he has obtained comes to the following conclusions: The injection of pure tincture of iodine for the above named diseases, made with the aseptic precautions resorted to in our day, seems to me free from danger and worthy of a more frequent application. I do not believe the method will fail less than others; it has its failures, but it often offers the opportunity to remove entirely and without leaving marks, blemishes, that are not obtained with blisters or firings. Sometimes a second injection is required, 5, 6, 8 or 15 days after the first; it is most advantageous to use flannel bandages. Unless there is marked lameness, the animal can be kept at work.—(*Rec. de Med. Vet., Sept., 1903.*)

The Use of Salicylate of Methyl [*A. Petit*].—For more than a year the author has used salicylate of methyl in the treatment of sprains of tendons or of ligamentous distensions, and he has obtained good results. Out of thirty cases treated this year, all have been cured in a very short time and with permanent results. Excellent results have also been obtained by the external use of the salicylate of methyl in the treatment of articular rheumatisms in dogs. One or two frictions daily are sufficient. There remains no mark of its use. The application of the drug in equine practice will prove very advantageous. The frictions need not be made very hard to obtain rapid recoveries.—(*Rec. de Med. Vet., Sept., 1903.*)

Dilatation of the Stomach in a Mule [*P. Castel*].—This abnormality is not common, as only five cases have been recorded by Leisering, Fitzroy, Phillpot, Koch, Barrier and Eilmann. This case deserves notice. It was in a mule, aged twenty-five years, which has never been sick. She was taken with colic after her noon meal and treated by an empiric, which failed to relieve her. After 26 hours of suffering the author was called. The animal, although standing, seemed ready to drop. She stood with the head down, staring eyes, dilated pupils, mouth partly open, mucous membranes pale, extremities cold, abdomen slightly tympanitic. The end was evidently near. The animal dropped and died after making useless efforts to vomit. The post-mortem was made three hours after. The small intestine was the seat of extensive hæmorrhage; the stomach was extremely distended although its position and relations were normal. The organ measured 0.58 centimetres in its transversal curvature, from the bottom of the left to that of the right *cul-de-sac;* from the anterior to the posterior face it measured 0.38 centimetres. While normally the

capacity of the stomach is between 9 and 15 litres, this was between 50 and 55 litres. The walls had their normal thickness; the mucous membrane was not altered, and to all appearances this condition of the organ was not the result of a pathological condition; it had certainly been compatible with the general health of the animal for at least a great part of its long life.—(*Revue Veter., July, 1903.*)

Queer Treatment for Œsophageal Obstruction—Fatal Manipulations [*H. Gilbert*].—A cow was sick from early morning; she stopped eating suddenly while partaking of a meal of chopped carrots. The empiric of the town was called, and having detected a piece of carrot in the œsophagus took a piece of a broom handle and pushed it down the animal's throat. Immediately after a large swelling developed in the parotid region, and the superior part of both jugular grooves, but the foreign body was not displaced. A second introduction of the broom handle gave no better result. The attendant retired to his home to consult some books, and at his return poured into the poor brute's throat, notwithstanding its struggles, *two pounds of lead shot No. 8*, mixed with sweet oil. The result was not long in coming: the cow was dying as Mr. G. was called. At the autopsy the piece of carrot was found still in the œsophagus. The lungs were congested and the small bronchi literally stuffed with shot.—(*Rev. Vet., July, 1903.*) [This seems to us a case worthy of the interference of the S. P. C. A.; and on reading it, one will ask, why is not the protective law of the profession yet passed in France?—Editor.]

Serious Traumatism of the Eye—Injection of Collargol in the Jugular—Rapid Improvement [*M. Brun*].—Due to traumatism, a horse had a laceration of the cornea, through which passed a big hernia of the iris; the eye was also the seat of an abundant muco-purulent secretion. Warm and repeated washings with boricated camomile tea and atropine in the eye failed to give any result. The author tried intravenous injections of collargol, 40 centigrams in suspension in 10 cubic centimetres of water. The second day after the injection, the protruding parts of the iris had almost disappeared; the collargol was continued for five days in frictions made on the inner face of the thighs, of the fore arm and on the course of the jugular of the right side. A few days after the alarming symptoms had considerably improved, and finally the eye, somewhat atrophied, resumed a satisfactory aspect. The crystalline lens remained opaque.—(*Soc. Centrale, June, 1903.*)

Sarco-melanotic Infection Giving Rise to Pleurisy in a Mare 16 Years Old [*Mr. Ravier*].—The subject of this record was an animal, grey in color, used for heavy draught, which presented all the symptoms of thoracic effusion. The animal was put under treatment, consisting in repeated punctures of the chest, injections of artificial serum, and in the meantime strychnia, digitaline, caffeine, iodide of potassium at various times. During the first seven days of the treatment 100 litres of fluid were removed, 30 being taken off on the second day. As for the injections of serum, which lasted until nearly the end of the treatment, 53 litres were administered, some under the skin, but the balance in the jugular. The animal died in excessive general emaciation. At the post-mortem two melanotic tumors as big as a nut were found in the sub-scapularis muscles, also in the chest a lobulated mass, enveloping the pericardium, adherent to the ribs and obstructing the entrance of the chest. Numerous melanotic tumors of various sizes existed along the vertebræ and the superior extremity of the ribs. There were a few small ones in the spleen and liver. All the other organs were sound. Of the pleurisy there was as lesions only a rough appearance of the surface of the lungs. For the author, it is evident that had it not been for the early and repeated thoracenteses which were performed and the injections of serum, the mare would not have lived as long as she did, and consequently that this therapeutic measure is always indicated, and that the melanotic affection was the cause beyond doubt of the pleuritic trouble.—(*Prog. Veter, July 12, 1903.*)

Strange Case of Direct Intestinal Obstruction in a Horse—Eserine and Pilocarpine [*M. Desprunie*].—An old pony after a fair day of work was returned home and put in the stable. The next day he refused his food and showed indications of constipation. Mild laxative treatment was ordered, but without result. There being no change in his condition, aloes was prescribed, and also rectal injections every hour. No purge the next day, but swelling round the anus, attributed to the improper use of the syringe for the injections. 0.06 centig. of eserine and 0.10 of pilocarpine were administered in 5 c.c. of distilled water. Salivation was soon manifested, but no fæcal movements after 10, 30 minutes, and even after an hour and a half. The next day no change, except that the swelling around the anus was smaller. New injections of eserine and pilocarpine were made—0.10 gr. of the first, 0.15 of the second—the mixture divided in two doses. After the second

dose was given, 25 minutes after the first, abundant relief of the abdomen occurred—too much so, as opium had to be resorted to so as to control the pains, the efforts and the abdominal flow. After a few days of rest, laxatives and finally aloes completed the clearing of the abdomen. It was only five days later that the explanation of the trouble and that of the swelling of the anus was found—an abscess was detected, fluctuating, at the anus; explored, punctured and emptied of two litres of thick pus of healthy aspect. This was the last that Mr. D. saw of this animal. From the consideration of this case the author concludes that similar injections of eserine and pilocarpine can be used in one dose or in two, at 20 minutes apart, even in middle sized horses; that this quantity can be renewed without danger in less than 24 hours, and that if the second injection gives no result in one hour, the treatment is powerless, and the animal is condemned.—(*Prog. Vet., Sept., 1903.*)

ENGLISH REVIEW.

By Prof. A. Liautard, M. D., V. M.

Botryomycosis—Operation—Recovery [*A. R. Routhedge, F. R. C. V. S.*].—Fourteen years old, a brown mare has had for three years a tumor situated on the anterior face and a little below the elbow. First no bigger than a tomato, it was hard, not painful, and seemed to involve the skin and cellular tissue below only. Now, the hairs have fallen off, the skin is covered with little elevations, formed by the cicatrization of numerous small abscesses, which have formed, ulcerated and healed. The tumor is as large as a turnip and interferes with the action of the elbow; the mare is quite lame. The operation consisted in an elliptic incision of the skin, dissection of the mass and its removal from the surface of the extensor muscles. Two large abscesses, containing about four ounces of pus each, were found in the depth of the tumor. The wound was treated antiseptically with chinosol, chloride of zinc, according to indications. The suppuration was very abundant for fifteen days. The mare remained in slings for a month. The tumor weighed three pounds and two ounces. The diagnosis was confirmed by the microscopic examination made by Prof. McFadyean. There was no return of the trouble.—(*Journ. of Comp. Path. and Therap., June, 1903.*)

HYDRONEPHROSIS IN A DOG, WITH CONGENITAL ABSENCE OF THE OTHER KIDNEY [*G. Leighton, M. D., F. R. S. E.*].—On Nov. 14, 1902, this dog was examined for a severe diarrhœa, existing for three weeks. He is anæmic, and in bad condition. The pulse and temperature are normal. The conjunctivæ are yellowish. The abdomen is retracted, not painful; the fæces soft and yellowish. Oily purgation, tonics, and astringents were prescribed, but with little success. Another examination of the malady reveals nothing new. Treatment is continued and followed by slight improvement. The dog is returned to his master. After two months, he is brought back in worse condition. The back is arched, the animal walks with difficulty, and finally he is destroyed. The case is certainly an ordinary one, but as the cause of the diarrhœa had remained unknown, an autopsy is made with the hope of detecting it, but nothing was found to explain it. However, the examination of the urino-genital system is most interesting. The left kidney is absent. The right, on the contrary, is enormous. The ureter is sufficiently dilated to allow the introduction of the middle finger; it opens in a dilatation of the kidney, which is full of fluid. This kidney is a true type of hydronephrotic kidney. The bladder is normal, perhaps a little large. As there was no obstruction in the bladder, as there were no calculi in the ureters, and as the urethra was normal, the only possible cause of the renal condition must be looked for in the fact of the presence of a considerable enlargement of the prostate, which was pressing on the urethral canal. The case was one of hydronephrosis acquired.—(*Journ. of Comp. Pathol. and Ther., June, 1903.*

INTERESTING CASE OF HÆMATURIA RENALIS, DUE TO UMBILICAL INFECTION IN A COLT [*W. Scott, F. R. C. V. S.*].—Colt, three days old, suffering with severe diarrhœa. He has slight colic. His temperature is up to 105.2° F., the respiration accelerated, but no thoracic lesions detected. The umbilical cord is shrunken and dry. Opium, chalk, and rice water were prescribed, and also hot applications to the abdomen. A slight improvement took place, but he has a passage of pure blood per rectum. Eight ounces of urine were collected in a bottle; it is blood red colored. After the colt has urinated he immediately lays down. The animal grew weaker and weaker and died two days later. At the post-mortem, the abdomen was found containing about ten ounces of yellowish fluid. The intestinal folds round the umbilicus are glued together and ad-

herent to the surrounding tissues. The urachus is thickened and extensively inflamed. The bladder is distended and contains a bloody liquid, in which floats a large clot of blood. The kidneys and the ureters are sound. The superenal capsules and the lymphatics are inflamed. The liver is soft and friable. The left lung hypostatic. There were small petechiæ on the endocardium of the left heart and ante-mortem clots in both ventricles. The analysis of three specimens of urine passed in twelve hours shows that the color varied from the dark red to the cherry red and to a clear rosy hue. The reaction remained alkaline in each case, and the specific gravity varied between 1015, 1020, 1010. Each specimen contained albumin. Bacilli in great number were observed in the urine of the first analysis, but were less in the second and in the third also.—(*Veterin. Record, June 13, 1903.*)

Treatment of Tetanus by Intracranial Injection of Antitetanine [*By A. Gofton, M. R. C. V. S.*].—Remembering two cases of recovery recorded in the *Journal of Comparative Pathology and Therapeutics* of the month of Dec., 1901, the author decided to resort to the same treatment as soon as he had the opportunity. The method he used consisted in disinfection of the skin, incision of the temporal muscle down to the parietal bone, trephining with a good sized gimlet, injection of antitetanine (about 9 cubic centimetres), dressing with boric powder and sublimated cotton. In the two cases, he resorted to this treatment and which he applied about three days after the apparition of the tetanic symptoms, both animals were operated without difficulty; the injection was not followed by any ill effect and without diminution in the symptoms. Both patients died. They had received two injections each.—(*Veter. Record, June 27, 1903.*)

Two Interesting Cases [*C. E. Dayus, M. R. C. V. S.*].—The record of two calves born of two Hereford cows. The two mothers had been kept together during the winter and while in calf. The two calves presented an abnormal affection in the same leg—the right fore—with, however, this difference: in one the leg is reflexed at right angles, and passing under the sternum shows the foot on the left elbow; in the other the leg is simply extended backwards along the body with the foot resting on the posterior and external face of the right thigh. After being fattened, the two phenomena were sent to the butcher.—(*Veter. Record, July 11, 1903.*)

A Foster Mother [*P. McKinlay, M. R. C. V. S.*].—

After giving birth to a fine colt, a valuable mare died from a prolapsus of the uterus. Rather embarrassed as to how to raise the colt, the owner decided to call to service an old Ayrshire cow, whose udder, rather exhausted and teats pendulous, seemed to him likely to make him a good foster mother, although she had never sucked her calves. The cow took well to her new function; she seemed to be happy with her adopted (?) son, which jumped and kicked about her and seemed well satisfied with the little he got from the old cow.—(*Vet. Rec., July 18, 1903.*)

CORRESPONDENCE.

VETERINARY PRESCRIPTIONS OF A CENTURY AGO.

BALTIMORE, MD., Sept. 28, 1903.

Editors American Veterinary Review:

DEAR SIRS:—I enclose herewith a copy of a recipe for "Apoplexy or Staggers," taken from "The Complete Virginia and Maryland Farrier," published in Winchester, Va., in 1818.

This may afford some new (?) light on the subject treated of.

Very truly yours,

WM. H. MARTENET.

* * *

"No. 5. The signs of this disease are: The Horse will foam at the mouth white, and will seem dull-headed, and will have at that time a blue film over his eyes, and will wander much up and down: be sure to let him blood on both his neck veins within one or two days after he complains, and in the third furrow in the palate of his mouth, with the point of a Cornet-horn: You may run an awl into the gristles of his nose, something above his nostrils; the bleeding at the mouth and the nose will ease the pain in his head. The cure is, take a handfull of *Rue*, by some called *Herb-grass*, three cloves of *Garlick*, a spoonfull of *Salt*, a spoonfull of *Vinegar*, and two spoonsfull of *Aquæ Vitæ*; bruise all these together well, and then put the one half into one ear, and the other half into the other ear, with a little wool after it; put the liquor in with a spoon first, and then the herbs, and then the wool; and then tie or stitch with a needle and thread the ears up very fast with two listing garters; then presently fume him at the nostrils through a funnel with the stalks and peelings of *Garlick*, beaten in a mortar with *Mastick* and *Frankincense* mixed together; of these make pel-

lets as big as a bullet, and lay them upon a chafingdish of fresh coals, and the smoke will go up through the funnel into the head, and much comfort and cleanse the brain; fume his head three times a day till you see him mend: At the same time beat *Red wood-seed*, which grows in Winter-corn, by some called *Poppy-seed*, very small, and give as much of the powder at each nostril as will lay upon a six-pence, in two half horn-fulls of any beer; do this every morning: Or thus, if you cannot get *Poppy-seed*, then give him white *Poppy-water*, which you may likewise have at the *Apothecary's*, and give at each nostril a spoonful and a half at each time; it will make him sleep so soundly, that you may walk upon him from the head to the tail, and he will not stir; he will lay as if he were dead for a time; his sleeping will mightily refresh him: After you have given it to him, you will see him, before he falls down, to buckle and sally, till at last he will tumble down. Let him stand in a dark room and warm, where he may see no light; let him have bursten oats, and mashes of ground malt; let his drink be cold water; that which you put in his ears, must remain there twenty-four hours and no longer: Put wool, flax, lint, or a rag after it; stitching is better than a garter, for that will make the hair come white. Proved a rare cure."

Dr. P. O'Rear, of Indianapolis, Ind., city meat inspector and a prominent and successful practitioner, died of typhoid fever recently.

Dr. James Keeley, Inspector, B. A. I. Indianapolis, Ind., has resigned his position as inspector and entered the Army as veterinarian, having successfully passed the examination; he is now stationed at Ft. Thomas, Kentucky, in the Artillery branch.

Dr. Clarence E. Shaw (N. Y. S. V. C., '01), of Brooklyn, N. Y., was married on 21st ult., to Miss Murray, of Ithaca, N. Y. Dr. Shaw has been associated with Dr. Roscoe R. Bell as chief assistant for the past two years. We heartily congratulate him, and if his new estate brings him as much happiness as he deserves, he will indeed be a joyous benedict.

"Report of an Enzoötic Among Cattle Caused by a Bacillus of the Enteritidis Group," by John R. Mohler, A. M., V. M. D., and John S. Buckley, D. V. S., Pathological Division, Bureau of Animal Industry. This carefully prepared and well illustrated bulletin is reprinted from the 19th Annual Report of the Bureau (1902), and is a valuable contribution to our pathological literature.

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

ARMY VETERINARY NOTES.

The U. S. Army School for Farriers and Horseshoers at Fort Riley, Kans.—The first class of graduates from this army school, numbering about seventy-five men, has just been distributed throughout the Cavalry and Artillery. The men who thus returned to their regiments are so full of praise for the instruction they received and of the zeal and devotion of their instructors, that there can be no doubt of the practical success of this school. Liberal acknowledgment is due, therefore, to Dr. Plummer, 4th Cavalry, and Dr. Power, Artillery Corps, for their correct conception of the aims of this new army school, and for its successful practical inauguration and management. We hope to see established at Fort Riley, at some future day, a military veterinary school, where the young army veterinarian, preparatory to entering upon his duty with his regiment or corps, will have a chance to undergo a course of instruction in military veterinary hygiene, military veterinary surgery, medicine and horseshoeing. At the present time the military branches of veterinary science are not taught anywhere in this country, and the newly appointed army veterinarian has to wander guidelessly through a labyrinth of strange occurrences until he finally discovers for himself the needs and purposes of military veterinary science. How to treat quickly and successfully a case of colic on the march, when the horse with heavy pack and arms is rolling with pain in mud or on the rocky mountain side, the command pressing on, leaving the veterinarian behind with the frightened trooper on whose face is reflected the visions of a march on foot into camp some twenty or thirty miles distant; how to sew up a dirty wound on the legs or other

flexible part of the body, plaster it up and make the stitches hold out for a continued onward march; how to assist a severely lame horse to walk practically on three legs in the ruthless pursuit of an enemy where there is no safe place to leave him behind; how to remain calm at a profusely bleeding bullet wound in the midst of confusion of an engagement; how to quickly prepare a horse's foot on a rough mountain road when he has lost his shoe and there are no shoes on hand; how to make horseshoes and nails of scrap iron and make them stick, as it was done in the Philippine campaign of captured insurgent bolos (short swords) with a small portable forge brought on shore from a U. S. gun-boat; how to control glanders and other contagious diseases in war, with constant movements of troops, where the conventional rules of veterinary sanitary science, so beautifully laid down in our text-books, appear as an irony of fate and a ridicule to science; this and much more, as encountered in endless combination in warfare, ought to be taught the young army veterinarian, somehow and somewhere. That such instruction would repay the Government a thousandfold, could hardly be doubted by anybody, and it seemingly has paid to many European armies which have for so long a time maintained their military veterinary schools. Whenever our Army becomes thoroughly alive to ALL the different issues that confront it for its proper equipment in knowledge and practice, whenever it will become a thoroughly educated army in all of its branches, including the veterinary, then we can hope for the fulfillment of such a suggestion as that of the establishment of an army veterinary school. At present we have still to contend with voices of dissent, which doubt even the wisdom and practical necessity of establishing the army school for farriers and horseshoers, an institution which is so clearly of the greatest practical utility to the military service. We wish, therefore, to encourage the good work done so far and to be done hereafter, by Drs. Plummer and Power, in the training of competent military horseshoers, and we wish them to feel that in doing so they also fulfill a mission in gradually educating up our Army to an understanding of the value of military veterinary instruction, which in its infancy is already established with the course of instruction at the army school for farriers and horseshoers at Fort Riley.

OLOF SCHWARZKOPF.

Foreign Army Veterinary Notes.—While the promised improvements in the English Army Veterinary Department re-

main promises, and the English army veterinary surgeons are still patiently waiting for the appearance of the Royal Warrant, a most magnificent and thorough reorganization of the German Army Veterinary Service has just taken place. Emperor William, by a Royal Decree, dated August 27, 1903, and in his profuse fashion, has so thoroughly upset the old order of things in the Army Veterinary Service that even the German army veterinarians must have hardly trusted their eyes when they first read this Royal decree. He has smashed the old Military Veterinary School at Berlin (established 1793) and termed it a "Military Veterinary Academy"; the "pupils" of the former schools are now "military students"; the "Army Veterinary Department" is now styled "Veterinary Officer's Corps"; the old, reliable "veterinary officials" have become "commissioned veterinary officers"; the jaw-breaking German name "rossarzt" (horse physician) has been changed into "veterinaer." The new charges consist of corps staff veterinarians (majors) at army corps; of staff veterinarians (captains) at regimental headquarters; and of veterinarians and assistant veterinarians as lieutenants. There only remains the old title and rank of the inspector general of the Army Veterinary Service who is a lieutenant colonel, but as His Majesty has ordered the Minister of War to propose such other changes as may complete the reorganization of the veterinary officer's corps, they will be promptly forthcoming and will be generously approved. We report this complete reorganization of the German army veterinary corps with satisfaction, because it cannot fail to have some bearing upon our own future army legislation. There is no other branch of our Government which is so watchful of foreign improvements as the War Department, and our foreign military attachees will promptly report those great changes in the German army. Most of our arguments in Congress for improvements of the Veterinary Service in the U. S. Army were heretofore based upon comparisons with the principal foreign armies, and the more unfavorable this comparison is for us, the better will be the prospect of improvement upon the lines of those armies who lead in the experience of army organization. (O. S.)

At Randolph, N. Y., Sept. 16, 1903, Dr. Bert R. Wilbur, D. V. M., graduate of the New York State Veterinary College, '03, was married at high noon to Miss Belle Francenna Curtiss. Dr. and Mrs. Wilbur will be at home in Randolph, N. Y. after Sept. 16, 1903.

SOCIETY MEETINGS.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.

REPORT OF THE CLINICS AT THE MEETING HELD AT ITHACA, SEPTEMBER 15, 16, 17, 1903.*

Believing that a thoroughly illustrative clinic is one of the best methods for teaching the practical features of veterinary science, the committee in charge of the clinic for the meeting of the New York State Veterinary Medical Society attempted to arrange a clinic which would prove interesting and instructive, whether viewed from the pathologic, operative, or other standpoint. The cases offered might be arranged in three categories: (1) Experimental demonstration, including the demonstration of the effects of certain drugs upon blood pressure, by Dr. Fish. (2) Cases occurring in practice, of interest from a diagnostic or therapeutic standpoint, in which we include, as specially worthy of mention, some cases of that much dreaded malady, bursattee. (3) Operative work, chiefly of major surgery, and largely under anæsthesia. The latter constituted the greater part of the clinic.

Demonstration of the Effects of Drugs upon the Heart and Blood Pressure.

By P. A. Fish, M. D., M. D. V.

A manometer, containing a double column of mercury connected with a rubber tube and cannula, containing a solution of magnesium sulphate to prevent the clotting of the blood, was connected with the carotid artery of the horse. When the clamp was removed from the artery, the mercury in the manometer rose and fell with every pulsation of the heart. Floating upon one of the columns of mercury was a light lever which recorded every fluctuation of the mercury, due to the heart beat, upon a cylinder revolving at a uniform speed.

In this way was obtained a tracing of the normal heart beat, the force being measured by the vertical distance to which the lever rose and fell, the frequency being noted by the horizontal distance between the vertical curves. The blood pressure was determined by the position of the tracing above or below the

* Reported by Dr. W. L. Williams, Chairman of the Committee of Arrangements.

normal tracing; the former indicating an increased and the latter a decreased pressure.

The first drug employed was barium chloride; eight grains of the chemically pure salt dissolved in normal salt solution, was injected into the jugular vein. The results were: 1st, to increase the force of the heart beat, the vertical tracings being twice as high as the normal; 2d, to slightly decrease the frequency of the beat, or slow the heart; 3d, to increase blood pressure, as shown by the lever writing at a point above the normal. A moderate electrical stimulus applied to the vagus nerve produced a slight fall in blood pressure and the heart action was slowed a trifle more. In this experiment it would appear that the barium acts as a direct stimulant to the cardiac muscle, increasing the force of its contraction. The slowing effect would indicate that the drug has a mildly stimulating effect upon the vagus centre. The increased blood pressure would be due in part to the increased force of the heart's contraction and the greater amount of blood pumped into the vessels; also, in part, to the action of the drug in causing constriction of the peripheral vessels, either by stimulating the vaso-motor centre or by direct action upon the muscle fibres in the walls of the vessels. The fact that the heart did not readily respond to the stimulation of the vagus nerve, would indicate that the energy imparted to the heart's contraction by the direct stimulation of its muscle is sufficiently great to overcome some of the vagus control.

The second drug employed was atropine sulphate. Two grains of this alkaloid dissolved in normal salt solution were injected into the jugular. This produced a quickening of the heart beat and a rise in blood pressure, the latter being partly due to the former, but mostly to the stimulating action of the drug upon the vaso-motor centre. Electrical stimulation of the vagus nerve was entirely ineffective; this being due to the action of the drug in paralyzing the terminations of the vagus nerve in the heart. Stimulation of the respiratory centre was noted.

The third drug used was nitroglycerin. Two grains were dissolved in normal salt solution and injected as before. The result was a fall in blood pressure, due to the action of the drug in dilating the peripheral vessels. Respiration continued stimulated. Stimulation of the vagus was ineffective, causing the blood pressure to rise somewhat. Nitroglycerin tends to paralyze the vagus centre, but in this case there should also be

taken into consideration a probable continued action of the atropine upon the vagus endings.

The last injection was ten cubic centimetres of adrenalin solution, in the proportion of 1 to 5000 c.c. of normal salt solution. This proved ineffective, as there was no rise in blood pressure, as expected. The heart continued insensitive to vagus control, although stronger electric stimulation was employed. It is not improbable that the ineffectiveness of the adrenalin may have been due to the continued action of the drugs previously employed.

A Series of Cases of Bursattee.

(1.) A recent case of bursattee showing the disease in active stages. Owner, Mr. B., Ithaca, N. Y. The fore legs only were affected. First appearance of the trouble was three years ago in the summer. The second summer the sores were not so bad as the first. This summer the sores were not so bad as the first summer, but were worse than during the second summer. The case had received no treatment. When presented at the clinic two sores were apparent, one of which was healing and was well scabbed over. The other was partially scabbed but showed some raw surface which was discharging slightly. A few scars were noticed where healing had occurred. Treatment recommended was the frequent application of cold water or turning the hose on the affected parts several times a day. The application of antiseptics and emollients are of some use in keeping away the flies and relieving the irritation. (2.) An old standing case of bursattee demonstrating the result of treatment. The patient is a Kentucky bred mare, purchased by the present owner in 1895, and her history consequently not traceable beyond that date although rumor had it that the animal had suffered from bursattee sores prior to purchase. During the summer of 1896 the animal suffered from a sore on the right posterior coronet which refused to heal during the hot weather, and during July of the same year another sore appeared upon the right anterior fetlock in front, which also resisted treatment; a third and smaller sore existed upon the same limb and presented a circular outline with pale red granulations rising above the skin and highly vascular. Other sores of lesser magnitude appeared upon different parts, which were handled successfully. When presented on September 29th, 1896, there were no open sores, but a number of naked cicatrices raised above the skin, thickened and indurated. At the seat of the largest previous sore on the right posterior coronet the scar is very prominent

and almost horny in character. A diagnosis of bursattee was made, but as cool weather had come it was deemed inexpedient to undertake treatment, and the animal passed through the winter and spring without anything notable. On July 30, 1897, the patient returned with a well-marked bursattee sore ¾ in. across on the surface of the right anterior pastern, which stood out ½ inch above the level, hard, vascular and discharging a thin serosity. This was the seat of a prior ulcer and had broken out afresh on the 27th of July. The hardened portion of the ulcer was mostly cut out with a scalpel, after which the thermocautery was used freely, and then dressed with iodoform with a firm bandage. On August 2d, the patient was returned, the wound dressed with silver of nitrate followed with iodoform and a bandage as before; at this time two new ulcers were apparent on the left fore limb, both of which were cauterized with silver nitrate and bandaged with tincture of iodine. On August 6th it was found the iodine had blistered and inflamed the parts, and it was replaced with iodoform ointment 1–10. The sores gradually began to heal and improve and as the weather grew cooler healed completely. About July 1, 1898, the sores again appeared, and on July 10th she was again presented for advice; the sores had not been bad and were treated in the general way, by occasional cauterization with silver nitrate, followed by the daily application of iodoform, with a tight bandage. At this time the owner was advised to cease grooming the feet and legs during the hot season, and instead to shower these parts thoroughly for one-half to one hour daily with cold water, and to scrupulously avoid touching the feet and legs with comb or brush. Whenever any sores appeared they were to be treated upon the general lines indicated. From that time on the case has been handled in this manner with the result that each summer small superficial sores appear, but have been quickly repressed and have given no trouble. The patient as presented at the meeting was in fine condition and showing only very slight traces of what had been seven years previous, very unsightly and disagreeable sores. (3.) The patient is a chestnut mare used as a ladies' driver, and has been in possession of the present owner since 1889, and according to the history given had been affected with bursattee sores upon the feet and legs during the summers since 1892. During the winters she remained sound, the sores breaking out each summer upon the advent of hot weather. The mare was overheated, which caused the disease to break out anew, and during about ten days of ex-

cessive heat in June, the disease became much aggravated and the sores rapidly extended. When presented on August 26, 1897 she showed on the outside of the right hind coronet an open sore some three inches in length and deeply excavated from the use of caustics. On the outside of the left hind pastern was a second sore 1½ inches in diameter and level with the skin, a third sore 1½ inches across and raised above the level of the skin existed upon the metacarpus. A number of old sores and old scars were present on different parts of the limbs below the carpal and tarsal joints, and it was related that several of these had appeared upon the shoulders during the previous year. The condition of the patient was so repulsive that the owner requested that she be destroyed unless decided relief could be given. A careful examination of the ulcer on the coronet showed that it extended down upon and involved the lateral cartilage of the pedal bone about ½ square inch of which was bare and necrotic. The necrotic cartilage was excised and the cavity filled with an iodoform tampon over which a bandage was firmly applied. The other sores were dressed with iodoform with firm bandages. On September 26th, the animal had so far recovered as to be fit for driving and was discharged, with direction to continue the tight bandages with iodoform when the animal was in the stable. The patient was seen from time to time and made satisfactory progress until early in October the wounds were practically healed and remained so during the following winter. On July 18, 1898, the patient was again presented with bursattee sores breaking out afresh on the right posterior coronet at the border of the old scar. This was dressed with a 1% solution of pyoktanin. On July 21st the condition of the sore had not changed, but a new one had formed on the external side of the right metacarpus three inches above the fetlock and another sore at the interior and external part of the left anterior pastern, these were penciled with nitrate of silver and dressed with iodoform ointment and pressure bandages. The groom was directed to discontinue the use of brush or comb upon the feet or legs, and to shower the parts daily for one-half hour with the stable hose. During the succeeding weeks which were very hot and wet the disease was held in abeyance and the animal constantly used. New sores occasionally developed, but each responded promptly to the general line of treatment indicated. During the intervening years up to the present time the animal has been kept in close observation and during the warm season, the feet and legs have not been groomed, but sim-

ply showered with cold water. Superficial ulcers of small size have occasionally appeared, but each has responded promptly to the pencilling with the nitrate of silver and dressing with iodoform, with pressure bandages.

These two cases demonstrated to the attending members the value of careful handling of the feet and legs in horses affected with bursattee during the summer months. It showed very well that a horse affected with this incurable disease may be made thoroughly comfortable and agreeable in every way for ordinary work. An interesting fact in connection with these cases is that both of them have grown more and more resistant as the years have gone by, so that they are less and less affected each summer, which is contrary to the general experience that they become worse each year. It is somewhat rare, in fact, that a veterinarian has the opportunity of watching two cases side by side, one for six and the other for seven years, with opportunity for frequent and close observation and at the same time has every opportunity to apply and thoroughly test a given line of treatment. Most bursattee horses change owners during the first winter after the advent of the disease, so that a given case can rarely be followed.

SURGICAL OPERATIONS.

(1) *Vaginal Ovariotomy in the Mare.*—Operator, Dr. R. C. Reed, Elmira, N. Y. Operation performed September 15.

The patient was a five-year-old bay mare, of common breed and in good general health. She was unusually disagreeable to handle in the stable, and when approached would switch her tail and urinate, and threaten to kick. Her irritability was somewhat periodical, and was apparently related to œstrum. The patient was confined in the stocks, the tail fastened to a pulley overhead and stretched tightly, and the vulva and perineal region thoroughly scrubbed with soap and water, and then washed with 1-1000 corrosive sublimate solution. The instruments were sterilized by boiling in soda solution, and the operator's hands thorough cleansed and disinfected. The sterile soda solution at about 100° was then injected into the vagina, after which with a Colin's scalpel an incision was made just above the os uteri directly forward through the balooned vagina. The stab wound thus made was enlarged sufficiently to admit the entire hand of the operator into the peritoneal cavity and the ecraseur was then carried in and each ovary in turn crushed off. The operative time occupied but a few minutes. The animal

showed no visible reaction to the operation, the appetite and general appearance seemed normal, and the temperature was unaffected. She was discharged on September 21st apparently well. On September 28th the owner reported that the patient seemed much more docile, the disagreeable actions having largely disappeared.

(2) *Castration of Cryptorchid Horse.*—Operator, R. W. McCully, V. S., New York City. Operation performed Sept. 15.

Patient a small brown horse, four years old, weighing about 950 pounds, and in thin flesh. The left testicle was in its normal position and the right was concealed. Several ineffectual attempts had been made to remove the concealed gland, which had resulted in an extensive cicatrix in the region. The animal was placed upon the operating table on his left side, chloroformed, and the right hind leg drawn upward so as to fully expose the right inguinal region. The operative area was thoroughly cleansed and disinfected, and an incision made in the scrotal region parallel to the median line, and after considerable difficulty the internal inguinal ring was reached and an opening made through the fascia immediately anterior to the ring and the testicle located, but its attachments were so short that it could not be brought out through the external ring, which made it necessary to introduce an ecraseur into the peritoneal cavity in order to remove it. When removed, the testicle had no epididymus. Apparently those who had previously operated had succeeded in getting hold of the epididymus and removed it, leaving the testicle within the abdominal cavity. This is an error which is not very rare with inexperienced operators, as the epididymus is always the first part of the organ to descend into the scrotum, and can be easily grasped and cut away, while the gland itself remains above the internal ring. In order to remove the gland it had been necessary to insert the entire hand into the abdomen, and while engaged in removing the other testis and awaiting a tampon for the large opening made, protrusion of the intestines occurred, which was promptly corrected and a tampon inserted well up toward the internal ring. At the time, some of the veterinarians present contended that the tampon would not suffice to prevent further protrusion of the intestine, while others maintained that if the tampon was sufficiently large and placed deeply enough, it would be efficient. On the following morning, September 16th, the patient was found rolling in the stable in very evident pain and perspiring freely, with all the symptoms of strangulated hernia.

Upon examination it was found that the intestines had dropped down into the scrotum alongside the tampon and lay immediately against the sutures. After thorough cleansing, the intestines were returned into the abdomen and a larger tampon introduced up to the opening through the peritoneum and retained there by sutures in the skin wound. This gave immediate relief, and the patient soon began eating, and throughout the period of observation the appetite remained good. The tampon was left in position for three days, the temperature being closely watched in the meantime, and the external wound being disinfected daily. The temperature became slightly elevated, but did not pass 103°, and the animal continued to look bright and eat well. The elevation of temperature was apparently due to infection of the sac from whence was removed the normal testicle. After the removal of the tampon both wounds were regularly disinfected and convalescence occurred regularly, and the patient was discharged on the 29th of September, fourteen days after the operation, and after having been detained for several days longer than was apparently necessary, in order to guard against any possible error. The case was of special interest because of the absence of the epididymus, and further because of the protrusion of the intestine. It is alleged by the majority of operators, that protrusion of the intestine is obviated by rupturing the abdominal wall anterior to the inguinal ring instead of operating directly through it, but this case demonstrates, so far as a single instance could, the fallacy of that theory, and shows that if a large opening had to be made through which the entire hand could pass, an intestine could readily protrude, whether the opening be through or alongside the ring. In this particular case, protrusion could have occurred, no difference whether operated upon through the ring or alongside of it, as it is absolutely necessary, owing to the character of the attachment of the testicle, to insert the entire hand. The case also showed that protrusion of the intestines can be prevented by means of a tampon when it is of sufficient size and properly placed, and equally that an insufficient tampon would not obviate the accident.

(3) *Castration of Cryptorchid Horse.*—Operator, R. E. Waters, V. S., Gravesend, Long Island. Operation performed September 16.

Patient a two-year-old bay colt with castration scars on both sides, with the history that one testicle had not been removed. One of the scars was overlooked and it was believed that the hidden

testicle was upon the right side, where, after placing the animal upon the operating table on the left side, exposing the right inguinal region and disinfecting, an opening was made under chloroform anæsthesia only to find that an error had been made as to the side. The animal was then turned to the opposite side and an opening made in the left inguinal region and the testicle removed. In this case the operation was performed directly through the internal inguinal ring. Each wound was packed up to the internal ring with iodoform gauze, and retained in position for thirty-six hours when they were removed and the wounds disinfected. The after treatment consisted of daily disinfection of the wounds with internal medication as often as suggested because of fever. The temperature rose to 104° after two days and vascillated between 102° and 104° for several days. In addition to the local treatment ½ ounce doses of quinine were administered once or twice daily as an internal antiseptic. There was considerable swelling of the scrotum and sheath, but the animal retained a fair appetite throughout, and showed no marked appearance of serious disturbance. The wounds suppurated quite freely. The patient was discharged on September 30 after being detained longer than was apparently necessary in order to guard against any accident, especially as he was to be walked home, a distance of over twenty miles.

(4) *Castration of Colt in Standing Position.*—Operator, R. E. Waters, V. S., Gravesend, Long Island. Operation performed September 16.

The subject was a one-year-old bay colt of good size and in good general condition. The operation was performed upon the colt in the standing position, being backed into the corner of a stall and the twitch applied to the upper lip. The incision was made in the ordinary manner with the Miles' castrating knife, the spermatic cord severed with an emasculator. The case progressed without incident, and left the hospital six days later.

(5) *Arytenectomy.*—Operator, Dr. H. D. Gill, New York City. Operation performed September 16.

The patient was a black draft gelding of about 1550 pounds, in good condition, and had been purchased by the present owner during the early summer, and was found to be a "roarer" after a few weeks. The animal was placed upon the operating table and turned upon his back by means of ropes attached to his feet and passed through pulleys overhead. The operation was performed without chloroform. An ordinary tracheotomy

tube was inserted in the trachea at the usual place. After the throat had been shaved and disinfected, a longitudinal incision was made down upon and into the larynx through the crico-thyroidean ligament, cricoid cartilage and first tracheal ring. A pack was then placed in the trachea above the tracheotomy tube and was retained in position by sutures. Upon spreading the larynx by means of retractors the left arytenoid cartilage was seen to be motionless during respiration, while the right moved normally. The paralyzed cartilage was isolated by means of an incision completely encircling it through the mucous and submucous tissues, including the vocal cords, the adjacent tissues carefully dissected away and the arytenoid disarticulated and removed. The larynx was then packed with a sublimated tampon and the external wound closed with a single suture. The wound was dressed daily by being sponged out with a 1–1000 corrosive sublimate solution and the parts dressed with tincture of iodine, or with iodoform-ether. The tampon was removed from the larynx and trachea on September 16. The trachea tube was removed, cleansed and replaced daily until September 24th, when it was left out, and the wound allowed to heal. The laryngeal wound was dilated and the interior of the larynx carefully examined with the aid of a reflecting lamp, and the operative wound was apparently doing properly. On October 12, the patient was discharged. So far as could be seen at that time, the operation was entirely successful, and no interruption in the process of recovery had occurred.

(6) *Arytenectomy.*—Operator, W. L. Williams, D. V. S., Ithaca. Operation performed September 16.

The patient was a bay road mare in good condition and a bad roarer. She was placed upon the operating table and anæsthetized and turned upon her back with the head extended. The operative area was shaved and disinfected, and a tracheotomy tube inserted at about the middle of the neck. The usual incision was made over the larynx and after all hæmorrhage had been controlled in the soft parts, the incision was continued through the crico-thyroidean ligament, the cricoid cartilage and the first tracheal ring, the larynx dilated by means of retractors and the left arytenoid cartilage, isolated by an incision through the mucous and submucous tissues, the adjacent parts carefully dissected away and the cartilage excised at the articulation. The hæmorrhage was controlled and the wound dressed with iodoform and tannin and left open. The

patient was dressed daily the same as the preceding and the trachea tube was removed on the 22d of September. At this time the laryngeal wound being opened, a slight necrosis of cartilage was observed at the point where the arytenoid had been excised. The necrotic portion was curetted away after which the healing progressed without further incident and the animal was discharged on October 13. So far as could be seen at that date the operation was entirely successful.

(7) *Poll Evil.*—Operators, A. H. Ide, V. S., and W. L. Williams, D. V. S. Operation performed September 17.

The patient was a small gray gelding, aged ten years, in fair condition, weighing about 1000 to 1050 pounds and badly affected with poll evil. He was confined on the operating table, and placed under complete chloroform anæsthesia. The halter was removed and the mane and foretop shaved over the entire operative area, a longitudinal incision was made on the median line of the neck beginning somewhat posterior to the diseased part and extending forward over the occipital bone down to the forehead. The incision was extended down to the ligamentum nuchæ, the ligament was separated from the surrounding tissues and severed just posterior to the diseased part by an incision directed obliquely upwards and backwards and anteriorly it was excised from the occiput immediately at its attachment, removing a section of the ligament about eight inches long. This exposed the abscess cavity fully to view, the ligament having constituted its upper wall. With Luer's bone gouge forceps, a groove was cut through the occipital crest from behind to before on the median line, about ¾ inch deep and of a similar width. The remaining attachments of the ligament to the occiput were carefully curetted away from the bone, leaving it bare. When preparing to dress the wound it was discovered that an extensive sac extended outward and downward between the occiput and the wing of the atlas to about the level of the inferior part of the articulation, that the border of the wing of the atlas was necrotic, and that the articular bursa was bare, if not open. As the operation had been confined to the median line or within an inch to either side, the cause of the opening, if such was the case, was not clear.

A counter opening for drainage was made at the lower border of the sac, and the wound cavity packed with iodoform gauze, over which the wound lips were sutured. The tampon was allowed to remain in the wound for forty-eight hours, when it was removed and the parts washed and dressed antiseptically

daily. The patient apparently did well and everything seemed to be progressing favorably except for the presence of a discharge from the left nostril. On September 23d, the animal was found lying prone upon its side and unconscious, showing all the symptoms of pressure upon the medulla. It was at once seen that the animal could live but a short time. Upon post-mortem examination the occipito-atloid articulation was filled with pus and an opening through the synovial membrane existed over the left condyle of the occiput. The left guttural pouch was filled with a reddish gray pus and while it was in close proximity to the suppurating articulation no communication between the two could be traced. A preparation of the atlas showed that bone to have been affected throughout almost its entire extent, there being at various parts traces of periostitis with the formation of new bone and at the anterior part considerable patches of necrosis in and about the joint.

(8) *Ovariotomy in a Bitch.*—Operator, W. L. Williams, D.V.S.

The patient was a full grown white bull terrier bitch which had not bred. She was placed upon the operating table on the right side with the body extended. The operative area was shaved and disinfected and an incision made in the flank immediately below the anterior tuberosity of the left ilium. No anæsthetic was used. The incision through the entire abdominal wall was made at a single stroke. The left uterine cornu was brought up by means of a finger, and the ovarian ligament ruptured by linear tension. The right cornu was then brought out and the process repeated, after which the two cornua were broken off by linear tension, with the ovaries attached. The cutaneous wound was closed by a continuous suture. The operation, after the field had been prepared, occupied probably less than three minutes and the animal apparently suffered no shock. She was taken away immediately by the owner and no subsequent report has been received.

* * *

Three other important operations remain to be reported upon at a future time. In addition there were left over without operation three cases of fistulous withers and several minor cases.

PASSAIC COUNTY VETERINARY MEDICAL ASSOCIATION.

Regular monthly meeting was held at 169 Paterson Street, Paterson, N. J., on Tuesday evening, October 6, 1903, with Dr.

Wm. Herbert Lowe, President, in the chair, the following members being present: Drs. William J. Reagan, John H. Degraw, Wm. Herbert Lowe, and Wm. H. H. Doty, Paterson; Wm. J. Fredericks, Delawanna. Dr. Pope telephoned his regret at not being able to be present. Dr. J. Payne Lowe did likewise.

Minutes read of annual meeting and approved as read.

Dr. Wm. Herbert Lowe has undertaken the work of eradicating glanders from the State on the authority of the State Board of Health, and asks for the earnest coöperation of every practitioner. He reported that he had had watering troughs and drinking fountains for horses closed in Paterson, Passaic, Newark, Jersey City, Bayonne and other places in the infected districts. He spoke of the importance of proper disinfection of infected stables, blacksmith shops and hotel and road-house sheds. If all cases were reported to the State Board of Health the disease could soon be restricted and brought under control.

Dr. Degraw expressed the fear of assignment of reading of papers, as certain members had kept away from the meeting, and said if such members did not want to read papers, or were not prepared to do so, they need not stay away from the meeting.

President Lowe reported that he had George Locke, of Flemington, Hunterdon County, arrested for practicing veterinary medicine without a license; and that the grand jury of that county had indicted him for violating the law. Locke first pleaded "not guilty" before the court; later he retracted his plea and entered one of "non vault." Sentence has not as yet been pronounced by the court. The penalty for practicing veterinary medicine without a license is a fine of not less than one hundred dollars or imprisonment in the county jail for a period not less than thirty days, either or both, at the discretion of the court. So that George Locke is at the mercy of the court. "Dr." Sample, of Monmouth County, has already served five months in the Freehold penitentiary for practicing veterinary medicine without a license, as required by Chapter 18, Laws of 1902.

It was decided to send suitable cases to the next meeting for clinical demonstration.

This association was represented at the State meeting at Athenia, July 9, 1903, by Dr. R. O. Hasbrouck, Dr. Wm. J. Fredericks, Dr. George W. Pope, Dr. W. C. Ferguson, Dr. J. H. Degraw, Dr. T. J. Cooper, Dr. W. J. Reagan, Dr. John Kehoe,

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AMERICAN VETERINARY REVIEW.

DECEMBER, 1903.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, FRANCE, Oct. 15, 1903.

In my last chronicle I advanced the idea that in all probability steps would be taken by French veterinarians to express in a professional manifestation the affection and high esteem in which Prof. Nocard was held in his native country, and I spoke of the possibility of the creation of a committee to raise a fund to perpetuate for future ages the name of one who has done so much and who would have done much more had he lived, and who belonged to the veterinary profession.

At the time of my writing I was unaware that such arrangements had already taken place. The distance which separates me from my American friends is such that when news comes to me it takes so long to send it that by the time it appears in type it is quite stale.

At any rate, the veterinary profession of France has undertaken the work I alluded to; a committee has been appointed, and the following circular issued:

"SIR:—Some of the friends and students of Prof. Nocard have decided to raise a monument to the memory of the regretted maître.

"By the high value of his work, the importance of the services he has rendered, by the dignity of his life, Nocard is well worthy of this homage.

"We believe the monument ought to be erected at Alfort, near the laboratory where for twenty-five years he has worked without stopping, and realized so many important discoveries.

"We ask you to associate yourself with our undertaking by sending your donation to the subscription now open.

"THE COMMITTEE."

* * *

Of course, the committee is composed of the highest authorities in France belonging to the veterinary profession, Pasteur Institute, veterinary schools, etc. We regret that among the names we do not find those of intimate friends of Nocard, lovers of their profession, such as some of the members of the veterinary press, or from the army, or, again, from veterinary societies or schools of other countries, who would have exerted themselves in helping to swell the funds to be raised. But all those considerations are trifling, and may at an early date be properly arranged. The question to-day is this: A fund is to be raised; it is estimated that about five thousand ($5000) dollars will be needed. Nearly fifteen hundred ($1500) dollars have already been subscribed! Will not American veterinarians show their appreciation of the work done by one of their brotherhood, by Nocard, during his life, and will they fail to show their sorrow at the loss sustained?

All contributions addressed to the REVIEW or to myself will be duly credited and acknowledged.

* * *

I suppose that, according to the instructions on the cover page of the REVIEW, that "European exchanges, books for review, etc., should be addressed to" me, it is proper for our staff to close up our bibliographical review and for me to fulfil my duties here. Not because the material for chronicling is wanting. Oh, no! but because, after all, bibliography is not altogether in its place in a special chapter, because in that chapter the subject is not always treated as it should be, and also because, after all, authors and publishers are always anxious to know what the opinion of the reviewer is. There is no doubt that his duty is not always pleasant, and that if he fulfils it properly, conscientiously and impartially, as he should do, the task may become hard and sometimes likely to modify feelings

of friendship between author and reviewer. But such is life, and, whatever may be the result, the work must be attended to.

* * *

To-day I will try to write you a bibliographical review of French, American, and German works.

Why? Is it not a pretty heavy task? Authors from three different countries! No. The subjects treated of by the three authors are on the same topics—operative surgical technics. Indeed, we have "Operations—Cursus" of Wm. Pfeiffer, "Surgical and Obstetrical Operations" of W. L. Williams, and the "Précis de Chirurgie Vétérinaire" of P. J. Cadiot. All, with a somewhat different name, are written with the same object. The first two are for veterinary students and practitioners; the last has no special dedication.

When some years ago the exercises of Cadiot were published, when about the same time Pfeiffer's little work, and afterwards the copartnership book of Pfeiffer and Williams were issued, it seemed that the idea for such publications was rather a good one. Students were in need of a little guide, where, page by page, line by line, word by word almost, they could follow the technic of an operation and, so to speak, learn by heart the manipulations that would be required to be executed by the hands. But we fancy times are changing. The books are no longer guides; or, if they are, it is not in the same way. They are the direct and positive descriptions of the manner in which *one* operation should or must be performed, and out of this *modus operandi* there is no salvation. The technic described is the one tested by the author, and is the one he has selected as the best.

Of what uses, then, are the works on general operative surgery? Whatever descriptions they may give of a surgical operation are useless, so long as the author of the course to veterinary students does not give his sanction.

To a certain extent, however, and not to be too harsh on those who are attempting good work with excellent unselfish motives, those *vade mecums*, as I may call them, have a great

value; but their authors, it seems to me, reduce that value, or look for something else in addressing their works not only to students, but also to practitioners. I know that there is no age when one ceases to be a student, but we doubt if a practitioner of twenty, ten, five or less years can learn from the description of operations that are supposed to be at the fingers' end of every graduate of veterinary medicine at the time of his graduation, exception being allowed for those operations which are called new, and which, perhaps, have not been spoken of, written about, or demonstrated before.

But I think I am transgressing from the rights of a chronicler, and am rather too fully indulging in those of a critic, which, however, is done in good faith, and for which I tender my apologies.

* * *

Let us come back to our three works: (I) "*Operations—Cursus*," 3d edition, Prof. W. Pfeiffer. For Veterinarians and Students. It is divided into four chapters: (1) Tooth extraction, trephining, extirpation of the intermaxillary glands, ligation of Steno's duct, operation for entropion. (2) Operations on the guttural pouches, tracheotomy, intravenous injection, bleeding, ligation of the carotid, œsophagotomy. (3) Operations for cold abscess, Bayer's suture, thoracic and abdominal puncture, subcutaneous myotomy, amputation of the tail, castration of cryptorchids, removal of scirrhous cord, ovariotomy, urethrotomy, amputation of the penis. (4) Tenotomy of the flexor tendons, for springhalt, for patellar luxations, neurotomies, resection of the lateral cartilages of the os pedis, amputation of the claws of ruminants, Danish mode of casting.

The work is nicely printed and illustrated. It contains but little addition to the second edition.

* * *

(II) "*Surgical and Obstetrical Operations, for Veterinary Students and Practitioners.* By W. L. Williams, Professor of Obstetrics and Surgery in the New York State Veterinary College, Embodying Portions of the 'Operations—Cursus' of Dr.

W. Pfeiffer, Professor of Veterinary Science in the University of Giessen." The work is gotten up in fine style and printed on paper to which veterinary publications are not accustomed. It is really too handsome. The student who will consult it at the surgical laboratory, while he is learning how to perform an operation, will be afraid of soiling the thick, fine, glossy paper he is handling. Yet it is a good move. The illustrations—well, so many seem to be reproductions of those of Dr. Pfeiffer that one would think they were printed from the same plates. Exceptions, however, are those that are essentially part of the addition made by Prof. Williams to the reproduction of the third edition of the German author, from which we regret our American friend has borrowed too much.

Williams' work is also divided into four chapters, with an addition. The first contains the same descriptions and plates as Williams produced, I believe, in the first edition of his work, but he has added his operation for poll-evil, the staphilotomy of McKillip, and his own trifacial neurotomy. The amputation of a piece of the ligamentum nuchæ in poll-evil is not new—far from it, even down to the scraping of the occipital bone, and of the vertebræ; but the incision on the median line, the drain through the thickness of the occipital bone—daring—and, well, dangerous as they may be, are, we believe, good additions to the work. Of course, with the staphilotomy and trifacial neurotomy our readers are well acquainted. Prof. Williams, in his second chapter, gives us, besides those of Dr. Pfeiffer, arytenectomy and intratracheal irrigations. In the third, among the additions we find caudal myectomy for gripping of the reins. It may not be out of place to object to the severe operation here described, when one much simpler, the plain subcutaneous caudal myotomy, will answer, and I fancy the unearthing of an old operation is scarcely a progress in veterinary surgery. In chapter four we find all the tenotomies and neurotomies, past and present, resection of the lateral cartilage (German operation), with the amputation of the claws of ruminants, and Bayer's suture. Those who have performed the extraction of a

piece of any portion of the wall (not undermined), after isolating it with one groove on each side of the wall and one at the sole, will, I think, ask themselves how can the semicircular piece of horn, spoken of in the operation for the resection of the lateral cartilage, be raised, isolated, and separated from the sensitive laminæ underneath, without tearing them and rendering the aspect of the smooth and regular stitched suture of Plate XXVIII rather a difficult problem ? The last part of Williams' new work relates to obstetrical operations. I fear that I am not sufficiently competent to say anything on the subject; but I am sure it is a good part. I do not know if it is not the best, as it is essentially original, and the result of the practical efforts and observations of one who we all know is more than earnest and honest in all that he undertakes.

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(III) "*Précis de Chirurgie Vétérinaire*," by P. J. Cadiot. This is no longer a little work, although, like the preceding ones, it is intended as a second edition to the "Exercises Hippiques" that our *confrère* Bitting translated some years ago. It is not addressed to practitioners, and yet its perusal would not be without interest to them. The "*Précis*" has modified the aspect that surgical exercises had. In it all and every operation is described; nothing else is given but the technics; and yet we find, from the means of restrictions, the simple operations, the special and general operations on the head, the neck, the trunk, the extremities, etc., freely enlarging its field; and afterwards in the same way the operations on cattle, swine and dogs. To simplify this review, I will say that this book is a break between the original students' guide and the general work on surgery, enlarged for the benefit of all. Still, I believe it is a book essentially for students. For them it covers all the operations, the various methods of performing same, and on those accounts gives them a broader way to become operators. It is a new issue that I believe might be followed. To restrict those guides is an error. Why limit the teaching of the student to merely one method for a few operations only, while there

are others which, like the various sutures, the operations on the ear, on the eye, lithotrity, general operations on the foot, etc., are overlooked.

Of course the "*Précis*" is illustrated—195 plates in a book of 300 pages; some are new, others taken from previous works of the author.

* * *

Now, to resume:

We are in the presence of three good works, each having a respective value; but the one which interests us the most is that of Williams, one of our boys—an American. It is one of considerable usefulness. As I have tried to show, it contains elements which will prove essentially advantageous to those who will follow his descriptions, and we are sure it will have a warm reception at the hands of the profession. We only fear that this reception will be such and the sale so rapid that Williams will not have the time, as he should have, to prepare and complete his third edition, revised and so much enlarged by the addition of more operations that it will no longer be a simple guide for students, but one for all—a work on general surgery. I will, in the meanwhile, ask him one thing—suggest one point, as I would also to the other two writers, for their next issues. All three seem to know but one manner of performing caudal amputation, viz., with the docking-shears of our grandfathers, or the chisel, mallet and block of wood of still older days. Is there no better, more scientific, more surgical, and less brutal way? I think there is. If so, let them give it also in their next publication, even if they object to it, and let the students judge.

A. L.

A RIGHTEOUS CONVICTION.

There is probably no more injury done to the horse industry in the large cities than that which is inflicted upon owners by dishonest coachmen and, we regret to say, by some who masquerade under the respectable title of veterinarian. Happily, there are but few of the latter, but they accomplish so much in

degrading our honorable profession that their strength numerically is magnified through the enormity of their offence. An owner, trusting confidently in his supposed security from imposition when purchasing horses from dealers, by relying upon the judgment of his trusted Jehu, augmented by the professional opinion of his well-paid veterinarian, sometimes discovers when too late that he has been made the victim of a conspiracy, and that he has been mulcted to the extent of several hundreds of dollars, which have been divided equally between the conspirators. The effect upon this man is to destroy his confidence in the particular coachman whom he employed, but in the case of the veterinarian he goes further and denounces them as a class. If over sensitive, he may sell all his horses and carriages and give up a luxury which appears in his magnified imagination to be beset by dishonesty. Thus there is a loss sustained to every branch dependent upon the horse industry.

When an individual of the former class is brought to justice every honest veterinarian should rejoice, and feel that one viper has been dealt a blow that was richly deserved, and if some of those who disgrace our profession by similar practices could only receive like treatment it would indeed be the best disinfectant that could be applied to our ranks in the large cities.

A case which has brought forth these remarks has just occurred in New York. A gentleman dispatched his coachman to a neighboring city to purchase five horses for his private use. He returned with his purchases, which he reported as costing $5000, but their quality was so mediocre that an inquiry was instituted, which resulted in the discovery that the horses had been bought for less than half that sum, the dealers acknowledging having raised the receipts at the request of the coachman, whereupon the victim, Mr. E. Clarence Jones, of No. 1 Nassau Street, caused the arrest and conviction of his former coachman, one Anderson, and the court's sentence places the coachman behind iron bars for a period of five years. We cannot recall a similar case, but certainly a wide publicity to this verdict will have a salutary effect upon the gentry who levy

tribute upon all who deal with horse-owners and pass in through the stable-door. A few more such convictions (and may they include the veterinary leeches who resort to similar practices) and there will be less occasion for them.

THE INTERCOMMUNICABILITY OF TUBERCULOSIS.

THE REVIEW will begin the publication, in the January, (1904) number, of a paper entitled "Robert Koch and His Critics: A Study in the Controversy over the Intercommunicability of Tuberculosis," by D. Arthur Hughes, Ph.D., D. V. M., which very exhaustively reviews the whole subject from the time of Koch's original conclusions in 1882 down to the present year, including the deductions of the leading pathologists of Europe and America. Those who have been unable to follow this great question in all its aspects will find in this comprehensive article the facts and data necessary to place them in possession of all the steps leading up to the present unsettled state of science in regard to it. If the splendid paper read by Dr. Salmon at Ottawa, and published in the October REVIEW, is taken in conjunction with that of Dr. Hughes, the student will have before him all the salient points by which a conclusion can be reached.

CANADIAN WIT AND ENGLISH COMPREHENSION.—A big, good-natured farmer was awaiting the suburban train, accompanied by a handsome Gordon setter. Two sons of Britain stood near him. The dog strayed away from his owner, who was reading a newspaper. "Hey!" called the farmer. "Come here, Locksmith!" and the dog immediately ran to his feet. One of the Englishmen approached the farmer. "May I ask," he said "what you called that dog?" "Locksmith," said the farmer. "And why, pray?" "Because every time I kick him, he makes a bolt for the door." There was a general laugh, in which the Englishman joined. When he returned to his companion he remarked: "Most extraordinary name that man over there calls his dog." "What?" asked his friend. "Locksmith," replied the first Briton. "And why such a name?" "Because, he says, every time he kicks 'im, he runs out of the house!"—(*Farmers' Advocate.*)

ORIGINAL ARTICLES.

NOTES ON THE CLINICAL EXAMINATION OF THE BLOOD OF THE DOMESTICATED ANIMALS.*

By Samuel Howard Burnett, New York State Veterinary College, Cornell University, Ithaca, N. Y

Several years have passed since the methods and technique of making a blood examination have been simple and yet exact enough to be used clinically. The value of this subject has been generally recognized in human practice for some years now. A blood examination gives valuable aid for diagnosis in such a variety of pathological conditions that, as an author has said, "It is difficult to single out any disease in which it may not be of some utility, either as positive or as negative evidence." In the better hospitals the examination of each patient's blood is made as a matter of routine when he is admitted. Briefly stated, the clinical information afforded by a blood examination may be divided into three groups :—(1) where it gives full data for making a diagnosis, as in malaria ; (2) where taken with other symptoms it is a valuable or it may be an essential aid in determining the nature of the disease, as in deep seated suppurations ; (3) where it affords negative evidence. Simply finding that the blood is normal may be of the very greatest help.

The above refers to human medicine and surgery. Little use has been made in veterinary practice of blood examinations and those mainly in cases of diseases caused by hæmatozoa, as Texas fever and surra. It seems, however, that the clinical examination of the blood would be of even greater importance for animals than it is for man, for the practitioner of human medicine is able to make use of subjective as well as objective symptoms.

* A Paper presented at the Annual Meeting of the New York State Veterinary Medical Society, at Ithaca, Sept. 16, 1903.

With the view of aiding in making comparative clinical hæmatology of greater value, the following data concerning the blood of the more common of the domesticated animals are offered. In the course of my investigations on animal blood it was found difficult to find what had been done by the previous workers in this field. A considerable amount of valuable material is contained in articles whose titles do not indicate that they contain anything concerning normal blood. Owing to this some material may have been missed; but it is hoped that the results of the more important original investigations on the blood of the horse, cow, sheep, goat, dog, cat, pig, rabbit, guinea-pig and chicken are given. For some of these animals the examinations were made on such a small number of cases that the results cannot be regarded as final; but they will be of assistance as giving a hint as to what the normal may be.

The methods of procedure to be followed in counting the corpuscles, getting the percentage of hæmoglobin and making a histological study of the blood are given fully in the standard text-books* on hæmatology. They do not, however, give directions for obtaining blood from animals. The following method has been found to give satisfactory results.

In the smaller animals, blood is obtained most easily from the ear, generally the inner surface of the lobe. In the horse I have found it more convenient to use the side of the neck. In the cow, Smith and Kilbourne procured blood from the rump at the height easiest for the operator. The place from which blood is to be taken should be washed with soap and water,

* The more important of the text-books on hæmatology in English are:

Cabot—"Clinical Examination of the Blood." Third edition. 1898. Wm. Wood & Co., New York.

Coles—"The Diseases of the Blood." 1898. J. & A. Churchill, London.

Da Costa—"Clinical Hæmatology." 1901. P. Blakiston's Son & Co., Philadelphia.

Ehrlich und Lazarus—"Die Anæmie. Nothnagel's Specielle Pathologie." Bd. VIII. 1898. Translated by Myers. "The Histology of the Blood." 1900. Cambridge, University Press.

Ewing—"Clinical Pathology of the Blood." 1901. Lea Bros. & Co., Philadelphia.

V. Limbeck—"The Pathology of the Blood," translated from the second German edition by Latham and Nachbar, New Sydenham Society, Vol. 174, 1901.

Ewing's work is, everything considered, the most valuable of these. It contains full bibliographies of the various parts of the subject.

rinsed with clear water, then with alcohol, and dried. In the investigation referred to above in cattle, the hair was first clipped, then shaven. I have not done this with the horse as this produces a rather noticeable blemish. It was found that it was sufficient to simply part the hair and make the incision in the parting. Where blood is obtained from the lobe of the ear, a blood lancet is the most convenient instrument to use. Ehrlich recommends using a fine steel pen with one nib broken off, the other sharpened. In fact, this answers about as well as a special blood lancet. With the larger animals, horse or cow, a larger incision is necessary. A fleam, preferably a spring fleam with a rather wide blade, has been found most convenient. The incision, which should be well through the skin, may be regulated in this instrument by a set screw. In all cases the incision should be large enough to yield a sufficient amount of blood without pressure near the incision, as pressure near the wound forces lymph from the tissues and dilutes the blood, rendering a count valueless. The wound from the fleam heals quickly. After sufficient blood has been secured, the edges of the wound are held together until they adhere. I have generally disinfected the site in the horse with carbolic acid, 5 per cent. On the following day it required careful search to find the place from which the blood had been taken.

THE BLOOD OF THE HORSE.

The red corpuscles have an average diameter of 5.8μ, the extremes being 3.8μ and 7.8μ. These measurements are for fresh blood. In films fixed by heat, alcohol or osmic acid, the size is smaller than given above. The normal number for a healthy horse is somewhat above 7000000 per cmm. Sussdorf gives the normal number as 6500000 to 8000000 per cmm., the average being 7212500. Hayem gives the normal percentage of hæmoglobin as 58. Examinations that I have made give a higher percentage than this. The average of eleven different animals was 62.5 per cent. Five of these cases had less than 6000000 red corpuscles per cmm. The specific gravity is about 1060 (Sussdorf). The normal number of leucocytes is 9500 ac-

cording to Hayem. In my cases where there were more than this number it seemed to be due to a pathological condition, generally an inflammation. Five varieties of leucocytes are found in the circulating blood, namely: lymphocytes, large mononuclear, polynuclear, eosinophile and mast cells. The number of each variety has not been satisfactorily determined for normal horses. Until the number has been made out for normal animals, the following may be of use as giving a hint as to what may be expected to be found in a normal horse. In seven horses the lymphocytes had an average of about 22 per cent.; the large mononuclears 3 to 4 per cent.; the polynuclears about 72 per cent.; the eosinophiles 2 to 3 per cent.; the mast cells 0.5 to 0.6 per cent. The average size of lymphocytes is slightly larger than the red blood corpuscles, the extremes in fixed and stained films being 4.6μ to 11.0μ in diameter. Large mononuclear leucocytes were found from 9μ to 15.2μ, the average being about 11μ. Polynuclear leucocytes have an average diameter of about 12μ, the extremes found being 8.1μ and 16.4μ. Eosinophiles have about the same average diameter as the polynuclears, the extremes measured being 8.6μ and 15.2μ. Mast cells are somewhat larger than eosinophiles, the average of those measured being 1.53μ, the extremes being 11.6μ and 17.6μ.

Lymphocytes in films stained with Ehrlich's triacid stain show a well-stained, coarsely reticular nucleus of a bluish green color. It occupies nearly all of the cell, only a narrow zone of cytoplasm of a purplish tint extending around it. The outline of the nucleus is commonly circular; but may be incurved or with a notch or deep sinus on one side. With eosin and methylene blue the nucleus and cytoplasm are stained blue, the reticulum taking a deep blue color. Generally the nucleus is more deeply stained, but may be less so than the cytoplasm. With Wright's* stain the nucleus has a purplish color with a more deeply stained reticulum. The cytoplasm is a greenish blue.

*Wright— "A Rapid Method for the Differential Staining of Blood-Films and Malarial Parasites." *Journal of Medical Research*, Vol. VII (2), No. I, Jan., 1902, p. 138.

In the large mononuclear leucocytes the nucleus is oval or curved and occupies about one-half or two-thirds of the cell. Ordinarily it is situated at one side of the cell. With Ehrlich's triacid stain the nucleus has a pale bluish green and the cytoplasm a purplish tint. Both nucleus and cytoplasm are more finely reticular than in the lymphocytes. With eosin and methylene blue the nucleus is blue, but not so deep as in lymphocytes. It may have one or more deeply stained areas that resemble nucleoli. The cytoplasm is of a pale blue color. With Wright's stain the nucleus is purplish with deeper stained reticulum. The cytoplasm is of a greenish blue color. Both nucleus and cytoplasm are less deeply stained than in lymphocytes.

Polynuclear leucocytes with Ehrlich's triacid stain have a pale bluish green nucleus. The form of the nucleus varies greatly, those more often seen being spirally coiled, twisted, S-shape, U-shape or elongated. The cytoplasm is of a pale pinkish tint and contains many fine, deeply stained, purplish granules. With eosin and methylene blue the nucleus is sharply stained with methylene blue and is coarsely reticular. The cytoplasm is faintly stained with eosin. Granules are not stained except when the preparations are overstained with eosin, when they may have a bright pinkish tint. With Wright's stain the coarsely reticular nucleus is sharply stained, a purplish color, while the cytoplasm has a pinkish tinge. The granules have a bright reddish violet color.

Eosinophiles are the most conspicuous of the leucocytes whether stained or in fresh blood. When unstained the granules are refractive and have a greenish white tint. The granules are very large, much larger than the corresponding granules in other animals. They vary in size considerably, but are ordinarily 1μ to 1.5μ in long diameter. Their outline is round, oval, ovate or oblong. In the living cell undergoing amœboid movement the shape of the granules may be seen to change. The number of granules in a cell is usually from 10 to 40. Stained with Ehrlich's triacid stain the nucleus has a pale greenish color.

It is generally bi-lobed. The granules are copper colored. With eosin and methylene blue the nucleus is blue, coarsely reticular, resembling the nucleus of polynuclear leucocytes, though not so deeply stained. The granules are stained by the eosin. With Wright's stain the nucleus is purplish, resembling in general that of a polynuclear leucocyte. The granules have a rosy red tint.

Mast cells with Ehrlich's triacid stain are not readily distinguished, as the granules are not stained. The nucleus is generally bi-lobed with a thick connecting part; but is sometimes horse-shoe shaped.

With eosin and methylene blue the nucleus is pale blue, often showing a deeper stained reticulum. The granules are of different sizes, from minute dots to round, oval or circular granules somewhat smaller than the average eosinophile granule. They have a deep blue color. With Wright's stain the nucleus is pale blue, the cytoplasm a faint pink, while the granules are stained a deep purplish color.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE HORSE BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
. . . .	. . . .	. . . .	. . . .	5.5μ	Gulliver.
7403500	9500	58	. . . .	5.58μ	Hayem.
6300000	. . . .	. . . .	. . . .	5.5μ	Malassez.
7212500	. . . .	. . . .	1060	5.8μ	Sussdorf.
7215000	. . . .	. . . .	. . . .	. . . .	Trasbot.
8450000	. . . .	. . . .	. . . .	. . . .	Wendelstadt und Bleibtreu.

THE BLOOD OF THE COW.

The work on the blood of the cow has been done mainly by Smith and Kilbourne in their investigations on Texas fever. They found the normal size of red corpuscles to be about 5μ or 6μ. Bethe gives the size of ox blood as from 4.6μ to 7.2μ. Malassez gives the average diameter as 6μ. Sussdorf gives the average size as 5.6μ. Smith and Kilbourne give the average number of red corpuscles as about 6000000 per cmm. They

found that 7000000 in winter and 5000000 in late autumn seem not to be uncommon. The average number of leucocytes obtained by Smith and Kilbourne is 9730 per cmm. In the 47 animals examined they found from 5138 to 15000 leucocytes per cmm. Their counts were based on a small number of leucocytes for each case. The authors state that the figures given are only approximately accurate. I give them, however, as they give a hint as to what one may expect to find in the normal blood. Hayem gives 12000 per cmm. as the number of leucocytes for Bos Indicus.

The varieties of leucocytes as described by Hirschfeld are:—mononuclears, similar to those of the horse; polynuclears containing fine neutrophile granules; eosinophiles similar to those of man; and mast cells. The number of each variety has not been determined.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE COW BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author
6275000	. . . .	. . . .	. . . .	4.6-7.2μ	Bethe.
. . . .	. . . .	. . . .	. . . .	5.95μ	Gulliver.
8712500*	12000	57	. . . .	. . . . .	Hayem.
4200000	. . . . .	. . . . .	. . . .	6μ	Malassez.
6000000	9730	. . . .	. . . .	5-6μ	Smith & Kilbourne.
5073000	. . . .	. . . .	. . . .	. . . . .	Stöltzing.

THE BLOOD OF THE SHEEP.

The red corpuscles of sheep's blood are smaller than those of the cow. Welcker gives the average diameter as 5μ. Bethe gives the diameter as 3.9μ to 9.5μ. The number per cubic millimetre is 9133000 according to Bethe and 12090000 according to Cohnstein. Müntz gives the specific gravity of the blood of sheep as 1038. Bethe gives the leucocytes as 4140 per cmm. as normal for sheep. The varieties of leucocytes according to Hirschfeld are:—(1) eosinophiles resembling those of man, (2) neutrophiles with very fine and numerous granules, (3) mast cells and (4) lymphocytes. The numbers of the different varieties have not been determined.

* Examination of the blood of Bos Indicus.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE SHEEP BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
9133000	4140	. . . .	. . . .	3.9-5.9	Bethe.
12090000	. . . .	. . . .	. . . .	4.9	Cohnstein.
. . . . .	. . . .	. . . .	. . . .	4.79	Gulliver.
. . . . .	. . . .	. . . .	1038	. . . . .	Müntz.
. . . . .	. . . .	. . . .	. . . .	5μ	Welcker.

THE BLOOD OF THE GOAT.

The red corpuscles of the goat have an average diameter of 4.1μ (Welcker), 4.25μ (Hayem). The number per cmm. is given as 9–10000000 (Sussdorf), 19000000 (Hayem), 18000000 (Malassez). Hayem gives the hæmoglobin as 21 per cent. The specific gravity is given by Sussdorf as about 1042. The leucocytes are given by Hayem as 30000 per cmm. Hirschfeld describes the following varieties of leucocytes in the goat:—large and small lymphocytes, polynuclears containing neutrophile granules, similar to those of the sheep, eosinophiles resembling those of man and of sheep, and mast cells.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE GOAT BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
. . . . .	. . . .	. . . .	. . . .	3.9μ	Gulliver.
19000000	30000	21	. . . .	4.25μ	Hayem.
18000000	. . . .	. . . .	. . . .	3.5μ	Malassez.
9-10000000	. . . .	. . . .	1042	4.1μ	Sussdorf.
. . . . .	. . . .	. . . .	. . . .	4.1μ	Welcker.

THE BLOOD OF THE DOG.

The red corpuscles of dog's blood are given as having an average diameter of 7.3μ. The number of red corpuscles is from 4000000 to 8000000 per cmm., average 6206000 (Busch and Van Bergen). There is considerable difference in the per-

centage of hæmoglobin obtained by different investigators. Sherrington found an average of 58, while Rieder obtained an average of 117. The specific gravity is about 1060 (Sussdorf). There are about 10000 leucocytes per cmm. Busch and Van Bergen obtained an average of 9526 per cmm. Of these they found an average of lymphocytes 21 per cent., large mononuclears 6.8 per cent., polynuclears 65.7 per cent., eosinophiles 5.3 per cent. and mast cells rare. The same authors state that "there are five distinct types of leucocytes in circulating dog's blood. These are: a small mononuclear form, a large mononuclear form, a polymorphonuclear form, usually non-granular but occasionally with fine neutrophile granules, and eosinophiles with coarse, round or oval granules and a mast cell with fine, metachromatic granules." Dawson says that in normal blood there are 22 to 560 nucleated red corpuscles per cmm.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE DOG BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles	Author.
6206000	9526	. . . .	. . . .	. . . .	Busch & Van Bergen
7215000	19300	87	. . . .	. . . .	Dawson.
. . . . .	15800	. . . .	. . . .	. . . .	Goodall, Gulland & Paton.
. . . . .	. . . .	. . . .	. . . .	7.17μ	Gulliver.
6650000	10000	71	. . . .	7.2μ	Hayem.
7358000	21058	. . . .	. . . .	. . . .	Hünefauth.
7418000	11757	. . . .	. . . .	. . . .	Lyon.
. . . . .	. . . .	. . . .	. . . .	6.95μ	Manasseïn.
6123700*	. . . .	. . . .	. . . .	. . . .	Otto.
5799500†	. . . .	. . . .	. . . .	. . . .	"
7332000	8686	117	1063	. . . .	Rieder.
5578000	9438	58	1058.8	. . . .	Sherrington.
4092000 to 5644000	. . . .	. . . .	. . . .	. . . .	Stöltzing.
. . . . .	. . . .	. . . .	1060	7.3μ	"
.	12400	. . . .	. . . .	. . . .	Sussdorf.
4420000	. . . .	. . . .	. . . .	7.3μ	Tallqvist und v. Willebrand.
. . . . .	. . . .	. . . .	. . . .	7.3μ	Vierordt.
6426500	. . . .	. . . .	. . . .	. . . .	Welcker.
					Worm-Müller.

*Male. †Female.

The diameter of the red corpuscles of cat's blood is given as 6.5μ by Welcker and 6.2μ by Hayem. There is considerable difference in the number of red corpuscles given by different investigators. Hayem gives 9900000 per cmm. as the average while Sherrington finds 6857000 the average in the animals examined by him. The hæmoglobin is about 45 per cent.; the specific gravity about 1054. There is as much variation in the number of leucocytes reported as in the red corpuscles. Hayem found 7200 while Sherrington obtained an average of 14017 per cmm. Sherrington found nucleated red corpuscles in adult cats; but less commonly than in dogs.

Hirschfeld describes the following varieties of leucocytes in the cat:—(1) two varieties of coarsely granular, aurantiophile cells. (2) non-granular, neutrophile cells. (3) mast cells and (4) lymphocytes. Sherrington classifies them as hyaline, coarsely granular and finely granular and obtained the following numbers and percentages of each variety: hyaline 2751 (19.6 per cent.), coarsely granular 1173 (8.3 per cent.), finely granular 10093 (72 per cent.). In a single cat examined, Goodall, Gulland and Paton found 13500 leucocytes per cmm. A differential count of these showed the following varieties:—mononuclear 5467.5 (40.5 per cent.), polymorphonuclear 6750 (50 per cent.), and eosinophiles 1282.5 (9.5 per cent.).

TABLE GIVING THE NUMBER OF LEUCOCYTES AND PERCENTAGE OF VARIETIES.

Leucocytes.	Lymphocytes.	Large Mononuclear.	Polynuclear.	Eosins.	Mast. cells.	Author.
9526	21%	6.8%	65.7%	5.3%	rare.	Busch & Van Bergen
19300	22.17%	4.42%	64.56%	8.55%	. . . .	Dawson.
15800	18.5%	6.5%	60.5%	14.5%	. . . .	Goodall, Gulland & Paton.
9438	17%		75.%	7.8%	. . . .	Sherrington.
12400	5-10%	10-15%	70-80%	4-8%	–0.5%	Tallqvist und v. Willebrand.

THE BLOOD OF THE CAT.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE CAT BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
. . . .	13500	. . . .	. . . . .	. . . . .	Goodall, Gulland & Paton.
. . . .	. . . .	. . . .	. . . .	5.76μ	Gulliver.
9900000	7200	45	. . . .	6.2μ	Hayem.
. . . .	. . . .	. . . .	. . . .	5.77μ	Manasseïn.
6857000	14017	45.5	1052.6	. . . . .	Sherrington.
. . . .	. . . .	. . . .	1054	6.5μ	Sussdorf.
. . . .	. . . .	. . . .	. . . .	6.5μ	Welcker.

THE BLOOD OF THE PIG.

The red corpuscles of the blood of the pig have an average diameter of 6μ, the size varying from 5.28μ to 7.9μ (Bethe). The number of red corpuscles are given as 5440000 (Stöltzing) and 6960000 (Bethe) per cmm. The specific gravity is given by Sussdorf as about 1060. The leucocytes are given by Bethe as 7840 per cmm. Drake gives the varieties of leucocytes for 15 normal animals as: lymphocytes 33–77 per cent., average 56.4 per cent.; polynuclears 18–66 per cent., average 38.46 per cent.; eosinophiles 1–12 per cent., average 5.13 per cent.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE PIG BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
6960000	7840	. . . .	. . . .	5.28-7.9μ	Bethe.
. . . .	. . . .	. . . .	. . . .	6μ	Gulliver.
5441000	. . . .	. . . .	. . . .	. . . . .	Stöltzing.
. . . .	. . . .	. . . .	1060	6μ	Sussdorf.
8668200	. . . .	. . . .	. . . .	. . . . .	Wendelstadt und Bleibtreu.

THE BLOOD OF THE RABBIT.

The red corpuscles of rabbit's blood are only slightly smaller than the average size of those of man. The average given by

several investigators is about 7.1μ. There is considerable variation in the normal number of red corpuscles as obtained by different workers. Cohnstein and Zuntz found 4845000 per cmm. while Löwit obtained 7107000 per cmm. Hayem gives the percentage of hæmoglobin as 69. The specific gravity is given by Sussdorf as 1049 and by Müntz as 1046.2. The average number of leucocytes is about 10000 per cmm. The varieties of leucocytes are described by several investigators. Brinckerhoff and Tyzzer describe them as follows:

I. Lymphocytes. Nucleus circular, chromatin generally

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE RABBIT BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
5164000	7800	. . . .	. . . .	5.3-7.9μ	Bethe.
4845000	. . . .	. . . .	. . . .	. . . . .	Cohnstein und Zuntz
. . . .	. . . .	. . . .	. . . .	7.04μ	Gulliver.
6410000	6200	69	. . . .	7.16μ	Hayem.
5965000	11800	. . . .	. . . .	. . . . .	Hünefauth.
. . . .	75–8500	. . . .	. . . .	. . . . .	Kinghorn.
7107700	10720	. . . .	. . . .	. . . . .	Löwit.
. . . .	. . . .	. . . .	. . . .	6.3μ	Manasseïn.
. . . .	7537	. . . .	. . . .	. . . . .	Muir.
. . . .	. . . .	. . . .	1046.2	. . . . .	Müntz.
5637500	8752	96.5	1059	. . . . .	Rieder.
4866000	. . . .	. . . .	. . . .	. . . . .	Stöltzing.
. . . .	. . . .	. . . .	1049	. . . .	Sussdorf.
. . . .	11000	. . . .	. . . .	. . . . .	Tallqvist und Willebrand.
6031000	. . . .	. . .	. . . .	6.9μ	Vierordt.

TABLE GIVING NUMBER OF LEUCOCYTES AND PERCENTAGE OF VARIETIES.

Leucocytes.	Lymphocytes.	Large Mononuclear	Polynuclear.	Eosins.	Mast cell.	Author.
. . . .	45-55%	2-8%	40-50%	0.5-1%	4-8%	Brinckerhoff and Tyzzer.
10720	5119=47.7%		5601=52.2%		. . . .	Löwit.
7537	3034	904	3599	. . . .	. . . .	Muir.
11000	20-25%	20-25%	45-55%	0.5-3%	2-5%	Tallqvist und Willebrand.

in masses centrally arranged. Protoplasm non-granular and strongly basophile (7–9μ in diameter).

II. Large mononuclear. Nucleus oval or curved, vesicular. Protoplasm non-granular, faintly basophile (12–16μ in diameter).

III. Amphophile. Nucleus polymorphous, chromatin in masses murally arranged. Protoplasm granular; granules small, ovoid, oxyphile, may have selective affinity for acid dyes under certain circumstances (10–12μ in diameter).

IV. Eosinophile. Nucleus polymorphous, chromatin in masses murally arranged. Protoplasm granular; granules large, ovoid, oxyphile (12–14μ in diameter).

V. Mast cell. Nucleus polymorphous, poor in chromatin. Protoplasm granular; granules small, spherical, basophile, metachromatic (10–12μ in diameter).

THE BLOOD OF THE GUINEA-PIG.

The size of the red corpuscles of guinea-pig's blood is slightly larger than those of the rabbit. Hayem gives the diameter as 7.48μ and Gulliver gives it as 7.17μ. The number of red corpuscles per cmm. is about 5000000. The average percentage of hæmoglobin according to Hayem is 93. I found it to average 96 per cent. in six animals examined. The average number of leucocytes is given from 5600 (Hayem) to 12600 (Kurloff). In seven healthy animals I obtained counts of 5555 to 21897 per

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE GUINEA-PIG BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
5114000	7240			6.6-9.24μ	Bethe.
4240000					Cohnstein und Zuntz.
				7.17μ	Gulliver.
5545500	5600	93		7.48μ	Hayem.
5750000	12600				Kurloff.
5600000					Malassez.
	7400				Rieder.
5508000	12707	96			Personal observat'n.

cmm., the average being 12700 per cmm. Kurloff and Hirschfeld have each described the varieties of leucocytes found in guinea-pig's blood. Kurloff gives the the following varieties: (1) pseudoeosinophile (polynuclear) 40-50 per cent., (2) eosinophile about 1 per cent., (3) nigrosinophile (about 0.5 per cent.), (4) vacuole bearing cells (large mononuclear) 15-20 per cent. and (5) lymphocytes 30-35 per cent.

THE BLOOD OF THE CHICKEN.

The size of the red corpuscles of chicken's blood is given as about 12.1μ by 7.3μ. The number per cmm. is about 3600000. The percentage of hæmoglobin is given by Hayem as 112. The leucocytes are 20000 to 26000 per cmm. The varieties of leucocytes have not been satisfactorily described for the blood of the chicken. From the investigations of Moore, polynuclear leucocytes with spindle-shaped granules are the phagocytes and are the ones that are increased in number in an infectious disease described by him.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE CHICKEN BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Size of red corpuscles.		Author.
			Length.	Breadth.	
. . . .	. . . .	. . . .	12.08μ	7.32μ	Gulliver.
2400000	26300	112	11.5μ	7.18μ	Hayem.
3100000	. . . .	. . . .	13.5μ	6.5μ	Malassez.
. . . .	. . . .	. . . .	12.96μ	7.33μ male	Manasseïn.
. . . .	. . . .	. . . .	13.09μ	7.15μ female	"
3637000	20081	. . . .	. . . . .	. . . . .	Moore.
3860000	. . . .	. . . .	. . . . .	. . . . .	Stöltzing.
. . . .	. . . .	. . . .	12.1μ	7.2μ	Welcker.

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THE NEW YORK STATE VETERINARY MEDICAL SOCIETY has begun the prosecution of illegal practitioners, its attorney having brought several before the bar within the past few weeks.

THE KANSAS CITY VETERINARY COLLEGE has occupied its new and commodious college building, and a letter from Dean Stewart states that the school is progressing well in all departments.

THE MINNESOTA LIVE STOCK SANITARY BOARD seems to be giving excellent satisfaction and to be getting along nicely. Dr. Ward, the Secretary and Executive Officer, is credited with being a hard worker, giving prompt and thorough service and excellent satisfaction to the stock interests. Minnesota's veterinary sanitary work is now under veterinary executive control instead of being under a board of physicians with an M. D. executive.

A NEW REMEDY FOR TETANUS.—*Zanesville, O., Nov. 21.*—What is believed to be a very important discovery was made in an accidental way by Dr. J. A. Lee, a veterinary surgeon of this city, yesterday, while trying to kill a horse with lockjaw. Last Tuesday William Wells took a valuable horse to Dr. Lee's stables for treatment. The first day Dr. Lee injected eight tubes or eight cubic centimetres of anti-toxin into the animal. On Wednesday the same dose was repeated, and Thursday six tubes were administered and the horse began to improve. The next day Mr. Wells and Dr. Lee agreed that the horse could not recover and decided to kill the animal. Dr. Lee accordingly injected a dram of prussic acid into the horse's jugular vein. No change was noticed, notwithstanding the deadly character of the poison, and after waiting a while a dram and a half of the acid was injected into the horse's trachea. This was enough to kill twenty horses, but instead of dying the horse is recovering. The muscles of the jaw have relaxed and Dr. Lee believes that a permanent cure has been effected.—(*New York Herald, Nov. 22.*)

A QUESTION RELATING TO THE SERUM-THERAPY OF THE "APHTHA EPIZOOTICA."—ITS ACTUAL STATE.

By Prof. Edoardo Perroncito, Turin, Italy.

A communication made to the Royal Academy of Agriculture of Turin, at its Assemblage, May 29th, 1903, and Presented to the American Veterinary Medical Association, at its 40th Annual Meeting, at Ottawa, Can., Sept. 1-4, 1903.

Translation by Aladino A. Antilio, Philadelphia, Pa.

The serum and hemo-therapy* which, two years ago, under our direction, worked miracles in the Novara province, in the fight against the epizoötic aphtha, seemed, for a while, buried under the criticism of partisans and cunningly interested persons. But, as it always happens with things which are good and well founded, it has now arisen under better auspices.

Doubtless, it is to Löffler and Ecker that the merit belongs of having tried first of all the serum-therapy in order to prevent and fight the aphtha epizoötica on animals, especially cattle, sheep and pigs. Löffler, especially, being generously aided by the German government, has confronted the grave question for several years, and after having demonstrated certain very important properties of the "aphthous-virus" experimented extensively on the serum-therapy of the aphtha. But the immunity thus obtained from serum, being weak and of short duration, he thought for a moment to reinforce it with "serum-aphthine," *i.e.*, with serum of animals subjected to immunity, to which he added virulent lymph, directly extracted from the vesicules of the aphtha. Yet, notwithstanding this modification, the results were not encouraging; on the contrary, the practical effects, in some places, were little less than disastrous, so that the eminent experimentator returned to the study of simple serum-therapy.

* E. Perroncito: on the hemo-therapy and hemo-prophylaxis of the aphtha epizoötica, etc.

R. Acc. di Med. di Torino, adunanza del 3 maggio 1901; R. Soc. Naz. di Veterinaria, seduta del 1° giugno 1901; R. Acc. di Agric., seduta die 14 luglio 1901.

Nocard and Leclainche* epitomized these labors of Löffler in the following sentences that we are happy to reproduce: "The serum of the immunized animals possesses very weak properties, and the passive immunity conferred is of short duration."

The most active serum immunizes cattle only with the dose of $\frac{4}{10}$ of c.c. per kg. of living weight, requiring 240 c.c. for a 600 kg. cow. The refractory condition persists, on an average for 14 days only. The insufficiency of the method is evident, and it has been necessary to seek for a process of immunization both active and durable. The check of the serum-aphthine, however, has determined a return toward serum-therapy which has, at least, the advantage of being harmless. Löffler and Uhlenhuth† recognize that the prevention by serum is impractical with cattle, but they think it may be useful with sheep and pigs. They inoculate under the skin from 5 to 20 c.c. following the ages and weights of the subjects; it is recommended to raise the dose with little pigs, as they are very sensitive to the aphthous virus. The advantages of preventive serum-therapy, with small animals, are too feeble to compensate for the high expenditure of intervention. The period of immunization is too short to make sure that a single intervention may surely preserve the subjects exposed, and the repetition of the treatment is too costly to be recommended.‡

But in the issue of May 1st, 1903, of the "Recueil de Médecine Vétérinaire" in regard to the anti-aphthous serum is read: "On march 12th last, E. Nocard delivered a lecture, under the chairmanship of Foex and Magnien, General Commissioners of the Exhibition, in the buildings of the General Agricultural Exhibition, in order to demonstrate the advantages and the efficacy of the anti-aphthous serum."

* E. Nocard and E. Leclainche: Les maladies microbiennes des animaux. t. I, pag. 580, 3d edition

† Löffler u. Uhlenhuth: Ueber die schutzimpfung gegen die M. und K. Bakter. Heft xxix, p. 19, 1901.

‡ E. Nocard and E. Leclainche: Work and page quoted.

Every year, at the time of the exhibition, the animals were carefully examined as to their health. Notwithstanding this, however, during the show, the infection always appeared on a certain number of animals, and this clearly came from the fact that some owners, farmers, cow-boys or cattle traders who pass as "connoisseurs" imported the malady in germs from the locality whence they came.

It is against this danger that we must interfere.

For two consecutive years Nocard and Roux, aided by Valles and Carri, diligently continued their researches on the epizoötic aphtha, in the institute erected for this purpose at the Alfort school. But they have not yet succeeded in discovering nor cultivating the microbe which would have allowed them, doubtless, to obtain an efficient vaccine or serum.

Furthermore, they have recognized, as Löffler had done, that the serum of heated animals possesses a certain activity for immunization, but it is necessary to inject too large a quantity of serum (up to c.c. 1000). But the fact remains that such injections strengthen immunity, and the A. A. have succeeded in obtaining a serum which at the dose of 20 c.c. preserves cattle against the effects of an inoculation much larger than that which normally infects the animals. These results of the laboratory, confirmed by practice, give evidence of their importance and constitute the best criterion of their value.

Unfortunately, however, the anti-aphthous serum-therapy which has immediate immunizing action, lasts only a fortnight. Furthermore, it is impossible to utilize this method in cases of epizoösis, for the dose of 20 c.c. ought to be injected in every beast every 15 days, necessitating an enormous quantity of serum.

But as far as exhibitions are concerned, the services rendered by such inoculations are more than sufficient and practical, for, in this way, the owners and the traders avoid the danger of receiving back their cattle, infected by epizoötic aphtha.

As I have already said, Löffler, in one of his reports dated 1901,* has signaled a new process to obtain, in the cattle, an

* Löffler: *Berl. Thierarztliche Woch.*, March 28th, '03.

immunity of a certain duration against the epizoötic aphtha.

This method consists in the intravenous inoculation of old lymph, become inactive by having been preserved in a refrigerator. This lymph was mixed in the dose of $\frac{2}{10}$ of c.c. with $\frac{1}{10}$, $\frac{2}{10}$ up to $\frac{3}{10}$ c.c. of new lymph, exposed for 5′ to the temperature of 60° C. in order to kill the germs.

The animals thus vaccinated, being placed in an infected stable, remained, in the greater part, untouched from a week and a half to three weeks. Those which contracted aphtha, after 10 to 14 days, presented an eruption of benign nature in the mouth and on the tongue. The results would therefore be apparently satisfactory; however, the experiments made had shown: (1) That immunity manifested itself only after a given period. (2) That the lymph reached too high a price in proportion to the immunity produced, which was not sufficient to prevent the development of aphthous epizoösis in a determined region.

These considerations had induced Löffler to abandon for a moment the trodden way, and direct his researches to the discovery of a serum which could prevent infection.

Each of four calves was inoculated directly into the vein with $\frac{1}{10}$ of c.c. of fresh and very virulent lymph. As soon as the temperature had reached 40° C. (in less than 22 to 30 hrs.) there were inoculated in the same way 20, 50, 100, 200 c.c. of serum taken from a cow already treated by progressive doses of lymph. The first two, which had respectively 20 and 50 c.c. of serum, contracted a benign form of epizoötic aphtha, while the other two which had 100 and 200 c.c. of serum remained completely untouched. Encouraged by this experiment they produced the intensified immunization of cattle which were to serve for the preparation of serum, by progressive doses of lymph. To this end they used lymph obtained from cultures upon young pigs, which are very well adapted for such work.

The serum taken from cattle was tried with success on other cattle. The dose established was 75 to 100 c.c.

Now, with this dose, he obtained, in most of the animals,

such an immunization that they remained untouched for more than a month, in infected stables.

Some had the disease still, but in a mild form.

From 200 c.c. the dose was lowered to 60 c.c., then to 50 and 20 c.c., but these two last doses have not been proved surely preventive, and nearly half the animals inoculated, contracted the disease. Yet, encouraged by these results, Löffler started to study practically the immunizing effects of this serum. A series of aphthous epizoösis allowed him a good chance, and in his report of 1901 he was able to formulate this conclusion. Now, it is almost safe to affirm that the new bovine serum furnished a practical medium by which we may henceforth fight and overcome this pest. However, it is necessary still to continue the studies with the serum in question, and to try, above all, its efficacy on the malignant forms of opizoötic aphtha, which cause so many losses to the breeder of South Germany.

Evidently Löffler had not yet known of our labors, otherwise he would have seen that even in the cases of aggravated and malignant aphtha, the question of serum-therapy or hemotherapy was solved. It will be sufficient to read the new work already quoted, "on the hemo-therapy and hemo-prophylaxis of epizoötic aphtha" in order to be thoroughly persuaded. Our studies which resulted so fortunately in 1901 were performed essentially on an epizoötic aphtha. In 1902 Löffler, starting from the observed facts, sought to determine the degree of immunity conferred to cattle by the established dose of 100 c.c. of serum, *i. e.*, the quantity of virulent lymph the cattle would be able to stand when subjected to intravenous injection of 100 c.c. of serum.

This dose was supposed, practically, to confer immunity to nearly all bovines, against epizoötic aphtha.

To this end he chose a series of cattle of nearly the same weight and development; to each of these he injected 100 c.c. of serum, and after 24 hours he subjected them to a gradual injection of virulent lymph, so that to some he inoculated $\frac{1}{100}$, to others $\frac{1}{50}$ or $\frac{1}{20}$, $\frac{1}{10}$, $\frac{2}{10}$ and $\frac{3}{10}$ c.c. Thus Löffler established that

the best serum neutralized the virulence of $\frac{2}{10}$ c.c. of lymph. This is indeed an enormous dose of virus, when we think that, generally, $\frac{1}{2000}$ and even $\frac{1}{4000}$ of virulent lymph is enough to infect a cow in health, even acting on a desquamated epidermic surface, with subjects slightly contaminated. And if the vaccinated animal is placed near a sick one, with large aphthæ in its mouth, especially on its tongue, calculating that the quantity of virulent lymph produced and spread by the saliva of this last may be elevated to several c.c. it is useless to remember that, in these circumstances, the 100 c.c. of serum will not confer to the vaccinated animal such an immunity as to be able to resist the infection which endangers it. From this come the ill successes registered in the course of vaccinations performed in 1901. On the contrary, these very same experiments have shown that repeated doses of serum, less than 100 c.c. and reduced even to 20 c.c., confer immunity to the animals in a stable doubtlessly infected, on the condition that it be sought to prevent the direct infection of the vaccinated cattle, through water, feed or virulent saliva, and that the vaccination be performed before the infection happens through the saliva.

Experiments still under way have the object of possibly verifying if doses from 5 to 10 c.c. of serum be sufficient to immunize cattle against the natural infection due to a weak quantity of lymph. The researches of Löffler have evidently a great practical importance. In the fight against aphtha he recommends the compulsory vaccination of all cattle admitted to the markets, and for all those coming from foreign parts or from an infected centre. From Löffler's exposition it is clear that the creation of a special institute for the preparation of a serum which may be sold at low prices would be the needed corollary of this sanitary innovation, which he thinks simple and of easy realization.

And I fully agree with this conclusion, for without a centre of production of serum, or hemo-aphthine, both owners and veterinarians would remain in the same actual position, in which they do not know where to turn, not only to prevent, but even to

rationally treat their cattle against aphtha. The cases of malignant aphtha, happily cured with hemo-aphthine, were very numerous in the Novara province, being initiated by myself and continued under the direction of Drs. Bono and Tubasso, as reported in their special publications.

The hemo-aphthine is prepared with the blood of cattle repeatedly inoculated or aphtho-ized with lymph or materials of infected animals, or, better, with blood of cattle which have overcome aggravated or malignant aphtha and which possibly have been reinoculated several times with aphthous virus (lymph gathered from vesicles of the aphtha, diluted or undiluted with physiologic salt solution passed through a Chamberland or Berkefeld candle) in order to obtain saturation of the organism, as is done in the preparation of the serum against charbon or hemo-anthroxine, which for some time has been prepared and experimented with successfully in cattle, in cases of mortality, before or after the charbonous vaccination, when this is practiced while the charbonous epizoösis is already manifested.

The blood of animals immunized against aphtha is defibrinated gradually, while it is being aseptically collected by means of an incision or by collecting the blood of the animal which is slaughtered, and filtered through aseptic absorbent cotton, while from 3 to 4 per cent. of sulphuric ether and 0.75 per cent. of formalin (as it comes from the pharmacies) are added to it. Thus, the liquid immunizing preparation, called by me hemo-aphthine, may be kept for a long time, and is used in subcutaneous injections in the proportion of 1 or ½ c.c. (or even less) of every kg. of net weight of the animal. That is to say, at the dose of 20, 50, 100, 200, 300 gm. per head according to the weight of the animal to be inoculated, and the degree of preparation of the animal which has served for the production of the hemo-aphthine. And, now, a few practical illustrations, which I take from my preceding special work, published in 1901, and already referred to in the margin.

On April 3d, 1901, Senator Faroggiana had invited me to

visit his farm of Castellazzo, where there were 80 cows, 2 bulls, and some calves, attacked by grave aphtha seven days before, *i. e.*, on March 27th.

On April 1st a cow had died, on the 2d another, on the 4th four others, and during the nights of the 4th and 5th two more had died. I proposed without delay to inoculate the new preparation, hemo-aphthine, and on the evening of the 5th with Dr. Del Bono, sanitary officer of Novara, and with the veterinary doctors Bertone and Binotti, and with the sanitary guard, we went together to Castellazzo, to the farm.

There we chose 28 cows, more gravely stricken, and we subjected them all to the inoculation of the new preparation, hemo-aphthine, to be compared with the others which had a more benign aphtha and were diligently treated by the ordinary methods. The injections began at 20.35 o'clock (*i. e.*, 8.35 P. M.) of the 5th and ended about 2 A. M. of the 6th. The results thus obtained seemed a revelation, for the cows which had not eaten for eight days immediately began to eat, some of them only 30 minutes after the inoculation, and the improvement was relatively so rapid that it aroused great enthusiasm among the farmers, who had been frightened by the terrible pest.

Since then, we continued the inoculations with other material prepared in the same way, and in the same proportion, upon the other infected animals.

Signor Malinoeni, of Collobiano Vercelles, who had a stable with about 100 cattle, had already lost 40 cows, 6 young cows and 8 calves. Of 24 cows stricken, 6 had recently died : 2 on April 5th, 2 on the 6th, 2 on the 7th. Of 16 calves stricken 6 had died also. After the injection of hemo-aphthine in the established proportion, *i. e.*, about 300 gm. for the cows, and 75 to 100 gm. for the young cows and calves, we noticed here also the quick resumption of the eating process, vivacity, and entire health, within a few days.

At St. Bartholomew, of Vercelli, of more than 25 cattle, 6 had already died, 2 cows on the 10th and 11th, 2 on the 12th, and one on April 14th, 1901.

The 19 young and old cows subjected to inoculation of proportioned doses of hemo-aphthine, were all cured in a short time, with the exception of a cow gravely affected with tuberculosis, which afterward was sent to me at my laboratory in Turin, and served for experimentations and studies. On the same evening of the 14th, with Drs. Tambornino and Borge, veterinary doctors of Vercelli, I inoculated also 6 healthy cows of the same proprietor, placed in a healthy stable, at the end of the yard of the same farm, with 300 gm. of liquid, leaving full liberty to the persons to go in the stable where the cows were kept.

None of them contracted the disease any more; therefore, they were regarded as immunized against the very malignant aphtha, due to the common means of contamination, as those alluded to by Löffler, and which, as they had been ignored by him, he would still experiment and study.

In that stable I had also the occasion to make an important observation relative to immunity. The stable, very roomy, comprehended two parts, communicating with each other, only divided by the entrance door (right and left) so that the left contained the cattle belonging to the proprietor, 25 in number; the right those of a Lombard gentleman of Bergamo, coming from the province of Como, near Lecco, from Val Sassina. The cattle of the proprietor which had not yet had aphtha, were all gravely infected, and had the losses already indicated. The cows of the Lombard gentleman, numbering 40, which had aphtha last year, remained perfectly immune, while 16 young and old cows which had not yet suffered from aphtha and were mixed among them, contracted the disease and 2 died. Therefore, also, the remaining were inoculated with a curative dose of hemo-aphthine, with perfect success.

Dr. Tambornino, veterinary doctor of Vercelli, had made trials of immunization, using hemo-aphthine which I supplied.

He proceeded in his experiment as follows:

Having chosen two cows from a well-known healthy stable, after a day of rest in a disinfected room of the slaughter-house, he inoculated them under the skin with a gramme of hemo-aphth-

ine for each kg. of weight of the dead animal, deducting the intestines, as I had suggested to him. Eight days having elapsed, and having already established the normal temperature of the two animals, on the ninth day he proceeded along to the aphthosation by means of saliva and secretion taken a few hours before from various cows, among the most gravely stricken with malignant aphtha on a farm a little distance from Vercelli.

Four days later the symptoms characteristic of the disease were manifested in one, and six days later in the other. In both, however, the disease was of a benignant form. The two beasts continued to eat hay, notwithstanding they presented aphtha at the mouth and feet, and without any care they were quickly healed. Evidently the hemo-aphthine did not produce a complete immunization, which, however, was overcome only by a great quantity of virus artificially inoculated by the aphthosation process.

Now, by the researches of Löffler we can explain why Dr. Tambornino could not obtain the complete immunity in the two animals on which he experimented, and why, on the contrary, it was obtained in my trial made at St. Bartholomew, of Vercelli, on the six cattle not yet affected by aphtha.

In that same memorandum, Dr. Tambornino described the excellent results obtained in the cure of the malignant aphtha by means of the same hemo-aphthine, on more than 150 head of cattle, of different ages.

For all this, it seems to me that the time has already come when the greatest impulse must be given to the serum-therapy of the epizoötic aphtha, or better, to the hemo-therapy, in order to obtain a material of easier preparation and cheaper too, especially in our country, where the aphtha is making such frequent appearances, followed by great damages.

Dr. L. Van Es, professor of Veterinary Science in the North Dakota Agricultural College at Fargo, successfully underwent the classical operation for appendicitis during the past summer.

ANTHRAX AND BLACK-LEG.

By Charles H. Higgins, B. S., D. V. S., Pathologist, Dept. of Agriculture, Ottawa, Canada.

A Paper presented to the 40th Annual Meeting of the American Veterinary Medical Association, at Ottawa, Can., Sept. 1-4, 1903

The title of my paper was not selected on account of its scientific value, nor on account of any original work accomplished by the writer in connection with either affection; but, rather, with a view to giving a comprehensive idea of the differences between these two affections to the general practitioner, which will enable him to more easily make a correct diagnosis, thereby causing a financial gain, not only to himself, but to his client as well.

Some criticism may be offered at the commonplace term used ("black-leg"), but I consider this advisable, owing to the idea which has gained ground in some sections and I am sorry to say by some professional men, that the two diseases are similar in their nature and the methods of inoculation for their prevention.

The history of either disease can be traced back through the preceding centuries with little difficulty, even though the exact nature of their causative agent was an unknown quantity.

At the present time, through the perfection of our microscopes, we are able to detect the infective agent, not only of these two diseases, but the infective agent of the majority of the contagious diseases of man and animals. It is then apparent that we are indebted to the perfection of our microscopes, not only for the detection of the infective agents of the contagious diseases, but also for our present knowledge of their prophylaxis and preventive treatment.

To deal progressively with these two affections, I will cite circumstances which the country practitioner is liable to encounter in the regular routine of his practice at any time.

His services are required immediately, some cattle are dead, others are in a dying condition, the owner or owners are ex-

cited, and from the quick onset of the disease and the almost total absence of symptoms, immediately suspect poisoning by a near neighbor with whom they are at loggerheads.

A careful and quick diagnosis is imperative, not only for the protection of the other animals on the farm, but, if the case be anthrax, for the protection of the human beings who may come in contact with the animals or their products after death.

In anthrax, the diagnosis may be established by the short duration of the illness ; the animal may be of any age or variety ; as a rule, appearing in perfect health the night before, and being found dead or nearly so in the morning. There is usually a bloody discharge from the nostrils and anus. This in itself should arouse suspicions and make one particularly careful in handling the carcass, that he may avoid infecting himself or others, or distribute the infection over the ground when removing the carcass to a suitable place for burial. If there is still doubt, a few drops of blood may be obtained on a clean piece of note-paper, allowed to dry in the air before being folded, and forwarded by mail to a laboratory for microscopic examination, which examination will yield positive results.

If it is necessary to confirm the diagnosis immediately, an autopsy may be performed, but it must be borne in mind that this is a very dangerous procedure and one which can usually be dispensed with even in the most remote sections.

At an autopsy on a case of anthrax, hæmorrhages will be noted throughout all the tissues and organs of the body. The spleen will be greatly enlarged and very dark in color. The blood flows freely, is of a dark color, tarry, and does not coagulate.

The carcass of such an animal should be destroyed by fire as soon as the diagnosis is made or suspected, care being taken that all discharges and litter about the animal be burned with it, even to the halter. The animal should, under no consideration, be skinned, as this is a most dangerous procedure ; nor should it be dragged over the whole farm with a chain around its neck or leg that a spot may be found where the digging is

easy, for by this means the infection is very effectually spread, contaminating any enclosure through which the animal may be drawn.

Black-leg is a disease of the ox and is seen more often in animals from six months to four years old. Its onset may be slightly longer than that of anthrax, the first symptom usually being lameness. Later an emphysematous condition of the skin covering the muscles is noticed, which gives an increased size to the quarter affected and a crackling sound similar to the rustling of paper when the hand is passed over the area.

As a rule, there is no discharge from any of the natural openings of the body, of a bloody character. The blood is coagulated and of normal color. The spleen is normal. Congestion of the intestinal mucous membrane is at times present and there may be some hæmorrhages.

The skin covering the lesions is dry. The muscles are dark in color and decomposition takes place very rapidly.

The precautions taken in the handling of the carcass should be similar to those used in case of anthrax, although the danger to human beings is nil, but the danger of spreading the infection is as great.

With this disease, as with anthrax, there should be no difficulty in making a positive diagnosis in the field, but if it is desired to confirm the diagnosis, a few drops of bloody serum from the affected muscles, prepared in the same manner as blood from a case of anthrax, will yield positive results on microscopic examination.

Bacteriologically, the difference between the germs of anthrax and black-leg is as great as the difference in their lesions.

The anthrax germ is ærobic (*i. e.*, grows only in the presence of oxygen), non-motile organism, a characteristic being the chain formation in artificial media or in the tissues.

The germ causing black-leg is anærobic (*i. e.*, grows only in the absence of oxygen), and is actively motile. Chain formation is not a characteristic.

Both germs form spores, which spores are capable of retaining their infective properties for an indefinite length of time. Either germ is easily propagated provided suitable media and conditions are observed. Anthrax is easily stained, retaining the dye when treated by the Gram method. Black-leg bacilli are also easily stained, but do not as a rule retain the dye when treated by the method of Gram.

An opportunity for the treatment of animals affected with either disease is seldom obtained, and when such an opportunity is presented, it is usually fruitless.

The preventive inoculation against both affections is widely practiced, particularly in localities where it is known the infectious agent exists. The attenuated virus for the preventive inoculation is prepared in laboratories especially equipped for the work, of which there are many on this continent, some connected with the Federal or State governments, others connected with firms who make a specialty of "biological products."

These vaccines when prepared with care and properly tested may be considered reliable. Anthrax vaccine as prepared requires two inoculations, the first preventing against infection by the second, and the second preventing against infection by a virulent germ. The interval between the two inoculations varies, but is usually from ten to twelve days. Black-leg vaccine is sold in two forms, the single and the double vaccine. The single vaccine is usually recommended for grade stock, while the double is for pure-bred animals; it being considered that a single vaccine which will act as a preventive against an active infective agent, is too strong for pure-bred animals, which are considered more susceptible, owing to their high breeding. The results of vaccination against either infective agent are considered successful. The method of applying black-leg vaccine is various and is usually characteristic of the manufacturer, each firm desiring to obtain a method which is very efficacious and simple that it may be placed in the hands of the layman as well as the veterinarian. The results of vaccination against either infective agent, are considered successful.

THE BANG SYSTEM FOR ERADICATING TUBERCULOSIS AS PRACTICED AT PINE GROVE STOCK FARM, ROCKLAND, ONTARIO.

By Hon. W. C. Edwards, Proprietor of Pine Grove Farm.

Read on the occasion of the Visit of the American Veterinary Medical Association to Rockland, Sept. 2, 1903.

I have been asked by Dr. Rutherford, Chief Dominion Veterinary Inspector, to read, on this occasion, a paper on the Bang System for the eradication of tuberculosis as practiced on our farm here. This is a subject more properly to be dealt with by a professional man than by a layman. However, if in what I have to say on the subject I express opinions which may be at variance with the accepted theories and practice of the profession, I am fully aware that the consideration due to a layman dealing with such a subject will be accorded me by the profession, and before launching out to give expression to our experience and my views upon this most important subject, allow me to express the great pleasure and gratification it affords me to see here to-day this assemblage of so many members of the veterinary profession from all parts of the United States and Canada, as well also as the medical men and others who are interested in the promotion of the health of our animals, animals so closely allied with human life.

Referring to the close alliance and association between human beings and domestic animals, and recalling the statement made by the great German scientist, Dr. Koch, something about two years ago, the question of tuberculosis in our domestic animals would appear not to have the same significance as affecting human beings as was formally generally supposed. The relation or similarity as between human and bovine tuberculosis and the communicability from the one to the other is, however, one for scientific and professional men to thresh out. I will not presume to express any opinion on this complex question. I will be permitted, however, I am sure, to say that for myself I regard the safest course, while doubt still remains, is to allow

the doubt to rest on the side of the greater security and to continue to assume that there is danger until it is uncontrovertedly proven that there is no danger of human beings contracting tuberculosis in various ways from domestic animals so diseased. But even if, finally, it is proven that the disease is not communicable from animals to men, there is no reason why the efforts being made for the eradication of the disease in our animals should be stayed for a moment. In our best interests, having regard to the animals only, it is most highly desirable that the disease should be eradicated. It is to be found to the greatest extent in our pure-bred herds, the source from whence sires are obtained for the general improvement of the herds the world over, and unless our pure-bred herds are cleansed of the disease, the process of spreading it will go on until it pervades the entire live-stock interests of each country where it is not eradicated, and the extent to which it will be injurious to the live stock of each country will be measured by surrounding conditions, and the loss of animals will be measured largely by the general sanitary or unsanitary and other conditions prevailing, so that, regardless of the matter of the danger to human life, it is highly in the best interests of the stockman that his herds and flocks should be free of disease of every nature, and the question arises: Can tuberculosis, one of the most constant diseases present in our animals, be eradicated? My answer is "YES," most emphatically. It can be done, and once eradicated, by reasonable care, healthy herds and flocks in this respect can be maintained, and the system we recommend is the Bang System, which has been rigidly practiced on this farm since the year 1898. In the spring of that year, intending to ship some young bulls to Wisconsin, we asked our Dominion Veterinary authorities to test them, and to our surprise and regret it was found that all responded to the tuberculin test. This was our first knowledge of the existence of the disease in our herd. For a few days we were undecided what course to pursue, but on consultation with the Hon. Sydney Fisher, our Minister of Agriculture, who recommended testing the whole

herd, and who further urged upon me the advisability of adopting the Bang System for the eradication of the disease, and on our consenting, he at once placed us in communication with Dr. McEachern, the then Chief Dominion Veterinary Inspector, who immediately had the entire herd tested, and gave us full information and instructions as to the Bang System. The greater part of the herd responded to the test, and a separation was at once made of the healthy from the diseased animals. The decision was to weed out and kill all but animals of desirable pedigree and individuality, and the slaughtering took place under veterinary inspection. Of the fifty to sixty animals slaughtered, only three proved unfit for human food, but in all traces of the disease, in a more or less degree, were found, but, in most cases, very trifling traces of it. The stables formerly occupied by the herd were most thoroughly disinfected for the reception of the healthy animals, and entirely new premises were erected for the diseased animals we retained in our herd, and in like manner the diseased animals have been kept in separate and distinct pastures from the healthy ones since that time and have never mingled in any way.

In the inception of our experiments, we sterilized the milk from the diseased cows, as directed by Dr. McEachern, and fed the calves with the pail. This plan we found successful in so far as raising sound calves was concerned, but it is a somewhat troublesome one, and, further, we lost a few calves, as we believed, from the fact that they were so fed at once without first taking the mother's milk in the natural way. This plan, while successful, we have discarded entirely, and we have adopted the plan of raising the calves on nurse cows, allowing the calf always to suck the mother once before making the change. This plan we found most successful in every particular, and in the practice of either of these plans described, we can vouch for it from our experience that healthy calves can be most successfully raised from diseased dams or diseased sires and dams, and if all is carefully carried out, the percentage of diseased calves raised will be very small indeed, so small that it need hardly be con-

sidered. In our experiments, everything has been entirely satisfactory to us, and we strongly recommend the practice to our brother breeders, many of whom, we are sorry to say, have, up to this time, resisted the advice in this respect of our veterinary authorities, both in the United States and Canada, and the subject has been a most controversial one. We can only say, for our part, that after a very considerable experience we are firm believers in the Bang System, and we are believers in the tuberculin test as the only present means, so far as we are aware, of ascertaining the existence of the disease. The only failure, so far as we have knowledge of, is in cases where the disease is in such an advanced stage that reaction does not take place. In a well-conducted herd, such cases will be few and far between. Further, we have experienced none of the unfavorable results that are put up by those opposing the test. In no case have we known, in the many hundreds of animals we have had tested, of any injury to any animal, neither have we experienced any trouble in abortion in cows tested, and we have had them tested at all stages of pregnancy.

We are firm believers in the tuberculin test, as we have described, and we are also firm believers in the Bang System, and until these are improved upon—if they can be improved upon—we shall practice both in the management of our herd. No matter what the practice and requirements of our Government authorities may be, we, on our part, shall not relax our efforts in the direction I have stated until all our herds are absolutely free from the disease, and until better means are known, we shall always use the tuberculin test to ascertain the conditions of the health of our herds.

Having given our practice on this farm, I may now be permitted, perhaps, to make a few general remarks. The discovery of the extent of the disease in the herds of various countries a few years ago caused such a commotion that most rigid enactments were passed by several legislative bodies; extreme conditions were imposed, doing, unfortunately, in our opinion, a great deal of harm, arousing the antagonism of breeders and

stockmen. Much of this legislation has been rescinded, and more reasonable measures are now adopted as a result of a greater knowledge of the subject. Mistakes, if there have been mistakes, were not wilful, but well intended, on the part of the authorities of each country, but we submit that if the disease is to be eradicated from any country it must be through a campaign of education and united effort on the part of the breeders. The exclusion of importation will never help just so long as the disease exists in the herds of the importing countries, and our veterinary authorities will do well to show the simplicity with which it may be eradicated, rather than impose unnecessary conditions. Apart from the test and the application of the Bang System, cleanly and sanitary conditions, good ventilation and plenty of sunlight, and as much outdoor life as possible, are the requisites. To the beginner in stock-breeding, we would advise that he begin with animals free from disease and that he attend well to his ventilation and sanitary conditions, and if at any time he buys to strengthen his herd, to see to it to a certainty that he does not buy disease with the animal. To the breeder, small or large, who discovers the disease in his herd, if the animals are of inferior pedigree and individuality, we recommend turning off to a butcher to be killed under veterinary inspection, all animals that respond to the test, but in no case would we recommend the slaughtering of valuable animals where they are still in good breeding form, but we advise the system of separation. The same measure of separation may not always be possible, but the best that can be done should be done in each instance, and do not neglect the sanitary matters spoken of in this paper. I am fully convinced of the reasonable possibility of the eradication of tuberculosis from our herds and of the maintenance of sound herds, and my earnest hope is that our breeders may at no distant day be so educated in the direction I have endeavored to describe that they will put into practice the only present known means of ridding their herds of a disease which in the past has been so destructive in its consequences.

THE "CRAB" OR "FORGER."

COMPETITION FOR THE PRIZE OF TWENTY-FIVE DOLLARS OFFERED BY DR. WM. DOUGHERTY.

FIRST PAPER.

BY NO. ONE.*

In the October number of the REVIEW Dr. Wm. Dougherty offers a prize for the best essay on forging, dividing the subject under two heads:

(1.) Is the horse sound? Meaning, we will suppose, Is forging unsoundness? We will answer, no. While an unsound horse may forge, it is incontrovertible that many sound horses do forge. This being true, forging cannot be considered unsoundness.

(2.) Where is the lesion? We deny any pathological condition existing. Therefore, will not pursue this division further.

A somewhat extended experience on the road and track leads us to the conclusion that forging is either a fault of disposition or conformation; often both combined. Most forgers do so at the trot. We will treat of the fault at that gait. The horse is a very complicated piece of machinery, which for convenience we will regard as having the form of a parallelogram having a pendulum at each right angle. As with the horse at the trot an anterior and an opposite posterior pendulum oscillate at the same instant. The range of the pendulum's oscillations being greater than the length of the body, each posterior pendulum must pass its corresponding anterior one at some point of each oscillation or they will collide. This may be accomplished in one of two ways. Either the pendulums must vary from a true line to allow them to pass or the anterior must rise enough to allow the posterior to pass under. We have this same problem of passing the limbs at the trot. In low-gaited animals this is attempted at or near the ground and in case of

* The identity of the author remains the property of the editors of the REVIEW, until the judges have rendered their decision, the merits of the various papers to be decided upon by numbers only. For conditions of competition see October REVIEW, page 628.

interference causing their shoes to strike, called "forging." In the higher acting horse the interference comes after the anterior limb has completely left the ground and is then called "speedy cut," and may occur at any point from the coronet to high on the cannon bones. In the symmetrical trotting gait the anterior limb would be elevated at the instant the posterior limb was descending, thus leaving the body for an instant suspended in the air at each stride. The abductor muscles would rotate the posterior limb outwards and the adductor muscles would rotate the anterior limb inwards, thus passing them safely and producing a frictionless gait. Low, heavy-headed horses are very apt to forge when extended. Many horses forge from heedlessness. Again, many road horses forge only when weary. Others forge only when jogging, going clear the instant they are extended. Bad shoeing may be the cause of forging by changing the length and direction of the stride. There is not space in an article of this kind to give a remedy for the different kinds of forgers, and this paper was to be confined to etiology; but will venture that the majority of forging horses are in the hands of slack-rein drivers.

* * *

SECOND PAPER.

By No. Two.

For a proper and comprehensive explanation of this defect in the horse's gait, the task is rendered difficult through the allotted space, and more so through the questions, which hardly have any relation to this abnormality whatever. Our literature on this subject is very meagre, and to my recollection we find only some description of it with its shoeing in the books on "Horseshoeing," by Gutenacker, Lungwitz, Dominik, Teuch, Lesbre, and others.

Soundness has to be taken in consideration first, which should have been mentioned either in the second place or in the *résumé* only, if at all, after pointing out the different causes. Then, generally speaking, we have to understand under a forging horse a sound animal, because there is no diseased condition

of any part, and the few instances where forging is the result of disease, lameness or overwork, we easily can overlook, as in these cases forging only will be temporary and disappear with the improvement of the animal's condition.

After stating why a forging horse has to be called sound, we come to the second point, the location of the anatomical lesion, for which expression Mr. Dougherty should have said, defect from the normal of the anatomical structure, which would have been more to the point and more correct, and made the work easier for the essayists. But, as it is, we have to call a lesion wherever there is a deviation of the outlines of a perfectly normal horse; in this case a lesion or discrepancy rather in the conformation of legs and body.

For instance, the body is too short in proportion to the length of the legs (or the legs too high for the length of the body), "too much daylight under the horse," as it is commonly called. Further, a horse is apt to forge, if the foreleg stands too far backwards and the heel consequently has to bear too much weight of the body, or the position of the hind foot is nearer the point of the body's gravity than it ought to be.

So far, I have mentioned the causes which lie in the natural condition of the horse's faulty formation; besides I dare not forget to say that forging comes from badly prepared feet by the shoer or wrong shoeing. In one case the blacksmith might cut the heels too low or leave the toe of the front foot too long, and *vice versa* with the hind foot; also the shoe of the front foot might be too long and extend too far back, or ill fitting, by being too wide.

By summing up all these points, we have to state that forging is not a question of soundness, but an abnormality in the horse's gait, resulting from improper proportions of the different parts to each other in the anatomical conformation, or from unscientific shoeing.

THE VALUE OF ANTISEPTICS IN DESTROYING THE VIRUS OF RABIES.

By Richard Price, V. S., St. Paul, Minn.

Read before the Minnesota State Veterinary Medical Association, July, 1903.

The usual course pursued in treating dog-bites in people is to cauterize either with stick silver or actual cautery. Only in cases of superficial wounds or mere abrasions of the skin can such treatment be of much value.

As will be shown further on, the destructive power of caustic silver and carbolic acid on the virus of rabies is very weak, and as these are the remedies mostly applied it is no wonder so many die from hydrophobia after imaginary security procured by such treatment of the wound.

In animals, dog-bites frequently extend subcutaneously for many inches beyond the points of puncture produced by the tusks, in the skin. Recently a fox terrier was brought to the infirmary with a lame leg caused by the bite of another dog. Only two punctures were visible, one on each side of the arm near the elbow; on probing it was found that the wound extended to the carpus, a distance of four inches or more. How does this happen? The only solution to the question I can give is that the skin being loose, and the connective tissue elastic, the tusks tear through the more delicate subcutaneous tissues, lacerating them but not the tough skin beyond the punctures.

In treating wounds produced by dog-bites, first anæsthetize the parts with eucaine solution, or other similar preparation, then dilate the sinuses, if any, by injecting a solution of hydrogen dioxide, to render discovery of the extent of the wound easier; then flushing the wound out repeatedly with one of the following antiseptics in appropriate solution, as they have been proved by Italian and other investigators to be the most potent to destroy the virus of rabies: Lemon juice, creolin, ferric perchloride, hydrochloric acid, etc.

Furthermore, fluids are much more likely to reach the deeper parts of a wound than either stick caustic or the actual cautery.

The value of antiseptics in destroying the virulence of rabic virus is given as follows:

Lemon juice destroys it in 3 minutes.
Creolin (1 per cent.) destroys it in 3 minutes.
Ferric perchloride (2 per cent.) destroys it in 5 minutes.
Sulphate of copper (10 per cent.) destroys it in 5 minutes.
Cinnamin destroys it in 5 minutes.
Hydrochloric acid (5 per cent.) destroys it in 5 minutes.
Nitrate of silver (50 per cent.) destroys it in 5 minutes.
Nitrate of silver (saturated solution) destroys it in 5 minutes.
Nitrate of silver (25 per cent.) destroys it in 10 minutes.
Caustic potash (saturated solution) destroys it in 10 minutes.
Liquor ammonia destroys it in 10 minutes.
Sulphuric acid (10 per cent.) destroys it in 10 minutes.
Iodol destroys it in 10 minutes.
Boracic acid (4 per cent.) destroys it in 15 minutes.
Iodoform destroys it in 20 minutes.
Potash permanganate (1 per cent.) destroys it in 20 minutes.
Carbolic acid (5 per cent.) destroys it in 20 minutes.

It may surprise a good many to study the above table, especially when it is seen that carbolic acid stands at the bottom of the list and creolin at the head. It is, however, a well-known fact that either acids or alkalies weaken or neutralize the effect of a solution of rabic virus when inoculated experimentally into rabbits, and that an absolutely neutral solution is necessary in order to have uniform results. Even when a rabic brain or cord is preserved in glycerine, unless the latter is neutral the virus becomes destroyed very rapidly and no results may follow inoculation, even from rabic material. It is obvious how much danger may result from ignorant or careless methods in preparing the brain for diagnostic purposes.

That carbolic acid has very unreliable destructive qualities on the virus of rabies, was unfortunately demonstrated about four years ago in Chicago. Dr. Lagorio, of the Chicago Pasteur Institute, reports the case. "A boy had the skin on his hand slightly abraded by the tooth of a rabid dog. The wound was, within a very short time, cauterized with pure carbolic acid by a physician; six weeks later the boy died of hydrophobia."

The fact that lemon juice can be procured in nearly every American household, is strongly in its favor, as is the fact of its being fluid, and furthermore much less painful than either caustic or actual cautery, besides having a much more powerful and reliable effect in destroying the rabic virus.

Experiments conducted by de Blasè and Travali (quoted by Dr. A. Marie) showed "complete inactivity of an emulsion of a rabic cord in a 1 to 1000 solution of bichloride of mercury injected immediately on mixing. Also of emulsions in a 2.5 per cent. solution of potash permanganate, and in those of 50 and 90 per cent. alcohol inoculated after 24 hours. An emulsion in 25 per cent. alcohol inoculated after 24 hours, developed rabies in eight days; it took five days to render it inactive."

An emulsion of rabic cord rendered distinctly acid to test paper by adding one or two drops of acetic acid, or distinctly alkaline with a small crystal of soda carbonate, is rendered inoffensive even in large doses. Carbolic acid from 5 per cent. to 2 per cent. destroys the virus only after one or two hours respectively. Boric acid in fifteen minutes, lemon juice in seven minutes, nitrate of silver is mediocre; the sulphates of copper and zinc, ammonia, hydrochloric and sulphuric acids are active. According to Bokai and Szilaggi, ten drops of a solution of chlorine in 10 grammes of distilled water completely destroys the virus, as do bromine water and essence of eucalyptus.

The uncertainty of destroying all the virus in a wound, no matter how thoroughly disinfection and cleansing with the most potent antiseptics is carried out, necessitates the further precaution of adopting the Pasteur treatment in order to lessen the chances of a fatal development of hydrophobia in persons bitten by a rabid animal; and this should be administered *at as early a date as possible.* Every day of delay means a day's growth and development of the virus in the person's system; hence as many days as are let pass before commencing the Pasteur treatment means so many days' start. That is to say, if under no treatment the virus ordinarily would develop in 21 days, and the person did not present himself for treatment until

the seventh day, the danger of death from hydrophobia would be very great, as the ordinary treatment takes from 15 to 18 days and requires another week to produce its full immunizing effect on the system, and become protective. As there is no way known, at present, of ascertaining the virulence of the virus of street rabies, beyond that of inoculation subdurally of guinea-pigs or rabbits, etc., which requires from eight days upwards in the former and fourteen days upwards in the latter, there should be no delay in reaching the nearest institute where Pasteur's antirabic treatment can be secured.

Wounds on the head and face from the bite of a rabid animal develop the disease more rapidly than those on the extremities; those on uncovered, or bare portions of the body, prove more dangerous than on parts protected by clothing. Where a number of animals or people are bitten in quick succession, those attacked first are most liable to acquire rabies, unless protected by long hair or clothing, which seems to wipe the virulent saliva from the teeth.

A RAPID RECOVERY FROM FRACTURE OF THE OS SUFFRAGINIS.—A letter from Dr. T. S. Childs, Saratoga Springs, N. Y., under date of Nov. 12th, contains the following interesting item: "The great race horse 'Chuctanunda,' who met with an accident, causing an irregular fracture of the oz suffraginis of the off foreleg, on Aug. 9th, 1903, while exercising on the Saratoga race track, was shipped to his Amsterdam (N. Y.) home to-day (Nov. 12th), comparatively all right, and practically sound. He will be retired to the stud. He was the champion sprinter of America in 1902, and valued at $60,000. He is owned by Hon. John Sanford, of Amsterdam, N. Y., who is thoroughly well pleased with his condition. He was treated by Drs. R. E. Waters, of Gravesend, L. I.; Dr. T. S. Childs, of Saratoga Springs, N. Y., assisted by the kind advice of Dr. William Sheppard, of Sheepshead Bay, L. I., and Prof. Andrew Smith, of the Ontario Veterinary College, Toronto, Canada, who was called in consultation. I will give you a full report of the case later."

LOU DILLON, 1:58½, wears no check rein and trots in an open bridle.

WILD ANIMALS IN DISEASE.*

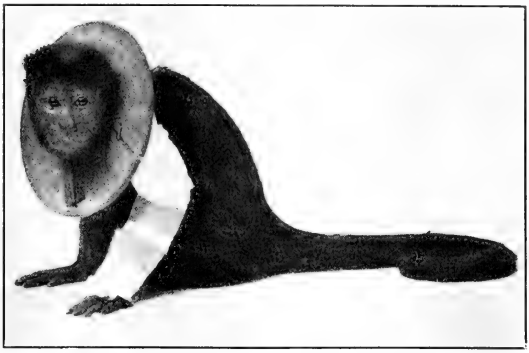
By W. Reid Blair, D. V. S., New York City.

The care of wild animals in zoölogical parks is usually entrusted to "keepers" of the widest experience that can be obtained. These men as a rule, are sympathetic and intelligent—two qualifications requisite for a man to become a successful keeper.

He who is most familiar with the appearance and deportment of a wild animal in health, at the various periods of its existence, will most readily appreciate all departures from the normal.

The careful study of different species of animals throughout their growth and development by one of good powers of observation, and a reflective habit of mind, is of great value.

The difficulty in arriving at a true diagnosis is greater in wild animals than in the domesticated species. Where docility is a pronounced factor, one arrives at a diagnosis by a process of elimination; by the use of the thermometer, the pulse, percussion and oscultation of chest cavity, and otherwise handling the patient without causing undue excitement.



Monkey with fractured arm.—The collar of wood prevents animal tearing off bandage.

*From the *Zoölogical Society Bulletin*, October, 1903.

The physical examination of a few of the smaller animals—especially the monkeys—is comparatively easy ; but not so with one of the larger primates. An orang, baboon or large macaque may be so nervous or ferocious as to make a physical examination not only extremely difficult, but many times even impossible. Great care must be taken in handling all members of the order of Primates as they are very sensitive creatures, of strong likes and dislikes, and very good memories. This I have observed on several occasions. One of them may be so treated that it would be almost impossible for the same person ever to succeed a second time in examining him. However, if the subject has the good sense to realize that no harm is meant, he will usually quietly submit, according to his natural amiability.

Before making an examination of a patient, the "history" of the case is obtained from the keeper ; and upon this much depends. To the experienced it means a great deal, and upon it, alone, a fairly safe diagnosis may often be made.

In many instances the disorder is readily apparent, and the exact location of it detected. Coughing, and rapid or difficult breathing point at once to the chest as the seat of the trouble. In many other cases, much greater difficulty is experienced. Patient watching, with a careful analysis and study of each individual case, however, usually dissipates all doubt.

When an animal is ill, it is, if practicable, removed from its fellows, whether its disease be contagious or not. In the former case the reason is obvious, but in all cases, quietness and extra comfort are needed. The patient can be better observed, the symptoms more closely noted, and the disease from which he suffers more clearly defined when it is alone, and left to the exercise of his own undisturbed will.

An important object in giving medicines to these animals is to concentrate drugs as much as possible. It is best that the animal should not know that it is getting medicine at all, so it becomes necessary to disguise the drug in some way.

Modern pharmacy has provided a large number of preparations for the practitioner of human medicine, which in some re-

spects are far more necessary to him who ministers to sick animals, which cannot understand the object of what must seem to them ill usage.

Again, there is every reason why they should get their medicine in the way that will cause the least disturbance of their feelings, and without that excitement which may follow a struggle to give medicine. Small pills, gelatin-coated, or sugar-coated, sweet lozenges, tablets or gelatin capsules, carefully concealed in an innocent-looking banana, may be administered to an unsuspecting ape, without the slightest trouble. Occasionally, however, he may suspect, and great is your dismay at seeing him minutely pull the banana apart, find the offending pill, test it with his teeth, smell of it, and finally, with a wry face, cast it through the bars of the cage at his keeper.

The nursing of sick animals is of the greatest importance. The essentials are pure air, sunlight, cleanliness and warmth, nourishing and sustaining diet. During convalescence, all kinds of food may be offered to tempt the appetite, first one thing and then another; but no food should be allowed to remain before the animal, because the very fact of its being constantly present will cause him to loathe it.

When an animal has no appetite, the stomach is not in a proper state to digest food—consequently, if forced upon him, it will cause indigestion and aggravate the case.

"YOUR journal is much appreciated, and the future issues will be looked forward to with pleasure."—(*Walter A. Stuhr, D. V. M., Ames, Iowa.*)

CARE OF ROYAL DOGS.—Emperor William has four light brown dachshunds, of which he is fond. These favorites, named Herr, Dachs, Bella and Liesel, live in a stone, ivy-covered house in the Park of Monbijou. They have their own cook and an open fireplace before which they can doze. Their dining room is hung with portraits of the dogs' high-bred ancestors and other dog pictures. Every second day one of the Emperor's gamekeepers visits the four dachshunds to see if they are properly cared for.

HISTORY OF THE TEXAS FEVER QUARANTINE LINE.

By Dr. W. N. D. Bird, Bureau of Animal Industry,
Buffalo, N. Y.

Read before the New York State Veterinary Medical Society, at Ithaca, Sept. 16, 1903.

Up to about 1890 very little attention had been paid to the enforcement of any National Texas Fever Quarantine; in fact, there was hardly any line known, compared to the line as it exists to-day. The loss to the cattle interests of the United States was appalling, caused by the indiscriminate driving and shipping of Southern cattle to the Northern ranges. Up to 1885 about all the restriction on the Southern cattle traffic was promulgated by some of the Northern and Western States and Territories, restricting the introduction of Texas or Cherokee cattle, as they were then called, to a certain period of the year. Illinois passed a law as early as 1867, and amended it in 1869, stating that no Texas or Cherokee cattle should be brought into the State of Illinois, except between the dates of October 1st and March 1st of the following year. Kansas passed a law in 1884 prohibiting the introduction, or the passing on foot through the State of any cattle capable of communicating Texas fever. Cattle which on affidavit were known to have been kept since the first of the preceding December in that part of the Indian Territory west of the east line of the Territory and north of the 36th parallel of north latitude, or west of the 21st meridian of longitude, and north of the 24th parallel of north latitude, could enter Kansas at will. A few of the other Western States and Territories passed and endeavored to enforce similar laws, governing the transportation of Southern cattle. One of the earliest regulations I can find which has as its object the prevention of the spread of Southern cattle fever infection, was promulgated by Messrs. J. H. Payne, H. M. Taylor and J. H. Fullin Wider, agents of the Bureau of Animal Industry at Topeka, Kansas, August 1, 1884, and was as follows: "Being requested by representatives of various railroad companies to make such suggestions as in our opinion would tend to prevent the spread of any

contagious disease among cattle, carried by them, we the agents of the Bureau of Animal Industry appointed by the Commissioner of Agriculture, respectfully recommend to all railroad companies engaged in the transportation of live stock, that all cars used in such traffic be thoroughly cleansed and washed immediately after unloading of stock, and further that any cars that may have been used in the through shipment of Texas cattle or cattle liable to communicate Texas or splenetic fever shall be disinfected by the use of quick lime. It is further recommended that the stockyard companies set aside certain pens for native, and that they be thoroughly washed and cleansed as above. During the season of 1885 the Bureau of Animal Industry through its inspectors spent a great deal of time and labor collecting information and data regarding the districts permanently infected by the Southern cattle fever infection ; to facilitate the work, a circular letter was sent out by the Commissioner of Agriculture, Norman J. Colman, addressed to the Texas cattle owners living in certain districts of Texas, naming a large number of counties, asking for information as follows : 1st. Have you purchased any bulls or other cattle, or do you know of any that have been brought from the north of the south line of Kansas to your vicinity, or to any part of the counties named above? If so, state the numbers, the location as near as possible to which they were taken, and the number, if any, which have died of acclimation fever. 2d. Do you know of any cases in which cattle from the eastern counties of Texas have been taken to the counties named above in the spring or summer months, and allowed to pasture on the same ranges with cattle native to the counties? If so, state if any disease occurred among the native cattle, and give symptoms and numbers affected as far as possible."

Answers to this circular were received and information by employés of the Bureau was obtained, and as far as possible at that time a line was established showing about where the northern limit of the infection existed, and the next two or three years the Bureau worked to find if possible the exact area and northern line of infection. In 1889 the Secretary of Agriculture

issued a proclamation to the railroads and transportation companies of the United States, stating a contagious disease called splenetic or Texas fever existed among cattle in the following described area of the United States: all that country lying south and east of line commencing at the northeasterly corner of Crittenden County in the State of Arkansas, then running in a northwesterly direction to the Osoge Agency in the Indian Territory, and thence running southwesterly to the Rio Grande at the intersection of the southeasterly corner of the Pecos County and the northeasterly corner of Presidio County in the State of Texas. No cattle should be transported from said area north or west of the above described lines under certain restrictions. Cattle unloaded for feed were to be kept in pens and enclosures set aside for this purpose alone and the pens to be cleansed and disinfected at least once a week until the frost of December. A subsequent order of the Secretary dated November 1, 1899, revoked the quarantine regulations, as the danger of the infection had passed for that year. In 1885 the splenetic fever was a great disturber of cattle values; thousands of dollars worth of cattle died from the disease and commerce between the States had been so unsettled that cattle values were estimated to have depreciated $50,000,000 or more; in consequence trade between North and South had been paralyzed.

Cause of splenetic fever in 1885 was supposed to be a parasitic vegetable germ which is supposed to live as a parasite on the grasses of those sections of the Southern States bordering on the Gulf of Mexico and northward along the Atlantic coast as far as North Carolina. The climatic condition peculiar to this section of the country seemed to be necessary for the propagation of this germ as a vegetable parasite—that is, to enable it to fructify, producing spores which will under favorable climatic influences reproduce the original germ. This germ is destroyed by frost.

During 1889 Kansas employed inspectors at different points to inspect cattle by their brands, as it was known that range of brands of cattle which were known to be infectious was below the danger area already described. The present chief inspector

of the quarantine west of the Mississippi, Col. Albert Dean, was one of these inspectors employed by Kansas at the Kansas City Stockyards to detect cattle with prohibitive brands and prevent their introduction into Kansas. In a letter to the Secretary of Agriculture, dated Feb. 27, 1890, L. A. Humphrey, Governor of Kansas, stated that as the State of Kansas, as it was geographically situated, was greatly exposed to the introduction of Texas fever, and sent a set of resolutions issued by the Live Stock Sanitary Board of Kansas, recommending several things which stated that as the State Legislature had failed to appropriate sufficient funds to pay inspectors at the suggestion of the Board, the Kansas City Stockyard Company and four prominent railroad companies assumed and paid the expense of five inspectors up to Dec. 1, 1899. These inspectors were very successful in their inspection, causing the loss from Texas fever in the State to fall to a minimum. The plan of inspection by these five inspectors was inspecting entirely by brands, in the knowledge of which they were especially expert, and giving no credence to any statements or history not agreeing with the origin shown by the brands, and that they have thus demonstrated absolutely that this is the only way to inspect against Texas fever with any guaranty of success.

The Board went on to say that the expense of these inspectors has fallen on Kansas and certain corporations, but other States and Territories were benefitted by their inspections, and the inspection under the authority of Kansas bore no weight with other States or the countries of Europe, whereas if the Government of the United States should assume and control this inspection, there would be great advantages gained for the cattle industries. Resolved that it is the sense and opinion of the Live Stock Sanitary Commission of Kansas that the inspection of all cattle being moved across quarantine lines established by the United States Government, should be made by inspectors appointed by and under salary from the Government. Acting from these suggestions and from demands of cattlemen throughout the United States, the Bureau in the year 1890 as-

sumed charge and supervision of the quarantine and transportation of Southern cattle, stationing Col. Dean, Chief Inspector of Kansas City, and a number of inspectors or live stock agents at such points as Argentine; Parsons, Kansas; Springfield, Mo.; Herington, Kansas, on the lines of the principal railroads carrying Southern cattle. These inspectors saw the cattle originating below the established quarantine line, by stamping the way bills and carding the cars.

These Southern cattle were routed to the quarantine yards of the principal live stock markets of the country. Information as to the destination of the cattle so inspected was mailed to Kansas City and from there to the point to which the cattle were destined.

At the end of the season of 1890 Col. Dean reported 21,292 cars of Southern cattle that had passed under the observation of himself and the several inspectors, and out of 70,000 Northern and Western cattle shipped from the Kansas City stockyards into Kansas, not one case of Texas fever was reported as originating from these cattle. Cars carrying Southern cattle were cleansed and disinfected before again being used for cattle traffic. There were only five outbreaks of Texas fever in Missouri and Kansas from cattle brought from Texas in February, 1890. About this time the investigation of Dr. Theobald Smith and F. L. Kilbourne as to the origin of Texas fever and its mode of propagation, was being published and known by the veterinary profession and the cattlemen. A most worthy discovery; and the names of Smith and Kilbourne will be remembered as having advanced the cause of science. The mode of transmission being now known, further experience only being necessary, the quarantine line of this time on to the present depended on the existence of the cattle tick in that territory. The object of the department was to place it far enough north as above known infection to be on the safe side. From time to time the line is changed to fit the exigency of the situation in the different localities. During the fall the live stock sanitary boards of the different States and Territories meet in a national session and

talk over the situation in each locality. Some of the States through which the quarantine line runs often do not wish an open season—that is, a period generally from Nov. 1st to Jan. 15th, in which cattle can be moved in for feeding or grazing. Other States more northern do wish this open season, and this National Sanitary Board in session recommend to the Chief of Bureau of Animal Industry certain changes in the line and restrictions as to open season, and the chief generally complies with these suggestions, and the Secretary of Agriculture issues regulations to govern the operations of the quarantine line for the coming year, making a government proclamation with restrictions to conform to the States or Territories to which cattle may be shipped or driven. It will readily be seen that where a disease was a grave menace to the cattle industry ten or twelve years ago, without adequate knowledge of the disease, and with no national supervision of the movement of animals, where to-day the mode of infection is known, and where the movement of animals is under strict national supervision, the danger of susceptible animals becoming diseased is very small, and the loss to stock-growers by this disease is inconsiderable. To-day the quarantine line starts at the Atlantic seaboard and meanders in a westerly direction, sometimes on State lines, other times going through a State until it reaches the last line of Oklahoma Territory, thence in a southwesterly direction to the Rio Grande and along the Mexican boundary to California, and northerly and westerly to the Pacific Ocean; a proof of California being below the line.

Inspectors are placed at points generally on lines of railroads leading from the quarantine territory, and they report to headquarters the movement of Southern cattle and their destination. During the closed period of the year cattle below this line can only be shipped by rail or boat for immediate slaughter, and the cars and boats so used to be cleansed and disinfected before again being used. If at any time cattle above this line are found to be infectious (ticky), they are considered as "Southern cattle" and the locality is quarantined. The Secretary of Agricul-

ture from time to time amends the regulation to govern the case as it may exist in a certain locality, as reported by inspectors of the Bureau. To-day Texas fever has no terror as compared to a dozen years ago. Experiments are being made with different ingredients to destroy the tick, for the Southern animals without the tick are no more dangerous than the cattle of the North in spreading the infection. When a successful dip is found to destroy the tick without injuring the cattle, the quarantine will be almost a thing of the past. Again, the veterinary profession is aiding the stock-growers in producing in Northern-grown animals an immunity to the disease by serum treatment, and by inoculations by a few artificially-grown young ticks. In the experimental stations of Missouri, Oklahoma, Texas, and a few other States, this is being done with very good results, whereby breeding animals of the North can be shipped south with a very good guarantee of living.

This account will give you some idea of what has been accomplished by the Bureau of Animal Industry in the last fourteen years with a disease which at one time nearly paralyzed the cattle industry of the country.

OXYGEN TREATMENT OF MILK FEVER.—Drs. White and Plaskett, Nashville, Tenn., writes as follows under date of Nov. 24: "We have been using oxygen in the treatment of all milk fever cases since it was first suggested in the REVIEW. For the past four and one half months we have used it in a great number of aggravated cases with not a single fatal termination. Each cow made a quick and complete recovery, with none of the usual complications. The udders were scrubbed and rendered aseptic before the injection. The oxygen, which is in a forty-gallon tank under high pressure, is allowed to flow slowly through a small rubber hose, to which is attached an ordinary milking tube. The udder is inflated until well filled with the gas. The cow is placed in position on sternum and allowed to remain without further treatment of any kind. Its beneficial effects are noticed almost immediately. They are on their feet in from two to eight hours and convalesce quickly. From our experience with oxygen inflation of the udder, we are constrained to assert without the least hesitation that it is all, and even more, than has been claimed for it."

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

ACTINOMYCOSIS IN ANTELOPE.

By W. Reid Blair, D. V. S., Veterinarian and Resident Pathologist, N. Y. Zoölogical Park.

A short description of this animal may be of interest to the Review readers. As many of you doubtless know, this familiar animal on our Western plains is being rapidly exterminated, and will in all probability be our next large species to become extinct.

With the possible exception of the small deer of Texas, the prong-horned animal is the smallest ruminant animal inhabiting North America, north of Mexico. It is the only living mammal possessing hollow horns (growing over a bony core), which sheds them annually. It is the only animal possessing a hollow horn which bears a prong or bifurcation; it has no "dew claws" as other ruminants have. The horns are placed directly over the eyes; the long hair of the body and neck is tubular; and that on the rump is erectile.

My attention was first drawn to this animal by the keeper, who said it had not been feeding for two days.

On going to the corral, we found the animal isolated, lying in one corner. There was a peculiar uneasy movement of its jaws, as if there were something in the mouth which could not be dislodged. While examining the mouth and head I found a swelling the size of a hen's egg on the left superior maxilla directly over the upper third molar. The swelling was hard and very painful, and with no evidences of any external injury; this, together with the knowledge of one previous case in the same herd, led me to diagnose it at once as actinomycosis.

The animal was removed from the herd and placed in a separate corral. With a strong hypodermic syringe the enlargement was impregnated with 40 grains of iodide of potassium in a watery solution. Two days later the swelling and surrounding tissues were painted with a strong tincture of iodine, and one drachm of iodide of potassium dissolved in the drinking water daily. On the fourth day the swelling was again injected with a strong solution of iodide of potassium.

The seventh day there was a profuse discharge from the nostrils, particularly the left one, of a white gelatinous, flaky substance. The enlargement seemed to be diminishing in size. On the tenth day the hair and skin over and around the swelling were exfoliated, leaving an ugly raw surface, which was dressed with xeroform. The patient up to this time was bright, appetite was fairly good, and seemed to have no difficulty in masticating its food; there was no appreciable failing in flesh. The case made satisfactory improvement for five weeks, with only a slight failing in condition of the patient. The wound on the jaw had healed nicely and the swelling had almost entirely disappeared.

A few days later while making an examination of the mouth to ascertain if any of the teeth around the swelling were loosened, I discovered an enlargement upon the lower jaw of the opposite side, at the angle of the inferior maxilla, which later proved to be another actinomyces abscess. It was thought best not to treat the animal longer, and it was chloroformed.

The autopsy showed that the first abscess had drained nicely, and that all of the diseased tissues had been exfoliated, leaving a clean dry porous surface behind.

The recent abscess on the inferior maxilla had involved a considerable portion of the periosteum and was beginning to affect the bone.

While I am in some doubt as to whether the treatment, if it had been prolonged, would have resulted in a cure or not, I am quite satisfied that the iodide of potassium treatment prolonged the life of the patient very considerably, as our experience with this disease among antelopes has demonstrated that it runs a very acute course, usually terminating fatally within two weeks from the first symptoms of illness.

FIBROMA.*

By THEODORE F. KREV, Student, New York City.

With your permission, I will be pleased to present for your discussion a paper on fibromata, which impressed me sufficiently to warrant its introduction, as the case seemed to me to be somewhat removed from the ordinary case of fibromata, as there was so little evidence of its presence.

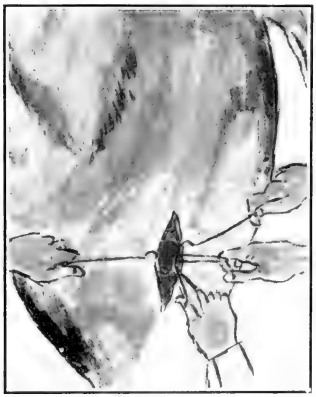
Situated near the insertion of the triceps abductor femoris muscle, on the off external thigh, it caused the animal to go

*Read before the Ontario Veterinary College Medical Association, Oct. 16, 1903.

quite lame, and was quite hard and painful to the touch, the region of the tumor being but slightly swollen.

In compliance with the request of my preceptors, Drs. Hall and McCully, the animal, a fine chestnut gelding, was brought to the hospital and subjected to a thorough and rigid examination, at the end of which the case was diagnosed as fibromata, and an operation suggested, to which the owner consented.

In answer to questions as to the history of the case, the owner stated that a year previous, while being exercised, the animal fell and slid on the injured side, regained his feet, trotted lame for a few moments, then resumed a sound gait, and



nothing more was thought of the matter until several months subsequent, when he again went lame; was immediately turned over to a skilful veterinarian, but had failed to respond to treatment.

The *modus operandi* consisted of throwing and securing the animal, shaving the parts, scrubbing the parts with green soap and washing with antiseptics. We then injected eucani, ℥i, on each side of the proposed incision; an incision was then made about five inches long from above downward, and the tumor was plainly visible. With the aid of a scalpel, Dr. McCully soon cut it from its attachment on all sides, but it proved to be so tough and deep seated it became quite difficult to proceed with the scalpel; so we proceeded to thread the tumor, which was soon accomplished, using a heavy curved needle and heavy linen thread, which was passed directly through the centre.

This simplified matters considerably, as we could then draw the growth in any direction desired, thus enabling the operator to proceed with a heavy curved scissors to complete the excision of the tumor, the lips of the incision being held apart with two Volkman's retractors. The cavity was then thoroughly cleansed with 1/2% solution of formalin, and packed with antiseptic gauze, and the operation completed by suturing with sterilized silk, using interrupted stitches, and then dusted with iodoform and boric acid powder, equal parts. The after-treatment consisted of daily syringing with formalin, creolin, and peroxide of hydrogen. The animal made a full recovery in about eight weeks, at the end of which time he trotted perfectly sound.

APLASIA OF THE LEFT SUPERIOR CENTRAL INCISOR IN A MARE.

By JOHN J. REPP, V. M. D., University of Pennsylvania, Philadelphia, Pa.

The horses in a stable in an Iowa town were suspected of having glanders, and in making a physical examination of them, I noticed that a six-year-old standard-bred mare showed

absence of the left pincer in the upper maxilla. The mare was afterward found to be afflicted with glanders and was consequently sacrificed. I cut off the part of the incisive bones bearing the incisors, and, on closer examination, find that there is complete aplasia of the tooth in question. The middle incisor

of the right side and the intermediate of the left side are separated in their free portion by a space about 6 mm. in width. The body of the incisive bone of the left side is hypoplastic to such a degree that its width is 10 mm. less than the body of the corresponding bone on the opposite side, and the incisive foramen is displaced an equal degree to the left of the median plane.

A photograph of the specimen is here reproduced.

According to Goubaux and Barrier ("Exterior of the Horse"), diminution in the number of incisors has been reported rather infrequently. According to their records absence of the left upper nipper has been reported by only one observer, Megnin.

That the condition may often be overlooked, especially by those who have not acquired the habit of looking carefully into the horse's mouth, is evidenced by the fact that the mare to which reference is made above was the pet of two physicians, who had reared her and had driven her in their practice for three years.

RUPTURE OF THE PANCREAS IN A MARE.

By HUGH THOMSON, V. S., Newman Grove, Neb.

I was consulted on Aug. 14 in regard to a mare, as she would eat no grain; she eat grass and hay, and from what other information I could gain I diagnosed some trouble with the liver. She showed no pain at any time during her sickness. I prescribed eight powders of sodium chloride and sodium sulphate, and requested a report the next day, which the owner made, saying she was better. I prescribed eight more, and to report again, which he did, saying she was about the same and to call and see her. I found a bay mare, weight about 1150 lbs., pulse intermittent (around 40); mouth very sticky with saliva; tongue coated; dirty gray mouth; mucous membranes white, with yellowish cast; skin cold and lifeless, like tissue paper; drawing the hand over the eyes the pupils dilated, yellowish pale cast to sclerotic; heart's beat strong with metallic sound to each beat; fæces in pellets the size of English walnuts, three or four to each bunch, clay colored; bowels paralyzed, not the least murmur. Diagnosed liver trouble, probably hypertrophy, with internal hæmorrhage of either the spleen or pancreas. Prognosis unfavorable. Treatment given all through case: Digitalis, nux, gentian, ammon. chloride, potass. iodide and sodium chloride; also ergot and rectal injections of saline solution; occasionally a dose of colchicum and jaborandi. Called next day;

swelling back of forelegs, slight swelling on breast and mammæ. Next day larger, no pain in pressing it; fullness around back of diaphragm; slight swelling below stifles back to the perineum, half way to hock; no pain; mouth clearing up, also tongue; Schneiderian membrane moist and pink; mouth getting healthy moisture; patient apparently improving; quite fullness in abdomen; stiffness leaving; can raise the head without falling. I failed to mention that she would stagger if her head was raised high. Eyes beginning to get normal; pupils contracted to normal size. I began to believe that I had made a mistake as to internal hæmorrhage, as the patient appeared improving; stepped lively; whinnied for the other horses; responded to all commands; eat some oats; fæces soft; pellets same size, showing bowels still paralyzed. Continued the saline injections every three hours; gave aloin capsule per rectum; kicked with both feet; so had to take up front foot and raise head; she had the appearance of a pretty lively horse. Swelling of left breast continued on abdomen and thighs. Treatment continued.

On the 25th owner advised a discontinuance of my visits. On the afternoon of the 27th the owner called, saying the mare had quit eating, otherwise about the same. I gave him some nitro-muriatic acid dilute, with instructions, and agreed to see her the next morning, which I did. I found the patient dead, which had occurred peacefully, without a struggle.

Now, the most remarkable part comes in the post-mortem: Pupils dilated, mouth pale. Incision through swellings brought clear colored fluid, like water; tissues of a golden color, like Nebraska creamery butter; muscles pale pink; no blood came from incisions. On opening the abdomen there was a large outpouring of blood. When it struck the ground there was quite a bead on it. I should judge a large wash-tub of blood poured out. The stomach and bowels were empty and white colored; spleen pale blue; liver clay colored and hard, showing no inflammation; weight 26 lbs. Pancreas torn, black, like burnt steak and hard; one mass of burnt black tissue, hardened; mesenteric glands black and hard, size of English walnut; ovaries black and hard; uterus and bladder pale and healthy. On opening the diaphragm the tendonous portion had inflammatory streaks all over it; muscular portion pale pink; no blood in any of the bloodvessels; heart pale pink, not a drop of blood in it; auricles white; lungs white and very light; heart and lungs picture of health; not a particle of blood in lungs.

Is it not remarkable the length of time life was sustained in this patient—two weeks or fourteen days? On the second day of treatment the pulse beat regularly, did not miss a beat. There is no doubt in my mind that the rectal saline solutions, with heart stimulants, kept this hopeless patient alive. When I quit calling, the patient began to fail, as the owner became neglectful in his attention. At no time were there any swellings in the front legs, and only in the hind from the hocks up to the body. These swellings were deathly feeling from the start; there was no fullness to them.

Never having seen an account of rupture of pancreas and hæmorrhage, I send the REVIEW readers this report of the case in full.

TWO CASES OF LOSS OF HOOFS FOLLOWING BILATERAL PLANTAR NEURECTOMY FOR NAVICULAR ARTHRITIS.

By JOHN J. REPP, V. M. D., Philadelphia, Pa.

No. I.—Sorrel gelding, aged, brought to my clinic for treatment on account of being extremely lame in both fore extremities. The owner stated that he had been so for several years and that he was worthless to him in his present condition. I made a diagnosis of navicular arthritis and performed double plantar neurectomy on both fore limbs. After the operation he was able to move about with very little lameness. The horse was kept in the hospital 10 days and his feet soaked each day in a tub. At the end of this time he was taken home. The owner reported to me later that soon after taking the horse home his hoofs came off.

No. II.—Aged gray mare, very lame in the right fore limb, brought to my clinic by a man who had just traded for her, with the request that I nerve her to relieve the lameness. I made a diagnosis of navicular arthritis and proceeded at once to comply with his request by doing double plantar neurectomy on the very lame limb. Having done this the mare showed marked lameness on the other limb and he asked me to nerve that, which I did. The owner wanted to take her home as he did not want to incur the expense of keeping her at the hospital. I agreed to his doing this in case he would put her to pasture so that her feet might be kept soft by the dews. A short time afterwards he reported to me that the mare's hoofs came off within two weeks after the operation.

A TWO-HEADED MONSTROSITY.

Dr. W. H. Gilbert, Leesburg, Ohio, sends the accompanying photo of a calf which he delivered on July 29, 1903, from a shorthorn cow, 6 years old. Both front legs had to be removed at the body, and the heads being drawn close together, the dead fœtus passed the maternal passage after considerable traction.

THE SODA TREATMENT FOR AZOTURIA.

By W. P. Hill, Vet. 12th U. S. Cavalry, Batangas, P. I.

I have noticed from time to time in the different numbers of the Review the varied treatments advocated for azoturia; so I feel like giving to my *confréres* my success with Dieckerhoff's treatment, *i. e.*, bicarbonate of soda.

When I first started practicing I used purgatives, bromide of potash and hot clothes, but had very little success until I read in an English journal the soda treatment.

Case I.—I had a "hurry-up" call, the farmer saying his horse had dropped in the river while passing through hitched to his wagon. On arriving I found they had pulled the horse out on the bank. I passed a catheter, which I always do. I then had the horse hauled up to the barn on a sled and made him as comfortable as possible with plenty of bedding, and started on the soda, giving him ¼ pound every 4 hours; no other medicament was used; I kept this up for two days; when next I saw him he was up and the owner led him home that evening.

Case II.—This horse dropped in a large mud hole in the main street of the town; I had him hauled to a nearby stable; passed catheter and started the soda as before; this animal was

very fat and weighed 1500 pounds and seemed to be a very serious case; she laid three days, but on the morning following I raised her with slings, and from then on she made a good recovery, stopping the soda after she stood up.

Case III.—This one is to impress the importance of passing a catheter: the farmer had started to town with a load of hay and had got within a mile of the city when his horse suddenly refused to put the near hind leg to the ground, swinging it and acting in great pain; a practitioner close by was called in, who diagnosed it as a fracture of the acetabulum and advised shooting. The owner, an old client of mine, before taking this advice came for me; she was down when I got to her; I examined per rectum for fracture, and not finding anything assuring, I passed a catheter and on seeing the urine I knew at once what I had to contend with. I gave her the soda treatment and sent her home two days later, a distance of 15 miles. I never let a horse lay over three days without trying to raise it, and while down I have them turned after each dose. In administering the soda I put, say, ℥ ii of the dry powder on the back of tongue and drench it down with a swallow of water, then repeat.

This of course is not by any means a new treatment. I simply wish to record my success with the Dieckerhoff method. Its inexpensiveness and simplicity is another benefit.

I could mention many more cases with similar results, which naturally makes me a strong believer in the alkaline treatment.

An Old Horse Story.—A colored lad was sent to the city to sell a horse. A man approached him and inquired the price, when the boy told him that his master had instructed him to get $100 if he could; if not, to accept $75. The prospective buyer asked as to his faults. "He hab free very bad faults." "What are they?" inquired the man. "Well," said the boy, "my boss don't like dis hoss becase he am white, and de hairs gets all over his clothes." "What else?" "Well, whenever he drinks he drives his nose down deep into de trough, and dat wets de boss' leggins." "And what is the third fault?" "I fergets de third fault," said the boy. "Never mind; I'll buy him." After paying for the horse he led him to his barn, but in entering he struck heavily against the door, which caused the owner to examine his eyes, when he discovered the horse was totally blind. Meeting the boy a few days afterwards, the new owner said: "Say, boy, that horse you sold me is blind in both eyes." "Oh, yes, dat's so; dat's the third fault."

EXTRACTS FROM EXCHANGES.

BELGIAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

CONSIDERATIONS AND RESEARCHES ON THE PATHOGENY AND SEMEIOLOGIC VALUE OF SPRINGHALT [*Lénaux and Zwaenapoel*].—Springhalt is a functional abnormality which consists in the jerky, sudden flexion of one or both hind legs during locomotion. It is specially observed at the hock, whose somewhat convulsive play has peculiarly called the attention of observers, and according to Berton is under the dependency of the automatism of the tibio-tarsal angle, propriety of the hock joint to complete spontaneously without external active interference the motions of extension or of flexion, when arrived at a certain degree. . . . . Springhalt is not only the excessive flexion of the hock. If the exaggerated motion calls the attention more, it is first because it reaches in it a peculiar intensity, allowed by the joint itself, and also because the tarsal automatism gives it a striking convulsive character, and, again, because of the superficial situation of the hock, free from all muscular structure. . . . . In reality, most of the joints of the leg show the same functional disturbance, and the minute observation of facts will allow us to detect the presence of exaggerated flexions of the thigh and also of the phalanges. Springhalt then consists in the excessive flexion of the entire hind leg, resulting finally in its exaggerated shortening. Besides the flexion there is also a more or less marked abduction of the extremity. Etiology of springhalt is very obscure. There is one kind, essential, independent of all visible cause, and another symptomatic. This last is generally accompanied by lameness, has probably for origin a pain felt while the foot rests on the ground. But this symptom of pain is not sufficient to differentiate the two types. Lesions of the foot, of the coronet, diseases of the stifle, etc., may give rise to it. Many other conditions have been considered as causes, the shortening of the tendon or muscle peroneo-phalangeus, of the tibial aponeurosis, of the fascia lata, of the internal ligament of the patella, the sciatic nerves, the spinal cord, articular lesions, dry femoro-tibial arthritis, etc. Among the best admitted causes of

springhalt, such as: the lesions at the toe of the foot, those of the coronet, of the second and third phalanx, shortening of the extensor muscles, pseudo-luxation of the patella, etc., we find that they aid in reducing the flexion of the foot or of the stifle . . . . . just as in laminitis of the fore-legs, in backing or walking in soft and rough ground, springhalt has all the appearances of a compensatory act. The horse accentuates the shortening of his leg, carrying it also in abduction, so as not to strike the ground when one or the other of the articulations is not acting sufficiently. "To the imperfect closing of the articular angle in fault, he makes good by the most extensive flexion of those whose action is still normal. The tarsal automatism completes the movement in a passive way and gives its jerky character." The authors have made numerous experiments which have given them satisfactory results, and have brought them to the conclusions that in all cases of springhalt there is an alteration which interferes with the shortening of the leg and that the examination of a horse with springhalt must be made on all the joints of the leg affected, except that of the hock, and that not only the joint itself must be examined, but also all the elements which act in the production of the motions occurring, such as nerves, muscles, tendons, etc.—(*Annales de Med. Vet., June, 1903.*)

A Case of Torsion of the Uterus in a Mare [*Stiennon*].—A mare, pregnant, expected to deliver in about ten days, is taken with colic. A practitioner makes no positive diagnosis, gives antispasmodics, and, having no results, resorts to eserine and pilocarpine. As the animal grows worse, the author is called, and has no difficulty in diagnosing torsion of the uterus. The animal grows worse rapidly and dies. At the post-mortem the uterine lesions are extensive. The organ haf made a double turn on itself; the twist involves the portion of the vagina immediately back of the neck, which is tightly closed. The walls of the uterus are congested and about two centimetres thick. The colt is well developed. The broad ligaments are stretched and are also twisted. Colics have been said to be the cause of torsion of the uterus, and *vice versa*. The author asks whether in this case there has been primitive colics due to another cause having preceded or promoted the torsion? and concludes that such was the case, that there were colics first and that it was in one of the struggles that the torsion took place. For him, however, the post-mortem has demonstrated that the only cause of the abdominal pains towards

the end of the suffering was in the uterine lesions and that those were the cause of death. This case shows once more that torsion of the uterus may give rise to colics exceptionally severe, even fatal, and that practitioners called to attend a pregnant mare must not only at the beginning of his attendance but also during his treatment assure himself of the condition of the genital organs.—(*Annales de Brux., May, 1903.*)

Bacterian Anthrax in Calves [*Stiennon*].—If calves are not refractory to symptomatic anthrax, infection is, however, an exception. Experimentors have shown that the calf is much less sensitive to artificial infection than older animals; he resists a dose of virus—deadly for an adult; would he resist as well to a natural infection? A four-months-old calf has refused his food in the morning; his temperature is 40°; along the right ilio-spinal muscle there is a large tumor, extending from the withers to the croup; it is œdematous on its surface and crepitates in its depth; it is very little painful and of temperature rather less than the surrounding parts. There is a similar tumor on the right gluteal region. Diagnosis: Suspicious of anthrax. At the slaughtering, lesions of anthrax are found in the muscles and spleen, which, with bacteriological examination, confirm it. Conclusions of the author: Considering the rapid march of the disease, is it not evident that the animal has a great susceptibility to the disease? And, again, is not the severity of the lesions during such a short period evidences of this susceptibility? Then, give to calf the occasion to be spontaneously inoculated with the bacillus Chauvii, and the lesions produced shall be as serious by their characters and their effects as they are in more aged bovines. If calf resists better to experimental infection, it does not seem to be less receptive than adults to natural infection, this giving rise in it to as great lesions and serious results. —(*Annales de Bruxelles, May, 1903*).

Dose of Antitetanic Serum in New-born Colts [*J. Nandrin*].—The efficacity of the serum as preventive of lockjaw is admitted by all. The author has had the opportunity to test it in a farm where the slighest wound was followed with this disease and with fatal results. Eight colts had died in five years on the place, three of which were new-born. Adults on the farm seemed to be refractory—why? In 1897 the owner consented to have all his stock, adults and new-born, submitted to the action of antitetanic serum, and since then lockjaw does not exist on the farm. In 1897 the first inoculation on a new-born was to be performed. But what was to be the dose? As

10 c.c. seemed dangerous, only 5 c.c. were given for the first injection, which the colt received 48 hours after birth. Ten hours later it was taken with very severe symptoms, but without trismus, or spasmodic contraction of the muscles; the legs were flexible, the membrana nictitans did not cover the eye, there was no hyperæsthesia. The colt was in lateral decubitus; unable to stand up; the pulse was thready, almost imperceptible; respiration accelerated and abdominal; no cough; defecation normal; temperature 39.6°. No treatment prescribed. Two hours later, the condition was improving and in a few hours after, it entirely recovered. The troubles were due to intoxication by the serum. The second injection, made ten days later, was of 3 c.c. only, and was followed by no bad results. Since that day that dose of 3 c.c only is used—two injections being made, one 48 hours, the other on the twelfth day after birth.—(*Ann. de Bruxelles, Aug., 1903.*)

ITALIAN REVIEW.

By Prof. A. Liautard, M. D., V. M.

On the Importance of Prognosis in Veterinary Medicine [*Dr. E. Stragia*].—Called to attend a six-year-old horse suffering with very severe colic for an hour and a half, the author found his patient, one which had been some months previously operated for scrotal hernia at the clinic of the veterinary school of Pisa; he made a minute exploration of the inguinal region and found nothing abnormal. Rectal examination was also negative. As the animal was in great pain, laxatives were administered. The case was considered as one of stercoral colic. Improvement being very mild only, notwithstanding two injections of morphine, sulphate of eserine and pilocarpine were resorted to, but, as after waiting an hour no action took place, the diagnosis of intestinal obstruction was made, a very unfavorable prognosis given, and Dr. E. S. left him. A short while after came an empiric, who took the horse by the bridle, and, whip in hand, made him travel two good kilometres. The horse then was returned to his stall, and, after a few minutes, the drugs operated, defecation was abundant and the animal saved. . . . In another case, similar in symptoms, where purgatives, injections, anodynes, etc., and finally eserine and pilocarpine had been administered without results, and which after two days of treatment was considered as suffering with intestinal obstruction that laparotomy only could help.

The animal was then sold by the owner for 10 lires. Four days after the animal was in perfect health. . . . These two cases are recorded to show how one must be careful in making a prognosis, as often, notwithstanding all that is found in classical works, due to highest authorities, serious and unpleasant errors may be committed.—(*Il Nuovo Ercolani, July, 1903.*)

A Case of Tetanus—Recovery with Phenic Acid [*Dr. Maccagni Guido*].—A horse fell down and wounded his knee; he was taken home with some difficulty and some fifteen days after exhibited some peculiarities for which the author was called. He is stiff all over, his head carried elevated, nostrils dilated, the membrana nictitans covers the globe of the eye, the animal eats with difficulty—he has tetanus. For treatment it was decided to resort to injections of phenic acid, which the owner consented to after consulting another veterinarian. A mixture of 2 grammes of pure phenic acid in 20 of glycerine was prepared and used in three doses—one in the morning, one at noon, the other in the evening. Then, again, 8 gr. of acid were given in a bolus morning and evening, and 40 grams of chloral in two litres of water administered by rectum. Ointment of potass. cyanide was rubbed over the masseters and neck. On the third day the chloral was stopped and replaced by 24 gr. of phenic acid in five litres of water. Improvement was slow, but after about two weeks the doses of phenic acid were gradually reduced and stopped. About 340 grammes of the acid had been given during the whole treatment. There was but one abscess formed as a consequence of the injections in the neck.—(*Il Nuovo Ercolani, Sept., 1903.*)

Contribution to the Study of Spavin [*F. Belli*].—The nature and development of spavin being still disguised, the author publishes the conclusions he has arrived at by the microscopical examination of the lesions observed in 22 hocks and taken from animals lame with spavin during life. The various alterations of the articular surfaces, sooner or later, end in ankylosis; and this, complete or incomplete, almost always does not involve the periphery of the joint. Notwithstanding the complete ankylosis of the bones of the base of the hock, there are in four of them only insignificant osteophytes; it is evident that the central ankylosis is not consecutive to peripheric lesions. Then, says the author, the arthritic process of spavin travels a centrifugal way. The attention of the author is called by a lesion "said to be constant" of the cartilages of incrustation of the tibio-astragalean joint; it is principally situated in the

groove of the astragalus and the corresponding tibial crest. This lesion has some relations of severity with the lesions of the astragalo-navicular joint. The osteophitic production is not limited to the internal side of the hock; it may extend to the periphery and to the tibia and metatarsal; therefore, the treatment of this affection must not be limited to the ordinary seat of the exostosis.—(*Il Nuovo Ercol. and Rev. Gen., October, 1903*).

INTRAVENOUS INJECTIONS OF SUBLIMATE IN INFECTIOUS DISEASES [*Profs. Mariani and Da Monte*].—The following are the conclusions of the authors, after their experimental researches: Sublimate acts on the organism in increasing its resistance and promoting the formation of antitoxines, which allow it to resist either the toxines artificially produced or those from the inoculated microbes. The antitoxic power must be attributed to either a preventive vaccination, or a curative action toward the promoted intoxications. Weak doses of sublimate must be used and the injections repeated; too large doses act as a poison, adding its effect to those of the toxines. Solutions must be large to avoid phlebitis and thrombosis. Sublimate does not act as a bactericide, but as an antitoxic, and thus is explained why very weak doses are sufficient against intoxications and infections. Intravenous injections stimulate and increase the agglutinating properties of the serum of the blood and protect animals against fatal doses of bacterian toxines. Animals can be protected against experimental infections from diplococcus, streptococcus and bacteridia, if the sublimate is injected in veins in weak doses (1–50 of a milligramme to each kilogramme of living weight) and in very diluted solution. Preventive immunization can be granted, in giving animals repeated injections, 1–10 of milligramme, before the inoculation of a killing dose of toxine or of virus in the peritoneum—inoculated animals can be treated with still weaker doses of sublimate.—(*Il Policlino and Rev. Gen., Sept., 1903.*)

ACTINOMYCOSIS IN A DOG [*Dr. Arnaldo Fumagalli*].—The author was called to see a terrier, six years old, which had a swelling on the left side of the upper jaw, corresponding to the root of the first molar. This swelling was hard, adherent to the bone, about the size of a nut. The dog was in pain, suffered much in eating. On opening the mouth the two first molars were found loose, to such extent that their extraction was very easy. In examining the bottom of the alveoli the yellow characteristic granulations of actinomycosis were suspected and fully recognized under the microscope. The treat-

ment recommended was that of tincture of iodine externally and iodide of potassium internally, but with what result is not known. How the dog got the disease was not told by the owner.—(*Clinica Veter., Aug., 1903.*)

ENZOÖTIC MENINGO-ENCEPHALITIS IN FOWLS [*Dr. Arnaldo Fumagalli*].—A flock of 100 handsome fowls were in a large poultry yard, free from chicken cholera, although the disease prevailed in the district. One day five of the fowls took sick and died; the following days the same conditions occurred until finally the whole flock was destroyed. The following symptoms were observed: sudden attack; high fever; extreme weakness; staggering; entire loss of appetite; eyes partly closed; feathers standing; wings drooping; later on diarrhœa. The characteristic points are of nervous nature; there are disorderly motions of the head and neck; in some there were emprosthotonos, in others pleurosthotonos. Some of the birds rested the head on the ground, others were walking in circles. These conditions lasted but a few moments and soon the bird would resume its normal condition, yet death finally occurred. At the post-mortem nothing abnormal could be macroscopically observed. The central nervous system only showed extensive congested condition of the blood vessels of the cerebrum and cerebellum. The cerebral substance was softened; the ventricles contained an abnormal quantity of fluid. The author has not yet made the bacteriological examination and does not know if the infective agent is that of cholera or any other disease.—(*Clinica Veter., August, 1903.*)

GERMAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

SADICAL LESIONS OBSERVED ON ANIMALS (*Prof. Fröhner*).—Under the name of sadism are gathered all the injuries occasioned in men or animals by individuals under the impulse of a depraved sexual desire. German bibliography is very poor on records relating to sadism, having animals for victims, but foreign literature contains numerous examples. Guillibeau has reported three interesting cases on cows, goats, and steers. In France many cases are also recorded. Recently F. Reichert has treated the question in his pamphlet "on the significance of sexual psychopathy of man in relation to veterinary medicine." He enumerates all the errors of diagnosis to which sadism has

given rise. Fröhner himself has described under the name of gangrenous epizoötic œdema in bovines and ewes, an affection which he had observed recently and whose origin seemed to him mysterious. It is only later that he learned that this necrotic vaginitis and the septicæmia were the work of a sadic young man. The symptoms observed on 3 heifers, 2 cows and 16 ewes were: swelling of the anus and vulva, tenesmus, liquid diarrhœa with blood, tympanites, arched back, 136 pulsations, respirations 34; vulva and vagina infected presenting bloody striæ and brownish or black patches. Temperature at the rectum 39°, in the vagina 39°3. On each side of the loins, soft, cold, crepitating œdema. The cows died after 3 to 8 days, the heifers in 24 hours, the ewes lasted from 12 to 21 hours. At post-mortem the lesions were: complete absence of cadaveric rigidity, excessive inflammation of the anus, vulva and perineum; subcutaneous connective tissue of the kidney, loins and internal face of the thighs impregnated with greenish yellow liquid, clear and slightly odorant. Muscles soft; blood black, viscous, not coagulated. Petechia on the peritoneum; intestines normal except the rectum, which at half a metre from the anus was black and marked with greenish streaks and patches. Nothing abnormal in the spleen and kidneys. Pelvic muscles were greenish, puffy. Between the rectum and vagina there was a large clot of blood. The walls of the vagina, uterus and bladder were black and softened. Lungs and myocardium congested, pericardium and endocardium covered with hæmorrhagic spots. Fröhner had made a diagnosis of septicæmia following gangrene of the rectum, vulva and vagina. All the animals being dead and the barns well disinfected, the owner bought a mare in foal. She aborted abnormally after a few weeks. A week later this mare presented symptoms having much analogy to those presented by the animals that had died. The owner had to keep his animals a young fellow, 14 years old, kind of idiot, who made a full confession, and exhibited a stick with a sharp point, which was covered with blood. In his pamphlet, Reichert examining the legal side of sadism on animals says: "Whenever animals will be seen with wounds through manipulations from ill-disposed individuals, it will be necessary to look for the motive which has incited them. In general, the individual will say that it was to punish, to revenge himself; this is an explanation which may be plausible if the wounds are in any other region of the body except the sexual organs. But if these are the only ones injured, one is justified to conclude that

they were made under the impulse of a depraved sexual desire." —(*Deutsche Thier. Wochr. and Rev. de Med. Vet., Sept., 1903.*)

Crows as Conveying Agents of Epizoötics of Fowls [*Dr. Robert Klee*].—When, in October, 1901, he assumed his duties at Jéna, the author was informed that in a forest close by there was a colony of crows, among which in the preceding spring, many had died by *Syngamus trachealis.* In the following winter, he had a number of crows killed and found the parasites in 50% of them. As cold weather is not favorable to the development of the syngamus, Klee found this percentage very large and came to the conclusion that the colony of crows was a very dangerous hotbed of syngamosis. Indeed, during the summer of 1902 he had occasion to observe an epizoöty of syngamosis among the pheasants of the Prince of S——, which were in the surroundings and which out of 3,500 birds killed 1,700. The treatment resorted to was : suppression of the drinking water, which was replaced by garlic decoction, kitchen salt was thrown freely in the places where the birds fed, and finally following the method of Mouquet : intratracheal injections of a solution of salycilate of soda 5% with probe carried in the larynx and trachea. In this way the epizoöty was arrested. Klee considered it due to the presence of the crows and compared it to a similar outbreak observed by Megnin.—(*Fordschritte der Veter. Hyg. and Rec. de M. Veter., Sept., 1903.*)

Cancer of the Bladder in Horses [*Lehmeyer*].—The case is that of a heavy draught horse of 18 years, in good spirit, without fever and eating well. He has painful micturations, they occur about every half hour and are accompanied by the expulsion of a few drops of red urine. Tumor of the bladder was suspected. At the rectal examination, the bladder was found as big as a child's head and puffy in consistency. There was no fluctuation outside of a zone of the diameter of a hen's egg ; pressure at that point was followed by the expulsion of a bloody urine, containing clots of blood. The animal was sent to the butchery. At the post-mortem it was observed that the mucous membrane of the bladder, except where the fluctuation was detected by rectal examination, was invaded with masses of villosities, tumors half soft in consistency and bleeding on their surface. The microscopic examination showed the tumor to be an epithelioma with parimentous cells. There were no other localizations of the disease.—(*Wochens. fur Thiehr. and Revue Générale, Sept., 1903.*)

Surgical Treatment of Chronic Laminitis in Horses

[*Hansen*].—The author has tried to find a remedy against this disease, true infirmity, which reduces so much the value of the animal affected with it. Besides the general ordinary treatment (aloes, pilocarpine, baths) he does not hesitate to recommend and perform the operation consisting in the removal of the sole. The operation is done with the most strict disinfection of the extremity of the leg. The sole is thinned out, the plantar face is exposed in the portion corresponding to the third phalanx, displaced more or less. Generally the tissues are found tumefied and bleeding on a level with the antero-inferior border of the os pedis. The wound is treated antiseptically with sublimate and iodoform. Repair goes on quickly; a wide-web shoe is placed on the operated foot. This treatment has been resorted to in three cases. The first in a mare which had laminitis after parturition; she was cured in seven or eight weeks. She had been sick five weeks when the treatment was resorted to. The other two animals were also cured in the same time.—(*Mauneds. for Drylueg and Rev. Gen., Sept., 1903.*)

TROTTING RECORDS FOR THE YEAR.—Following are the records for 1903, as far as may be ascertained at this time: Trotting, two-year-olds, Grace Bond, 2:14¼, by The Bondsman; three-year-olds, Sadie Mac, 2:11½, by Peter the Great, 2:07¼; four-year-old, Judge Green, 2:10¼, by Directum, 2:05¼, and Wainscot, 2:10¼, by Alcy Wilkes, 2:16¾; five-year-olds, Lou Dillon, 1:58½; best by a mare, Lou Dillon, 1:58½; best by a gelding, Major Delmar, 1:59¾; best by a stallion, Cresceus, 1:59¾; fastest new performer, Lou Dillon, 1:58½; fastest to wagon, Lou Dillon, 2:00; fastest mile on half-mile track, Cresceus, 2:08. Pacing: Two-year-olds, Fata Morgana, 2:19¼, by Sphinx, 2:20½; three-year-olds, Miss Daphne Direct, 2:11½, by Direct, 2:05½; four-year-olds, Hal Chaffin, 2:05¼, by Brown Hal, 2:12½; five-year-olds, Bald Hornet, 2:07¼; fastest mare, Dariel, 2:00¼; fastest gelding, Prince Alert, 1:57; fastest stallion, Dan Patch, 1:56¼; fastest new performer, Tom Keene, 2:04¼, by West Egbert, 2:29¼; fastest mile to wagon, Dan Patch, 1:57¼; fastest mile on half-mile track, Prince Alert, 2:03½. To this string might be added the feat of Lou Dillion in pulling the old high-wheeled sulky in 2:05 on the Cleveland track, which is by no means the least important of the many wonderful performances chronicled this season.—(*Breeders' Gazette.*)

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

THE EDITORIAL ON THE ARMY VETERINARY SERVICE IN THE NOVEMBER "REVIEW" AND ITS EFFECT.

It was an unexpected pleasure to me, and doubtless so to every army veterinarian, to read the editorial on the "Army Veterinary Service" in the November REVIEW. It has shown us that the great body of veterinarians of the country still take an unabated interest in our future welfare as members of a branch of the profession that has undergone peculiar trials and tribulations; and it has also assured us that they will stand by us in the future as they have in the past, in a renewed effort to put the Army Veterinary Service on a serviceable basis to the Government and on a creditable foundation to ourselves as professional men.

It is true that any effort to right ourselves in our position in the Army must naturally come from within our own ranks, and if there has been any doubt as to the propriety of such a view, we were clearly shown by the War Department, by an explicit order, that this is the only proper way for us to pursue, if we wish to state our grievances and suggest an amelioration therefor.

We have, accordingly, taken the matter into our own hands in an endeavour to come to an understanding among ourselves as to what we need and what we deem expedient to suggest to our proper authorities. But we cannot be in a position to defend our proposition unaided by outside influence, after it has left the War Department even with its approval, and we must, therefore, be gratified to know that our colleagues in civil life are watching our efforts and are ready to help at such opportune time and occasion as are sure to arise.

This feeling must have been the impulse to an army veter-

inarian stationed in the East, from whom we have just received a circular letter asking for the opinion of all army veterinarians present in the States, whether he shall present a petition to the proper military authorities now, or at a later more opportune time, and asking sanction to the subject-matter suggested, which is drawn on a very modest basis, but happily, also, on a very just one.

We are not at liberty to mention the name of the author nor his suggestions, because we had no time to ask for permission to do so, but it may be said that he has had ample opportunity to inform himself directly of the present feeling at the War Department in regard to our position and its possible improvement. His suggestions are very much in the line of those set forth in the "Army Veterinary Department" for the past eight months, and as he has worked independently, but has arrived at nearly the same conclusion, our army colleagues should now clearly see the wisdom of advancing but a modest proposition, which on its face will bear nothing but urgent necessity and neglected justice. That the latter is such will be admitted from the fact that we have two army colleagues long past due the retirement age of the Army, one nearly seventy years of age, feeble and broken down in a long and arduous military service, and the other following him closely in years.

We believe that the frank editorial in the November REVIEW, which breathes a fine colleageal feeling for the army veterinarian, has had much to do in encouraging the move made by our army colleague, and if the matter is now given proper and immediate attention by all of us in the Army, we shall soon be again in the field for another trial in a just and needy cause.

(O. S.)

* * *

FOREIGN ARMY VETERINARY NOTES.

The *Veterinary Journal* (London) announces in its October number the opening of the "Department of Tropical Veterinary Medicine" of the Liverpool Institute of Comparative Pathology. Encouraged by its success in the study of tropical diseases of man, and by the remarkable speech of the late Professor Nocard, of Paris, delivered to the School of Tropical Medicine in Liverpool a few weeks before his death, and in which he emphasized the great national want of systematic training and research in tropical veterinary medicine, the Institute has now opened a veterinary department, the objects of which are set forth as follows:

1. To train veterinarians in the special subject of tropical diseases of animals.

2. To afford facilities for research in these diseases and organize expeditions for this purpose.

3. To organize preventive measures in the tropics against diseases of animals.

The course of instruction is as follows:

I. Lectures and clinical instruction in the diseases of animals in the tropics.

Bacterial diseases: Anthrax, black quarter, glanders, spirillum fever, the pasteurella, etc.

Diseases—cause unknown: Cow-pox, horse-pox, horse sickness, rinderpest, etc.

Blood parasite diseases: Trypanosomiasis, surra, nagana, dourine, mal de cadera, etc.

Other parasitic diseases: Coccidial diseases of animals—filariasis and other helminthiases; skin parasites.

II. Laboratory instruction.

Technique and methods of examination of blood, secretions, excretions, etc.

Methods of immunization against diseases.

Testing of products for the prevention and cure of tropical animal diseases.

The laboratories occupy one floor of the Liverpool School of Tropical Medicine. Suitable accommodations for animals are provided at a nearby farm station. A museum on tropical veterinary medicine is being established.

Fees for course: ten guineas. Board and residence may be secured in the neighborhood of the Institute; charges for a period of not less than two months £1 per week.

We have copied the essentials of the course in tropical veterinary medicine in the hope that someone of our young army veterinarians may see his way to attend the course at Liverpool. Anyone of us who has served in the Philippine Islands must see the immediate great purpose of such a course of special instruction. Our impotent struggle against glanders, surra, African farcy, rinderpest, and a number of skin diseases new to us, constitutes one of the darkest pages in the history of our army veterinary service. Not that we were entirely and alone to blame for such incompetency, for at times we were not asked at all, but instead the advice was taken of army surgeons or even of some officers "who were born and raised on a stock-range," and who knew all about these diseases by intuition, but

yet those of us who were earnestly seeking the truth and striving to do some sensible good, have heavily felt the gap in our knowledge as regards the causes, nature and the practical treatment of these tropical diseases. With the rush and confusion of the war now over, a veterinarian properly posted on tropical diseases of animals should have no difficulty in taking his proper seat in the councils of military or civil administration, and if his advice would be heeded, incalculable benefit must result to the Islands, which were devastated of their various domestic animals by the scourges mentioned. (O. S.)

* * *

THE NEW "ROYAL WARRANT" OF THE ENGLISH A. V. D. JUST PUBLISHED.

According to the *Veterinary Journal* (London), November, 1903, the new "Royal Warrant" reorganizing the English Army Veterinary Service has just been promulgated to the Army by the Secretary of State for War. It is in effect as follows:

WAR OFFICE, 9th October, 1903.

ROYAL WARRANT.

Army Veterinary Service.

EDWARD, R. I.—Whereas, we deem it expedient to amend the regulations relating to the promotion and pay of officers of our Army Veterinary Department;

Our will and pleasure is that the Warrant of Her late Majesty, Queen Victoria, dated 26th October, 1900, as amended by Our Warrant dated 20th March, 1902, shall be further amended as follows:

Rank.

I. The substantive ranks of officers of our Army Veterinary Department shall be in future as follows:

Colonel, lieutenant-colonel, major, captain and lieutenant.

The following shall be inserted in article 320:

As *major-general*—the colonel holding the appointment of director-general, A. V. D.

Appointment and Promotion.

434. A lieutenant shall be eligible for promotion to the rank of captain on completing five years commissioned service, provided that he has previously qualified as prescribed by our Secretary of State.

435. A captain shall be eligible for promotion to the rank of major on completing ten years service in the rank of captain, . . . provided that he has served three years abroad, and has previously qualified in such manner, etc.

436. Promotion to the rank of lieutenant-colonel shall be made by selection from majors, of not less than fifteen years service, who have served at least three years in India, and have previously qualified, etc.

437. Promotion to the rank of colonel shall be made by selection from lieutenant-colonels who have served five years in that rank.

Brevet Rank.

438. An officer of our A. V. D. shall be eligible for promotion to brevet-rank under condition laid down in article 36.

Instruction: Distinction in original investigation or research may, in the case of an officer of our Army Veterinary Department, be regarded as "distinguished service of an exceptional nature other than in the field," within the meaning of article 36.

Pay and Charge Pay.

439. (We leave out the schedule of pay, half-pay, and retirement pays, as it is quite lengthy. The director-general receives £1,200 a year.)

Conditions of Retirement on Account of Age.

586. The director-general shall retire on completion of three years' service as such; the retirement of colonels shall be compulsory at the age of fifty-seven, of lieutenant-colonels at the age of fifty-five, and of majors at the age of fifty-five, or after 28 years of service if they have previously been passed over for promotion to lieutenant-colonel, provided that in no case shall they serve beyond the age of fifty-five.

Conditions of Retirement on Account of Medical Unfitness.

588. An officer of our Army Veterinary Department placed on the half-pay list on account of medical unfitness shall, if not previously retired on account of age, be retired from our Army at the expiration of five years from the date on which he was placed on the half-pay list, or if reported by the medical authority to be permanently unfit for duty, at such earlier date as may be decided by our Secretary of State.

It is our further will and pleasure that the non-commissioned officers and men of the Army Veterinary Service shall be formed into a corps, to be designated the "Army Veterinary Corps," and shall be graded as follows:

Farrier-quartermaster-sergeant.

Staff-farrier-sergeant.
Farrier-sergeant.
Shoeing-smith-corporal.
Shoeing-smith.
Private.
Given at our Court, etc.

By His Majesty's Command.
ST. JOHN BRODERICK,
ROBERTS, F. M.
Commander-in-Chief.

[NOTE: By this Royal Warrant the English Army is the first to have a veterinarian with the rank of major-general.
(O. S.)]

DIGESTION OF SUGAR AFTER REMOVAL OF THE PANCREAS.—Lüthje has experimented on dogs and removed every vestige of the pancreas, including even the duodenum. Even after this operation, the animal did not entirely lose the power of digesting sugar, especially after he had been placed upon starvation diet.

OPPORTUNITIES FOR VETERINARIANS IN MONTANA.—In Montana there are a number of locations for veterinary surgeons that should be desirable, and since Montana has a meat and milk inspection law under State control, it is likely that competent veterinarians locating in these cities would ultimately receive appointments as meat and milk inspectors, particularly since under this law it is believed that such positions can only be filled satisfactorily by competent veterinarians. The most desirable of these locations at the present is Missoula, in Missoula County; Kalispell, in Flathead County; Great Falls, in Cascade County, and Billings, in Yellowstone County. The salary for the position of meat and milk inspector in Cascade County is $1,500 a year; Missoula County, $1,200 a year; Flathead County, $1,000, and Yellowstone County, $750 a year. Montana should offer in a number of localities good paying prospects for competent men. It is said that the meat and milk inspection positions can only be offered to those taking up their residence in the State. That loyal veterinarian, Dr. M. E. Knowles, of Helena, is Secretary of the Meat and Milk Inspection Commission, and we advise anyone wishing to avail himself of this opportunity to write to him, and he will undoubtedly furnish all the information and assistance which he can, as he is devoted to the success of the new law.

BIBLIOGRAPHY.

TEXT-BOOK OF VETERINARY MEDICINE. By James Law, F. R. C. V. S., Director of the New York State Veterinary College, Cornell University, Ithaca, N. Y. Vol. V., Parasites, Parasitism, etc. Ithaca: Published by the author, 1903.

With Vol. V., Prof. Law has completed the great undertaking to which he has devoted so much study and work for a number of years past, and has accomplished the great task of giving to the English-speaking veterinarian a comprehensive and modern treatise upon the whole range of veterinary medicine. It is the most pretentious work in our language, covering a greater variety of subjects, and bringing each subject down to the most recent researches and embodying the advanced conception of the etiology of diseases, together with the prophylactic and therapeutic measures for their prevention and cure.

The REVIEW has on different occasions referred to the four preceding volumes as they were published, and has advised its readers that they should have this system of medicine in their libraries, because there is scarcely a single subject to which they could desire to refer that is not fully covered. And the present volume is fully up to the standard of its predecessors. The author is an authority upon the subject of parasites, and his classification of the many varieties is probably the most exhaustive in our literature.

After giving a comprehensive chapter upon "Parasites and Parasitism," treating of their life history and characteristics, he successively takes up the different families and the diseases which they engender, and it would seem that there could be no circumstance connected with the subject which the author has failed to comprehend and record. Each page bears evidence of the most thorough and searching investigation, which is put together in systematic and regular order.

At the close of this volume there is added a general index of the whole work, which is so complete that it would seem that when any subject is sought it can be found with the slightest trouble.

We repeat that Prof. Law has fairly won the applause of his colleagues throughout the English-speaking world, and we have no doubt that his work will take its place in every library that aspires to hold the very best books that our literature can boast of.

DR. SCHWARZKOPF, U. S. Army, has a letter in the *Breeder's Gazette*, of Nov. 25, on "Requirements of a Cavalry Horse."

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CORRESPONDENCE.

AS TO THE SOLUTION OF COLLARGOLUM.

PROSPECT, OHIO, Nov. 16, 1903.

Editors American Veterinary Review:

DEAR SIRS:—An error crept into my communication on collargolum, which was published in the REVIEW some months ago. Instead of it being ½ oz. collargolum dissolved in 8 oz. of distilled water, it should read: ½ oz. collargolum dissolved in 24 oz. of distilled water.

Kindly correct same in next REVIEW, if convenient, and oblige, Yours sincerely,

W. E. A. WYMAN.

OBITUARY.

DR. JAS. H. POWERS, a well known veterinarian of Providence, R. I., died of Bright's disease in that city, Oct. 18th, 1903.

He was a graduate of the Ontario Veterinary College and a member of the Rhode Island Veterinary Medical Association.

SOCIETY MEETINGS.

GENESEE VALLEY VETERINARY MEDICAL ASSOCIATION.

A meeting of this Association was held at the Hotel Gerard, Rochester, N. Y., Oct. 15, and was called to order at 10.30 A. M. There were present Drs. D. P. Webster, Hilton; J. W. Corrigan, Batavia; G. C. Kesler, Holley; A. George Tegg, Rochester; J. C. McKenzie, Rochester; L. R. Weber, Rochester; Carl Weber, Rochester; J. H. Taylor, Henrietta; A. McConnell, Brockport; P. J. Johnston, Williamson; W. B. Switzer, Oswego; and W. E. Stocking, Medina.

The morning session included the routine business of the Association. There was interesting discussion on the subject of illegal practice, which resulted in a motion, which was carried, authorizing the appointment of a committee to take this matter in charge and make plans to proceed against illegal practitioners.

After much discussion on various subjects of interest to the profession, the meeting adjourned to meet at the veterinary hospital of Dr. A. George Tegg at 2 P. M., at which place a very interesting clinic was held. The operations included the removal of a large tumor from the shoulder of a horse, which was very skilfully done by Dr. J. W. Corrigan. Dr. A. George Tegg, assisted by Dr. J. H. Taylor and others, very successfully removed several fungoid growths from the superior cervical region of a horse. Dr. Corrigan demonstrated the value of a new style of molar cutters, which worked to perfection. Dr. G. C. Kesler became very enthusiastic over his ability to administer restraint in minor demonstrations with the twitch.

After a great deal of discussion upon the above operations and the skilfulness with which they were performed, the meeting adjourned at 4.30 P. M. W. E. STOCKING, *Secretary.*

ONTARIO VETERINARY COLLEGE MEDICAL SOCIETY.

The above society held its first meeting of the session of 1903-04 in the lecture hall of the college, Friday evening, Oct. 16, at 7 o'clock, and was called to order by the chairman, Prof. C. H. Sweetapple, with Dr. W. R. J. Fowler acting secretary. Following the opening address by Prof. Sweetapple, the

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JANUARY, 1904.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, Nov. 15, 1903.

The fortieth annual meeting of the American Veterinary Medical Association was important from more than one point of view, and it is not in this chronicle that the many important parts can be brought out; yet there is one among the many which I think may escape attention, and to which I must refer, because of its connection with similar facts which have occupied the attention of veterinarians in Europe during the last few months. If one reads with care the excellent address of ex-President Stewart, he will find a most interesting part relating to veterinary education, to veterinary colleges, their curricula, their requirements, the length of their courses, etc., all of which may be resumed in a few words of criticism and warning, viz.: Our colleges are much in need of improvement, and it becomes the Association to see that those improvements exist, not only in catalogues, and announcements, but also in reality. Prof. Stewart has done well in sounding the bell of alarm. If one studies the announcements and catalogues of some of the veterinary schools of America he certainly will find that those of this year are about the same as those of previous sessions. Improvements are much in need.

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Old Europe has lately been taking measures to improve veterinary education by various ways. In Austria, where the

degree of bachelor is now required for admission, the curricula of its schools have been lengthened and increased. In Italy, bachelor degree is required for admission, five years of study before graduation can be obtained, the creation of additional chairs, opportunities to be created to allow veterinary students to follow medical studies, and *vice versa*. And even in England a special opportunity is now given for the study of tropical veterinary medicine. It seems that the first idea of this last step was suggested by Nocard in a conference that he held in Liverpool May 11, 1903, in which he pointed out the importance of the losses sustained because of the trypanosomes in India and Africa, especially by surra and nagana.

The Johnston Laboratory of the University of Liverpool has been opened, and has for its object the preparation of veterinarians as well as physicians for the special study of tropical diseases of animals. It is a post-graduate course, which certainly will do much good.

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There is also another move made in a somewhat similar line. I refer to the course of application of the school of Hanover. Carried out during the month of August, this course, where men like Dr. Dammann, Dr. Kaiser, Prof. Berg, Dr. Arnold, Dr. Malkmus, Prof. Frick and Dr. Rievel have lectured on special subjects and specialties, such as contagious diseases and their study, with practical work on their bacteriological diagnosis, meat and milk inspection, jurisprudence, etc., has met with most satisfactory and encouraging approval from every one interested, and veterinarians of all ages have matriculated for the course and become most attentive students once more.

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But from what I have said one must not accept the idea that American schools are altogether inadequate to their obligations and to the future welfare of their students. Indeed, a short time since, in looking up some veterinary educational matters, it seems to me that I read in one of them the delivery of lec-

tures on veterinary military practice. Of course, at first, it would seem that the idea is peculiar, and that, after all, whether military or private, the practice of veterinary science is always the same. Perhaps it is; and I must apply to those who have for years followed that specialty for advice; and so I address myself to my old friends Griffin, Le May and Schwarzkopf. I am quite sure they will agree with me, and will, no doubt, endorse the idea of the creation of a special chair; no, but at least the delivery of special lectures. This is suggested to me by the reading of a little work which I have just received, written as it is by a French army veterinarian, Dr. G. Joly, and is published by J. B. Baillierè et fils.

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The title of the work is "Diseases of the Trooper Horse." Dedicated to Principal Veterinarian J. Jawulet, the book treats the subject of veterinary practice strictly from the military point of view. The principal contagions, glanders and distemper, occupy the first pages, then come epizoötic lymphangitis, the typhoid affections, horse-pox, pustular dermatitis, intestinal affections, over-working, diseases of the skin, of the apparatus of locomotion (broken knees, lameness of the shoulder, of the hip, etc.), the ostitis of fatigue, the fractures, the wounds caused by harness, wounds of war (viz., by swords, by all arms, by artillery projectiles). And, after giving veterinary statistics of various armies, it is completed by colonial diseases and by those of camels.

It is an important want that this book comes to fill, and our military veterinarians will no doubt be glad to study it, even if it is in French, as the reading is easily understood, and, after all, they are all familiar with the peculiar phraseology that the subject embraces.

There are three essential points which show the usefulness of the work: (1) the specialization of the subject, imposed as it is by the peculiar conditions of life and utilization of the trooper, conditions which give to its pathology a peculiar character; (2) the manner in which the diseases have been presented,

and (3) the importance of the statistics, which demonstrate, in such powerful manner how great and valuable is the importance of the educated veterinarian in the army.

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But I see that from reading the address of the Ottawa meeting I have been brought to make remarks on veterinary education, on its improvement, and finally have filled a bibliographical notice. Let me continue and say a few words of a valuable pamphlet that Prof. Lanzillotti-Buonsanti, of Milan, has kindly sent me, "l'Esperimento della Cura dell Afta col metodo Baccelli," ("The Experiments on Treatment of Foot-and-Mouth Disease by the Method of Baccelli.") Our readers remember that several months ago I told them of this form of treatment, which at the time it was presented created such a sensation, and found among veterinarians many advocates, it is true, but perhaps a larger number of adversaries. A general experiment imposed itself, so to speak, and it is the description and conclusions of this experiment that are presented in the pamphlet I have received. Without entering into the minutia of the entire experiment, I will give you the general conclusions of the author:

"Resuming briefly, I can conclude that it being demonstrated that bovines have a perfect power to support sublimate corrosive in the therapeutical dose of 0.04 gr.–0.05 gr. per each 100 kil. of living weight, the efficacy of the treatment by the method of Baccelli is demonstrated to the point of view that intravenous injection of a solution will lower the temperature more or less, shorten the course of the disease, cure more readily the localizations, and avoid the after great losses of the animals and of their products. Therefore, the method deserves to be adopted. Applied antiseptically, it is perfectly innocuous, must be resorted to as soon as the first symptoms appear, and may have to be repeated a second and even a third time.

"When the disease is serious and on several animals, either by the great virulency of the infecting agent or special condi-

tions of the affected, and that serious lesions of the heart may occur, death early or late is unavoidable. In these cases the method of Baccelli, like other forms of treatment, is absolutely powerless to cure; . . . . but it is not justifiable to say that death is due to the injection of sublimate.

"I have said it before, and repeat it to-day, it will be only with time that the method will be appreciated to its value.

"And until an immunizing or curative serum, of easy and practical use, is found, the method of Baccelli must be the treatment of predilection, as being innocuous, when judiciously applied, and giving better results than any other treatment, and principally in the recovery of the localized lesions of aphtha."

All this is very well for foot-and-mouth disease in Italy, but I think Salmon prefers his method, and the results he can obtain with it.

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As I cannot permit my European news to be too rusty, I will, although this chronicle has been long, send our friends a few words about the last International Congress of Hygiene and Demography, which has been at Bruxelles from the 2d to the 8th of September, 1903, and to which more than 500 delegates of all nationalities were present. Among the too many questions which were discussed, one of the most important was the fifth, viz.: "*Are Human Tuberculosis and that of Domesticated Animals Due to the Same Species of Microbe, the Bacillus of Koch?*"

Thus presented, the question was difficult to answer. What was to be understood by domesticated animals? Did it mean the mammalia only, or were birds to enter also into the sphere of the discussion? For the majority, aviary tuberculosis was to be ignored, although Mr. Gratia, of Bruxelles, insisted that the bacillus of this tuberculosis was that of Koch adapted to peculiar biological conditions, which practically can be considered as of great danger to man.

As to the relations between human and bovine tuberculosis, the question has advanced but little, as no new fact has been presented.

The majority of the reporters—Gratia, de Jong, Arloing and Fibiger—fought hard for the doctrine of unicity. Prof. Kossel, of Berlin, presented *de novo* the defence of duality, and his conclusions were strongly supported by Prof. Löffler and Kirchner. It seems certain that but one conclusion is imposed, viz., that the human bacillus is less virulent for cattle than the bovine bacillus, and this conclusion is accepted by all. It is evident that there are differences to the point of view of the virulency, between the bacillus of bovines and that of man, but are those differences specific? Are they due to two distinct species of microbes, or only simply to variations of breeds, born from conditions of media and have become fixed? This is a question that by a majority of the votes one congress cannot answer, because in the scientific world, less than anywhere else, the opinion of the majority cannot be considered as being always the expression of absolute truth. It is sufficient that bovine bacillus may occasionally infect man (the most pronounced dualists admit it), and this justifies all the measures which have for effect the prevention of the use of meat or milk of tuberculous animals.

The question was thus judged, and, ignoring all doctrinal points, the congress by 25 votes against 5 declared that *human tuberculosis is principally transmitted from man to man, but in the present stage of our knowledge, Congress considers that it is proper to prescribe measures against the possibility of infection to man by animals.*

The next congress will be held in Berlin in 1907.

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I have just received a handsome view of the members and of the ladies who attended the meeting at Ottawa. It is with most gracious appreciation that I send my greetings to all, and my thanks to the good fellow who has given me this great pleasure.

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I have just received the contribution that the faculty of the New York-American Veterinary College has forwarded for the

Nocard Monument Fund, amounting to one hundred and five dollars. I have remitted the same, and am requested to address to the contributors the thanks of the Committee. I also wish to thank them personally, as this handsome response was made to my call, and shows their appreciation of one who belonged to the veterinary profession, whose work has been of such great value to it and to the world, and who will be regretted, not only by those who knew him, but among the many for whom science has no nationality. A. L.

THE ETIOLOGY OF AZOTURIA.

While the etiological factor in the induction of this common affection of horses has not yet been discovered, many have advanced theories which strongly appeal to our sense of reasoning. The most constant phenomena in its production are the short season of idleness, the unrestricted consumption of highly nitrogenous food, and the high condition of the subject, with plethora as a prominent accompaniment. Such an animal usually is attacked suddenly soon after undertaking vigorous exertion, whether in the performance of labor or at simple exercise. Upon these more or less constant conditions, theories have been evolved and promulgated by observers ever since the disease was first described, without being able in any instance to demonstrate satisfactorily the real exciting cause of the apparition of the well-known symptoms which so frequently terminate in fatality. So many exceptions, however, to this history are being recorded by various observers that we fear our theoretical notions of the pathology of azoturia will soon need revision. In the present number of the REVIEW, Dr. E. B. Ackerman, of Brooklyn, N. Y., reports two cases with systemic conditions in direct opposition to the usual history. The writer can add another fatal case occurring in an emaciated convalescent from typhoid pneumonia, the attack occurring while taking his first walk in the stable gangway, while yet receiving stimulant treatment, and even before the staggering gait had entirely disap-

peared. From these and many other reported cases of somewhat similar import, we feel that we are as far from being in possession of any real knowledge of the causes operating to produce the disease as we are from understanding its pathology and therapy.

RETROSPECTIVE.

In the forty years' existence of the American Veterinary Medical Association it has had 25 different Presidents, 15 of whom are living, and consequently 10 have passed away (Stickney, Copeman, C. M. Wood, Curtis, R. Wood, Thayer, Bryden, Huidekoper, Michener, and Clement). Of these 25 Presidents, New York and Massachusetts each contributed 8, Pennsylvania 3, Indiana 2, with one each from New Jersey, Maryland, Missouri, and the District of Columbia. There have only been 13 different Secretaries during this long period, 9 of whom yet survive, but four (Jennings, Burden, Budd aud Michener) having died. While Massachusetts furnished such a large quota of Presidents, her sons have apparently not sought the important functions of the Secretary's portfolio, as not one is accredited to her, while New York has given almost half of the entire number, there being 6 to her credit, New Jersey, Pennsylvania and Missouri have 2 each in the list, the only other State to be represented being Iowa, from which the present incumbent hailed when elected, though he has since removed to the Keystone State. New York's sons have filled the position 21 years, Missouri 8, Pennsylvania 6, New Jersey 4, Iowa 1. The longest service by one man was that of Michener, which covered the period from 1880 to 1888, Stewart being a close second with 7 years in harness, Robertson and Hoskins tying at 5 years.

ELSEWHERE in this issue will be found the report of the Committee on Animal Diseases and Animal Foods of the New Jersey Sanitary Association made by Chairman William Herbert Lowe, D. V. S., at the annual meeting of that association

held at Lakewood, N. J., Dec. 4th and 5th, 1903. Chairman Lowe's report should be read by everybody interested in modern veterinary sanitary science.

It is announced that Dr. Frank Burr Mallory, of the Harvard Medical School, after long and exhaustive investigation, has discovered that the germ that causes scarlet fever is of animal origin, and not due to a vegetable organism, as has been held by medical men. Dr. Mallory is to present a paper to the Boston Society of Medical Sciences on this important subject.

The Veterinary Medical Association of New Jersey was ably represented at the recent meeting of the Illinois State Veterinary Medical Association by Dr. Geo. W. Pope, Superintendent of the U. S. Animal Quarantine Station, Athenia, New Jersey. Dr. Pope is Secretary of the New Jersey Association.

Prosecution of Violators of the Veterinary Law Being Pushed in New Jersey.—Veterinarians and others are cautioned not to attempt to practice, under any pretense whatever, in New Jersey without a license, for President William Herbert Lowe, of the State Board of Veterinary Medical Examiners, is after violators of the law. President Lowe is the author of New Jersey's new law and he is determined that it shall be enforced. "Dr." R. R. Sample, of Freehold, Monmouth County, was the first to be arrested, tried and convicted. He served some five months in the Freehold jail. "Dr." George Locke, of Flemington, Hunterdon County, has been indicted, convicted and now awaits the sentence of the court. "Dr." William E. Brock, of Rutherford, Bergen County, has been arrested for practicing veterinary medicine without a license and placed under two hundred dollars bail. Two prescriptions were found in the Bergen County pharmacy written by "Dr." Brock, which made unmistakable evidence. "Dr." C. T. Smith, while serving the Hudson Coal Company, Jersey City, Hudson County, in the capacity of veterinarian without a license, committed suicide. "Dr." Henderson, an unlicensed veterinarian, Jersey City, Hudson County, has fled from the State to avoid arrest and prosecution. The State Board is doing some detective work, and no doubt other arrests and prosecutions will follow if necessity should require.

ORIGINAL ARTICLES.

PASTEURELLOSES.

By Prof. E. Nocard, of Alfort.*

Under the name of "Pasteurelloses," Ligniéres has collected all of a group of infectious diseases included before under the appellation of "hæmorrhagic septicæmias."

We know that Hueppe while studying the bacteria of *Wildseuche* of Bollinger in 1886 was struck with the resemblance that it had with those of *Schweineseuche* of Löffler, of septicæmia of rabbits of Gaffky, and of chicken cholera of Pasteur. A comparative study of these four microbes convinced him of their identity; morphology, biological properties, pathogeneous effects on animals of experiments, all were superposable; and, again, the etiological conditions of those four affections being similar in many points, Hueppe came to the conclusion that there were in reality various forms of one and an alike infection, for which he proposed the name generally adopted of "hæmorrhagic septicæmia."

Since then the boundaries of "hæmorrhagic septicæmia" have considerably enlarged. At first, all the infections due to an *ovoid bacteria* (*cocco-bacillus*), *not colored by the method of Gram*, *cultivatable on gelatine*, *without liquefaction of the media*, were classed in it; then, the characteristic becoming little by little less precise, numerous other forms more or less close to it, which could not be placed with other groups less open, were thrown into it, and thus diseases due to bacteria colored by the Gram or liquefying gelatine were found among the others. On the other side, while a greater number of infections were thus made related to hæmorrhagic septicæmia, their pathological species were indefinitely increased; as soon as were observed the

* The last work written by the learned professor, delivered by him in a lecture at the Pasteur Institute, published in the *Revue Générale de Medécine Vétérinaire*. Translated by A. Liautard.

absence of one of the secondary characters of the microbe type or some difference in the biology or virulence of the microbe, a new disease was created.

It is in this way that the list of the septicæmias of birds has been increased by the addition of enzoötics, which it was thought proper to differentiate because of some peculiarity of the bacteria which was studied, peculiarities which most often were insignificant.

On another side, the name proposed by Hueppe was not very proper; it is by the comparative study of specific bacteria that he came to identify the diseases observed, and it is to an anatomical character, important but inconstant, that he borrows the label which he has just created.

Indeed, if the very acute forms of the diseases thus grouped are very similar and deserve well the name of hæmorrhagic septicæmia, it is not so any more for the subacute forms, or those chronic from the start, where the lesions, localized on one or another viscera, arrive after a slow evolution to caseification or sclerosis of the tissues.

And, again, the septicæmic evolution and the congestive and hæmorrhagic lesions referred to by Hueppe are observed in numerous affections, very different from each other, and that no one would think to relate to the former (anthrax, rouget, etc.).

In reality, the variability of the evolution is such for the various infections, and even for one single infection, that a criterion for the formation of groups of types or for their differentiation cannot be asked of pathological anatomy. And, again, I repeat it, the synthesis realized by Hueppe was based on the comparative study of pathogeneous bacteria, and it was to that unique point of view that one had to consider to revise usefully the existing classification. This serious work has been undertaken by Ligniéres, director of the Bacteriological Institute of Buenos Ayres; it is far from being complete, but the results reached so far have thrown a strong light on the subject and a little order in the present chaos.

After eliminating from the hæmorrhagic septicæmias diseases manifestly foreign to them, Ligniéres has created two distinct groups: the "Pasteurelloses" and the "Salmonelloses."

The former are due to microbes analagous to the bacteria of chicken cholera and classified by Trioisan in the gender *Pasteurella*. The gender *Salmonella*, recently created, has for type the bacteria of hog cholera of Salmon.

If the family of the *Salmonelloses* is scarcely outlined, and so far only includes the infection type, hog cholera or swine pest, it is not the same of the family of the *Pasteurelloses;* this one has been well studied, firmly built, and includes a great number of serious diseases, attacking all animal species.

All the affections which are thus grouped are due to bacteria which belong to the gender *Pasteurella*, and which present all of the following essential characters: *Cocco-bacilli, with colored poles and clear centre; very polymorphous; immobile; giving no spores; specially œrobic; not colored with Gram; cultivatable in meat bouillons, on gelose and gelatine; not cultivatable on natural potato with acid reaction; not liquefying gelatine; not coagulating milk; not giving indol in pancreatic bouillons; not reddening the gelose of Würtz; giving with cultures in bouillons a suigeneris odor.*

These characters are common to all the Pastuerellas and can be always verified. But the variability of each type is such that they cannot be differentiated with certainty one from the other, neither by their biological characters, nor by their pathogeneous effects upon reacting animals.

Indeed, the pathogeneous action of all the types is the same or about the same on mice, rabbits and guinea-pigs.

Inoculation under the skin of a mouse, in the muscles of a rabbit, in the peritoneum of a guinea-pig, will kill rapidly (8 to 36 hours), and the autopsy will reveal extensive lesions of hæmorrhagic septicæmia, and if the injection has been made in the peritoneum, the cavity will ordinarily contain a reddish abundant fluid, very poor in cells, very rich in microbes; at even doses, the inoculation of the peritoneal exudate seems much

more virulent than that of the richest culture in bouillon serum.

The cultivation of the blood and visceræ shows that the microbe has invaded the whole organism ; but if pure cultures are desired, the autopsy must be made immediately after death ; often, even before death, the organs are invaded by banal microbes, coming from the lungs or the intestines.

This promoting action of the pasteurellic toxines towards secondary infections is observed not only on the small animals of experiments, but it is also manifested in natural infection, and among the peculiarities of the history of the Pasteurelloses, one of the most interesting is the frequency and severity of secondary infections in all the subacute or chronic forms of the disease. Even, sometimes, the action of the Pasteurella is ephemeral and so slight that it may pass overlooked ; nevertheless, its toxines have had time to make upon the phagocytic cells such depressing effect that the organism may become the prey of the vulgar bacilli which it lodges and which are ordinarily unable to produce any pathogeneous action.

One can understand how these secondary infections complicate the study of the diseases and what errors they may lead to.

Another important character common to most of the Pasteurella is their frequent localization on splanchnic or synovial serous membranes, in the subacute or chronic forms of the disease.

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There are many other points which are common to Pasteurelloses. A first attack, followed by recovery, confers *immunity*. It then seems that vaccination against Pasteurelloses must be easy. In reality it is a very difficult thing to obtain in the conditions of practice.

Attenuated cultures are easily obtained, but when they are to be applied extensively, great difficulties are in the way ; until lately the results obtained were incomplete and uncertain. Very recently Ligniéres has indicated a method of vaccination, very original in that sense that the vaccine shall be efficacious against all the Pastuerelloses.

He prepares this *polyvalent vaccine* as follows : Vials of Er-

lenmeyer containing a thin layer of peptone-bouillon where six different *Pasteurellas* have been introduced (sheep, beef, horse, swine, goat, chicken), are thus placed in the oven at 42°-43°; they remain in it for the first vaccine five days, and two only for the second. The attenuation which is thus obtained allows the inoculation, without danger, of animals of any species, breed or age.

The two vaccines are inoculated under the skin, at 12 or 15 days' interval, and in varying doses, according to the species and the weight, from one-eighth to one cubic centimetre.

If the predicted results are confirmed, Mr. Ligniéres will have solved, in a truly practical and unique manner, one of the most difficult problems of bacteriology.

Hyperimmunized animals against a given Pasteurella furnish an active serum against it. This fact has been proved by Kitt and by Leclainche for *chicken cholera;* by Kitt and Maye, de Schweinitz, Leclainche, and Wassermann for *Schweineseuche;* by Blin and Carougurn for the *Barbone* of buffaloes. Ligniéres has shown that the principles exist for all Pasteurelloses; he has seen, besides, that any antipasteurellic serum possesses a preventive and curative action against all Pasteurellas, slight but well marked.

To be sure, this action is much more marked towards the Pasteurella used for the production of the serum; nevertheless, the fact of the close relationship between all the Pasteurellas is once more demonstrated.

It was this which gave Ligniéres the idea to prepare a *polyvalent serum.*

Whether *mono* or *polyvalent*, any antipasteurellic serum is difficult and long to prepare; horses, which, notwithstanding the subject of selection, are very susceptible to Pasteurellas; during the immunization many subjects die, either by infection or by intoxication.

Therefore, one must go on slowly, carefully, use only small doses and renew the injection only after the animal is entirely over the effects of the preceding ones.

As immunizing products, Ligniéres uses mixed cultures of the six types of Pasteurellas, which he used to prepare his vaccine (these cultures have been kept up for several years in his laboratory and their virulence is slightly weakened by more than five hundred passages upon gelose).

To avoid all accident, he begins in vaccinating the horse, as I have said before, then he injects under his skin, every four or five days, doses of mixed cultures obtained in the oven at 35°, increasing little by little from five to twenty cubic centimetres; he does not go beyond that dose; at each inoculation the animal exhibits a very severe reaction, sometimes alarming, but it is of short duration; after two or three days, everything is in order.

The serum is both preventive and curative against all the Pasteurelloses; but the curative action is much more marked when the serum has been injected nearer the beginning of the disease; as soon as the secondary infections, so common and so dangerous in all Pasteurelloses, are present, the serum, still useful, is much less efficacious.

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Pasteurelloses attack all animal species; they bring close together and gather together affections whose relationship was not even suspected; and yet, on closer examination, one finds that all the pathological forms which have thus been grouped present striking analogies.

Indeed, in spite of the variety of affected species, the same processes are observed everywhere, giving rise to essential lesions which everywhere are identical. The similitude of the modes of development is such that the series of clinical and anatomical manifestations observed in the various species are often superposable, and that, sometimes, those which are missing in one series may have been foreseen and found again.

The constitution of this family, so remarkably homogeneous, not only shows the excellent value of the bacteriologic criterion in pathological classification; it furnishes also valuable information for epidermiology; it assists the genesis of contag-

ions and in a striking manner shows the passage from saprophytism to parasitism.

The etiology of Pasteurelloses is, indeed, one of the most interesting parts of their history.

Some Pasteurella are, so to speak, optional parasites; they can live in saprophytic conditions in external medias.

It is thus that, in 1881, Gaffky found in the water of the Panke a bacteria which, inoculated in the rabbit, gave it a septicæmia which was transmissible in series; this same bacteria of the *experimental septicæmia* of Gaffky was afterwards found by Smith and then by Thoinot and Masselin in the epidemics of *natural septicæmias;* it was a Pasteurella.

Pasteurellas are much diffused in external media; they are found in soils, waters, upon vegetables, in the digestive canal of healthy animals; some of those saprophytic forms are pathogenous at times, under more or less expressive conditions of receptivity.

Most of the infectious enteritises of birds, *wildseuche*, *rinderseuche*, *barbone*, *lombriz*, proved from an infection of saprophytic Pasteurellas, born in an external medium, and contagion plays only a secondary part or even none in their genesis.

In other Pasteurellas, the part of contagion appears little by little, and in some cases become predominating or exclusive. Septicæmia of rabbits, enteritis of birds due to saprophytic infection, may afterward be propagated by contagion and assume the character of true epizoötics; typhoid fever of horses, distemper of dogs, chicken cholera, appear but little outside of contagion.

First, occasional parasites, Pasteurellas may little by little become accustomed to this new parasitic life, and show themselves more and more apt to create new infections.

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Some etiological circumstances render these *rising contagions* peculiarly dangerous. The microbes, although having become clearly parasites, are still able, for a long time, to return to saprophytic life. And an epizoötic, which has been

smothered at great expense, is seen to reappear the following year without the possibility of accusing the importation of a new sick individual. On the contrary, the agents of well differentiated *old contagions*, are unable to return to this original state; they have become "parasites of necessity." Against those, measures of sanitary police are all powerful; they are difficult and uncertain with the former.

We already know, in veterinary medicine, a great number of well-defined Pasteurelloses.

The following table will give an idea of their importance to the economical point of view.

ANIMAL PASTEURELLOSES.

1. *Aviary Past.*— { Chicken cholera. / Aviary diphtheria.
2. *Past. of rabbits.*— { Septicæmia of rabbits. / Septicæmia of Beck. / Epizoötic rhinitis of Roger.
3. *Past. of guinea-pig.*—
4. *Past. of wild animals.*—(Wildseuche).
5. *Past. of sheep.*—(Pneumo-enteritis—lombriz).
6. *Past. of goat.*—(Infectious pneumonia).
7. *Past. of bovines.*— { Pneumo-enteritis (rinderseuche). / Septic pleuro-pneumonia of calves. / Diarrhœa of calves ("white scour"). / Entiqué.
8. *Past. of buffaloes.*—(Barbone).
9. *Past. of swine.*— { Contag. pneumonia, schweineseuche. / Swine pest or schweineseptikæmia.
10. *Past. of horses.*— { Typhoid affections (influenza). / Infectious pneumonia.
11. *Past. of dog.*— { Distemper of dog. / Typhus of dog (disease of Stuttgart).
12. *Past. of cat.*— { Distemper of cats. / Broncho-pneumonia of the cat of Siam.

It is not my intention to speak to you of all those diseases.

Chicken cholera, which is the type of the septicæmic Pasteurelloses, has been described to you, and later on you will know with *hog cholera* what relates to *swine plague*.

I will only say a few words on *lombriz of sheep*, *white scour of calves*, *typhoid affections and infectious pneumonia of horses*. These diseases, so different in appearances, have, however, many common points that I wish to bring before you to convince you of the great progress, scientific and practical, which the work of Ligniéres has allowed us to realize.

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Under the name of lombriz, in Argentina, a disease of sheep is known which every year kills many subjects. The disease attacks the young especially, shortly after their being weaned: it is manifested by weakness, loss of flesh, diarrhœa; then comes a cachectic condition, and when the animals die, they are true skeletons; there is very little fat, and this is soft; the meat is pale, flabby, atrophied and infiltrated with a clear serosity which is found all over in the subcutaneous and interstitial cellular tissue.

At post-mortem, most commonly, such large quantities of filiform, reddish, quick-moving worms are found in the abomasum that it is natural to consider them as the agents of the disease. Their reddish coloration is said to be the proof that they have sucked the blood through the thickness of the mucous membranes; their great number explains the progressive anæmia of the subject and the cachectic state which precedes death. The abomasum is not the only organ where worms are found; they may also be in the intestines; sometimes also in the bronchia, where they may be in great number. All this explains well the generally accepted opinion that the large mortality among the sheep is due to vermiform parasites, to lombriz.

Some veterinarians, however, had doubts upon the correctness of this etiology. If most part of the animals that die are extensively infested with worms, there are those which at post-mortem exhibit but a small number; there are even cases where none are found, and yet these, after, as well as before death, pre-

sented all the signs of the progressing cachexia which characterizes lombriz. On the other hand, nothing is more common than to find at the autopsy of fat and strong sheep which have never shown the slightest symptom of the disease, either in the abomasum or in the intestines, or in the lungs, very large numbers of those same worms.

Therefore, the disease may exist without worms, and again they may be there in great number and yet no disease be present. Conscientiously, then, it is not possible to consider the worms as the essential and necessary agents of the disease.

These facts being recognized, Ligniéres showed that the worms of the abomasum were strongyli (*S. contortus* and *S. instabilis*), parasites which are unable to implant themselves on the mucous membrane and suck the blood as other worms do, such as sclerostomas and especially ankylostomas. Ligniéres soon found that the red coloration of the worms was not due to blood that they had sucked, but to a peculiar pigment of their tissues, which disappears as soon as the worm, exposed to the air, stops moving. On the other hand, the constant integrity of the mucous membrane of the abomasum shows well that the worms which are swarming in its cavity were not implanted in its thickness.

These facts well established, Ligniéres was not so slow to observe that among the many sick animals presented to him, many gave general symptoms indicated especially by a great elevation in their temperature; out of those some died which did not have time to become cachectic, but, important fact, did show at the autopsy with or without worms in the abomasum or the lungs, distinct lesions of pneumonia, pleurisy, pericarditis or of arthritis.

This was an important point for him. These animals evidently died because of an infection to which the worms were entirely stranger.

The study of these lesions soon brought him to the discovery of a microbe, to which his preceding studies allowed him to attribute the essential part in the pathogeny of lombriz, exclusive-

ly of many and various other microbes which were found with it.

It is, indeed, a cocco-bacillus of the Pasteurella group, very close relation to the one that Ligniéres himself has demonstrated to be the cause of typhoid affections of horses.

The inoculation of this microbe will reproduce at will all the modalities that lombriz may assume in natural conditions.

* * *

If Ligniéres has succeeded so rapidly in solving this difficult problem, it is because he was marvellously prepared by his previous researches on the *typhoid affection* of horses.

Under this name is designated a serious infectious disease. All veterinarians know well its proteiform character, and its clinical manifestations, so numerous and so varied in appearance. Its scientific study, full of difficulties, had discouraged all those who had attempted it.

I must acknowledge that when Ligniéres spoke to me of his intention to undertake that work, I tried to dissuade him. "It is an ink bottle," said I; "you will be drowned in it; so many others, better qualified, have lost their time and found nothing." I could not stop him. With his characteristic strong mind, his earnestness and power of work, Ligniéres started, and, after three years of stubborn efforts, he succeeded in finding out what typhoid affection was. I still remember his joy and the astonishment of our colleagues when for the first time Ligniéres told us that he would give typhoid fever to a healthy horse, and kill him inside of 48 hours with a fulminant form of the disease. He did what he promised. And, eight hours after the injection of a small quantity of culture, the animal had all the most marked symptoms of the disease and died twenty hours later, with the classical lesions of typhoid affection. And, then, he created before us, I might say at will, all the other forms of the disease—pneumonia, pleurisy, pericarditis, enteritis, arthritis, meningitis and even ophthalmia, all of typhoid nature.

This typhic microbe, which had until then escaped all researches, is a cocco-bacillus analogous to that of lombriz, equally dangerous by its toxines, which place the organism in condition

of receptivity for all the secondary infections proceeding from the lungs or the intestine; it is as delicate as that of lombriz; as difficult to isolate from lesions a little old, where in return a great number of ordinary microbes pullulate and for which he has marvellously prepared the ground of culture.

* * *

Diarrhœa of newly-born calves is sometimes a true calamity; it is principally severe in the south of Ireland, where it kills more than half of the calves born. Most of them die in a few days in the week that follows birth, after having had a white, foaming, incoercible diarrhœa called "*white scour*"; others, in small number, recovered from this diarrhœa, die later, in two or three months, after having exhibited more or less marked symptoms of a disease of the chest; at the post-mortem are found numerous or extensive centres of the pulmonary tissues, which are caseous or suppurating; this is what Irishmen called the "*lung disease.*"

These diseases, apparently so different, have, nevertheless, a close relationship. *Lung disease* is observed only on farms infected with "*white scour*," and farmers know well that calves recovered of this last disease are, so to speak, condemned to die with the other, the lung disease.

Having been asked by the Agricultural Department of Ireland to study these serious diseases, I was able to show that, contrary to the opinion generally accepted, which attributed them to a coli-bacillar infection (Jensen), "*white scour*" and "*lung disease*" were but complications of a primitive pasteurellic infection, by umbilical infection. The demonstration, however, was rather hard.

Indeed, if almost all the calves affected with "*white scour*" die, the duration of the disease varies very much.

Most often, death occurs only after several days (from 3, 6 to 8 days), following an intense intestinal discharge; the fæces, expelled at every instant, are diarrhœic, white, foaming; the animals lose flesh rapidly; the flank is hollowed, abdomen retracted, loins arched, eyes sunken deep, hair dull and staring; the beasts

strain violently and moan; the temperature, generally higher than normal, drops suddenly towards death, and the animals remain stretched on the ground or on their excrements, unable to rise or to stand.

At times, the calf dies the very day or the next after birth, without having exhibited the ordinary signs of the disease; it seems as if diarrhœa had not had time to appear.

In other cases, though rare, the symptoms are less pronounced and the animals resist; but recovery is only apparent, and the subjects which seemed cured succumb a few weeks later to pulmonary lesions (lung disease).

Finally in others, different symptoms, less constant, but no less important, are observed; it is not rare to see, *in cases with rapid evolution*, the diarrhœic matters mixed with a varying quantity of blood. The *slow forms* of the disease are frequently accompanied with acute arthritis or synovitis, multiple and very painful.

The lesions found at the post-mortem are those of an hæmorrhagic septicæmia, whose severity varies much, according to the rapidity of the disease; there is one which is never missing; it is located on the umbilicus and the umbilical blood vessels.

The bacteriologic study of these lesions shows them to be invaded with a great number of various microbian species. Whatever may be the origin of the culture—blood from the heart or umbilical clots, liver, spleen, kidneys, lymphatic glands—all the medias, liquid or solid, which have received it, gave abundant growth of various microbes, among which different varieties of coli-bacilli much predominate.

However, in the cases with a very acute march, which are studied immediately after death, the blood from the heart gives pure or nearly pure cultures of a *Pasteurella*, which experimental study permits us to consider as the specific agent of the infection. The same *Pasteurella* is found, more or less readily, in all the other forms of the disease, principally in the articular exudates, when they are present.

The intravenous inoculation of a small quantity of this Pasteurella will be followed by an exact reproduction of the clinical and necroscopic manifestation of the acute forms of "*white scour*"; nothing will be missing, except the umbilical lesions; those can be easily obtained at the same time the others are; all that is required for it is to rub the umbilical wound of a newly-born calf with a little of the culture of the Pasteurella—(Moussu, Lesage and Delmer.)

Whatever may be the door of entrance of the specific microbe, it pullulates in the organism, and gives rise to a general infection, which may kill the calf in a few hours: it is then a *pure Pasteurellose*, in septicæmic form; if the subject resists several days, which is the rule, the organism, deprived of its means of defence by the paralyzing action of the toxines of the Pasteurella, becomes the prey of numerous secondary infections, proceeding from the lung and specially from the intestines; hence the various manifestations of "*white scour*"; finally, in the rare cases where the subject resists the intestinal infection and recovers from "*white scour*" the pulmonary infection keeps on in its slow development and finally ends in establishing the massive lesions which characterize the "*lung disease*."

Like similar affections which prevail a little all over the world, "*white scour*" proceeds from an umbilical infection; it takes place at the time of birth, through the wound resulting from the rupture of the cord; it is comparatively easy to prevent it by disinfection of the umbilicus immediately after birth and closing the door of entrance with a thick coat of antiseptic collodion.

This simple treatment has already given excellent results, not only in Ireland, but in Scotland, France and Belgium.

* * *

Under the name of *infectious pneumonia*, veterinarians designate a variety of pneumonia which often prevails in large stables under an epizoötic form.

Schutz had isolated from it a bacteria, taking the Gram, often associated two by two, which for a long time has been con-

sidered as the agent of the disease. MM. Chautemesse and Delamotte, during an epizoötic among some artillery horses, had isolated from an hepatized lung, a streptococcus which they considered as specific.

Ligniéres, undertaking that study, first showed that the diplobacteria of Schutz was nothing else but a very short streptococcus which, with that of Chautemesse and Delamotte, he proved to be identical to the streptococcus of distemper in the horse. Then, by a series of researches, truly wonderful in their ingeniosity, he showed that this streptococcus of distemper, always present in the respiratory tract of healthy horses, did invade the hepatized lung only under the influence of the organic depression produced by the toxines of a Pasteurella identical to that of typhoid fever. Here, again, the secondary infection which impresses on the pulmonary lesion its specific characters, most often conceals the primitive, which is, however, the indispensable condition of its apparition.

* * *

By these few examples, taken among many others, one can judge of the important part played by Pasteurellas in a great number of serious diseases and also of the new horizon that opens to us the notion of a group of microbes whose most constant characteristic is to assist and promote the invasion of the organism by a multitude of vulgar microbes, ordinarily harmless, which proceed from the lung or the intestine.

I do not think that I advance too much in saying that this new notion, which has already given such handsome results in veterinary pathology, will give just as fine ones when it is applied to the study of the diseases of man.

We acknowledge with thanks a kind Christmas remembrance in the shape of a most unique paper-cutter from that loyal veterinarian, Dr. W. T. Monsarrat, of Honolulu, Hawaii. We trust we may frequently have occasion to use it in opening communications from him for Review readers, as there are many interesting topics in his delightful country that would make splendid reading for our American subscribers.

ROBERT KOCH AND HIS CRITICS.

A STUDY IN THE CONTROVERSY OVER INTERCOMMUNICABILITY OF TUBERCULOSIS.

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PART I.

THE CONTROVERSY OVER INTERCOMMUNICABILITY OF THE DISEASE.

(1) *Koch's statements of July 27, 1901, and the immediate results.*

Whatever may be the conclusions of the future on the transmissibility of the disease, the 27th day of July, 1901, will be forever memorable in the history of tuberculosis, for it was then that Geheimrath Professor Koch, of Berlin, gave the results of his most recent studies in tuberculosis. From a consideration of these results the bald conclusion was reached by the medical press: (1) That human tuberculosis was not transmissible to cattle; (2) nor that of cattle to man; and, (3) there was no need of such strict sanitary precautions against the conveyance to man of the disease through milk and meat. In 1901 Koch wrote for his speech before the London Congress: "A number of young cattle which had stood the tuberculin test, and might therefore be regarded as free from tuberculosis, were infected in various ways with pure cultures of tuberculosis bacilli taken from cases of human tuberculosis; some of them got the sputum of consumptive patients direct. In some cases the tuberculosis bacilli or the sputum were injected under the skin; in others into the peritoneal cavity; in others into the jugular vein. Six animals were fed with tubercular sputum almost daily for seven or eight months; four repeatedly inhaled great quantities of bacilli which were distributed in water and scattered with it in the form of spray. None of these cattle (there were 19 of them) showed any symptom of disease, and they gained considerably in weight. From six to eight months after the beginning

of the experiments they were killed. In their internal organs not a trace of tuberculosis was found. Only at the places where injections had been made small suppurative foci had formed, in which few tuberculosis bacilli could be found. This is exactly what one finds when one injects dead bacilli under the skin of animals liable to contagion. So the animals we experimented upon were affected by the living bacilli exactly as they would have been by dead ones; they were absolutely insusceptible to them.

"The results were wholly different, however, when the same experiment was made on cattle free from tuberculosis with tubercle bacilli that came from the lungs of an animal suffering from bacillus tuberculosis, after an incubation period of about a week. The severest tubercular disorders of the internal organs broke out in all the infected animals. It was all one whether the infecting matter was injected under the skin, or into the peritoneal cavity, or the vascular system. High fever set in and the animals became weak and thin; some of them died after a month and a half or two months. After death, extensive tubercular infiltrations were found at the place where inoculations had been made, and in the neighboring lymphatic glands, and also far advanced alterations of the internal organs, especially the lungs and the spleen. In the cases in which the injection had been made into the peritoneal cavity, the tubercular growths which are so characteristic of bovine tuberculosis were found on the omentum and peritoneum. In short, the cattle proved just as susceptible to infection by the bacillus of bovine tuberculosis as they had proved insusceptible to the infection of human tuberculosis." *

Such were Koch's statements in 1901. How different were his observations in 1882, when he issued his classic work on "The Etiology of Tuberculosis," may be seen from the following, taken from the *Berliner Klinische Wochenschrift* of that year: † "Tuberculosis of the domestic animals," he says, "and

*Vide *Lancet* II., 1901, or AMERICAN VETERINARY REVIEW, 1901.

† *Berliner Klin. Woch.*, 1882. P. 230.

especially bovine tuberculosis is undoubtedly another source of infection. This fact indicates the position which, in the future, hygiene must take in connection with the danger of the flesh and milk of tuberculous animals. Bovine tuberculosis is identical with human tuberculosis, and is thus a disease transmissible to man. It must therefore be treated like other infectious diseases transmissible from animals to human beings. Be the danger which arises from the consumption of the flesh or milk of tuberculous cattle ever so great or ever so small, it exists, and it must therefore be prevented. It is sufficiently well known that anthrax flesh is often consumed by many persons for a long time without any injury resulting, and yet no one concludes therefore that the traffic in such flesh ought to be permitted."

"With regard to the milk of tuberculous cows, it is worthy of remark, that the extension of the tuberculous process to the mammary glands is not seldom observed by veterinary surgeons, and is therefore quite possible that in such cases the tuberculous virus may be immediately mixed with the milk."

(2) *Koch's modifications of statements made at the Congress in London.*

As men had in mind these utterances of Koch in 1882, which, together with the results of his investigations at that time, had largely tended to rear sanitary law against the dread disease and had set in motion preventive measures, they were indeed alarmed for public safety at the nullifying statements of 1901. Indeed, the celebrated bacteriologist was constrained to salve the disquieted public by issuing a modified statement almost immediately, August 24, 1901. He said: "I have no claim to either priority nor monopoly to my ideas propounded in the address, but I sought only to tell of my own private experiments, and was, in fact, glad of the opportunity given to mention my contemporaries in some of their experiments, among whom was one of America's greatest medical authorities, Dr. Theobald Smith." Regarding the danger of infection from tuberculous cattle he had said: "I should estimate the extension

of infection by the milk and flesh of tuberculous cattle, and the butter made from their milk, as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it." He now in his modified statement said: "I did not mean to recommend the abandonment of comprehensive and expensive systems of regulation, prevention and inspection that are now in operation. I simply said that it was injurious and unnecessary to go further with such systems when we were justified in expecting that our life-long remedy was found and almost within reach. Why, then, should we rear higher structures which must inevitably fall to the ground." *

(3) *The first outburst against Koch: criticism of his hastiness, false inferences from experiments and the evil effect of his premature statement.*

It is the pride of men of science that they hold such an allegiance to truth that they must sacrifice any previous statement based on what facts they had in hand, when they have obtained fuller knowledge. They must do this whether the new knowledge they have obtained flatly contradicts any previous statement. That man is bold who will do this, as Koch did, when he knows his previous dicta are held as truth by well-nigh the whole scientific world. Nevertheless the first outburst against Koch in 1901 was, I think, justified when it was urged that his judgments were hasty, that the inferences from his experiments were partly, at least, false, that his experiments were insufficient to demonstrate the conclusions he reached and that his premature and ill-advised statements would have an evil effect. Ravenel of the University of Pennsylvania, himself a delegate to the London Congress, wrote to the editor of the *Philadelphia Medical Journal:* † "The sensation of the meeting was Koch's ill-advised and unfounded dictum on the uselessness of the precautions against the transmission of bovine tuberculosis to man. It has raised universal opposition among those who *work*. Lord

* *Medical Record*, 1901. P. 301. Aug. 24, 1901.
† Aug. 24, 1901. P. 284.

Lister followed him in a strong protest against his conclusions, and after him Nocard, Bang and Sims Woodhead. The next day at the general meeting, Professor McFadyean read his paper. I think he demonstrated the fallacy of Koch's views. I have spoken to many men of almost all nations and all condemn the method of his announcement, as well as the insufficiency of his grounds. I am told on responsible authority that even the Germans are against Koch's view. All the papers read by the German delegates showed that they held views opposed to Koch. . . . . I have visited the State Veterinary School at Brussels and spoken with most of the leading men there. Without exception they oppose Koch's views, and Professor Gratia said to me, 'He has made *trouble for all the world*.'"

In the same vein the *New York Medical Record*, under the caption "Koch's Alleged Discovery" said, "How great the harm may be, if Koch is wrong, may be judged by the head-lines in the New York *Herald*, July 27, 1901, 'Professor Koch's New Discovery—Bovine Tuberculosis Not Transmissible to Man, and Very General Fear Unfounded—No Harm to Use Milk or Meat—Diet, from Infected Cattle, German Bacteriologist Holds, Can be Consumed with Impunity.'" The *Medical Record* continues, "the keen searching after exactness of the scientist has been dulled in Koch more or less as was shown in the matter of tuberculin . . . . . and in that of his assertions regarding malaria. He has lost the caution of the real scientist and has put on the assumption (the cocksureness we are tempted to say) of the *poseur*. He asserts with positiveness what men like Adami and Theobald Smith suggest with caution. . . . . Theobald Smith, in 1898, made a communication to the Association of American Physicians in which he described a number of experiments showing marked differences between the bacilli and those of bovine tuberculosis. The differences were morphological cultural and the results of inoculation, and were sufficient to warrant the belief that the diseases were distinct though possibly allied affections. He gave as his opinion 'the occasional entrance of bovine bacilli

into the human body might open the way for the introduction of a virus of a higher level.' Adami also, while not denying the possibility, and indeed arguing that it should be accepted for prudential reasons, yet admits that the evidence of direct transmission from animal to animal 'is singularly slight.'"

In thus speaking of the work of Theobald Smith and Adami, and it well might have mentioned others well-nigh as important, the *Medical Record* touched upon one of the chief faults of Koch—his unwillingness to fully and honestly accredit the work of others in the same field of labor. And no less a person than Adami himself scores him for this form of dishonesty. In the *Canadian Journal of Medicine and Surgery** he said: "It is very possible, and it happens not infrequently, that an active worker and writer occasionally, and by accident fails to credit his fellow-workers; but when the failure to acknowledge the observations of others is frequently repeated, no excuse can be asked or can be accepted. Either the individual who commits the crime is absolutely callous and has callously determined to aggrandize himself at the expense of others, or he suffers from a form of disease—megalomania, by which we mean that such an individual becomes so full of his subject and of himself that he regards every fact and every idea as his own whether the idea has previously been enunciated, or is the natural and independent development of his own line of work and thought, or has been, in the first place, obtained from the work and writing of others. We are inclined to think that the second is the more probable explanation in the case of Professor Koch. When, for example, he announced the discovery of tuberculin he has not a word to say with regard to the observations of other workers who had previously investigated the action of the products of the growth of the tubercle bacillus, among whom I may mention Crookshank of London, and, if I mistake not, Büchner of Munich. He took all the credit to himself. When next he described (and described imperfectly) his method of the preparation of tuberculin, no credit

* See *Med. Rec.*, Nov. 23, 1901, or *Canad. Jour. of Med. and Surg.*, Oct., 1901.

was given to Roux or Nocard for the discovery that the tubercle bacillus would grow in media to which glycerin had been added, glycerinized broth being the medium from which he prepared the tuberculin. When, later, he gave his observations on the chemical nature of tuberculin not a word was said about the previous observations of Hunter and others who had before him reached practically identical results, and, indeed, had made further researches. Only recently, taking up the subject of malaria, he has had the hardihood to take to himself all the credit for the discovery and the important part played by mosquitoes in the propagation of this disease and has refrained from saying a word of due praise concerning the prior observations of Ross, and Italian and yet earlier American workers. These facts are well known to those conversant with bacteriological literature, but such is Professor Koch's power and influence in Germany that younger men dare not disclose these matters in the public press for fear lest their careers should be injured while his colleagues of professional rank say nothing about the matter fearing lest their motive should be considered one of jealousy. It is left to those of other nationalities to bring forward these facts unpleasant as they are."

Great as have been his accomplishments as a bacteriologist, these impeachments of Koch as a scientist and as a man by leaders in Canada and the United States in the same field of labor, give us a key to the understanding of his weaknesses and failures. Vanity, which is a common blemish of many minds, otherwise great, led him to take the occasion of the London Congress to voice opinions as hasty in themselves as they were alarming to the public. There is no doubt now that the data upon which he grounded his conclusions were insufficient. Just as in 1882 the students of tuberculosis had readily accepted his conclusions, so now in 1901 they as readily denied his new dictum.

(4) *The appointment of King's commissioners on tuberculosis: questions to be studied by them: character of the appointees.*

How great was the alarm in the country in which the pro-

nouncements were made, is evidenced by the immediate appointment by Edward VII of a King's Commissioners on Tuberculosis to inquire and report: 1, Whether the disease, tuberculosis, in animals and man is one and the same; 2, whether animals and man can be reciprocally infected with it; 3, under what conditions, if at all, the transmission of the disease from animals to man takes place, and what are the circumstances favorable and unfavorable to such transmission.* To this commission was appointed Sir Michael Foster, the physiologist, who "with his unrivalled and encyclopædic knowledge and with his matured judgment is a tower of strength"; Drs. Sidney Martin and Sims Woodhead, who "as representing the clinical and laboratory aspects of the inquiry" might well be depended on to gauge the nature of all the practical operations involved in an experimental inquiry; Professor McFadyean, the Principal of the Royal Veterinary College, London, who would add his special knowledge of bovine tuberculosis; and Professor Rupert Bryce with his business capacity and technical laboratory knowledge.† The answers to the explicit questions set to them, as the London press observed, involved some of the gravest questions in infection. What is the difference between a natural infection and an experimental inoculated disease? In both instances, under presumably favorable conditions for infection, the margin of failure is notoriously wide. It is possibly associated with the degree of natural resistance or relative immunity exercised by the host towards the invading parasite. Perhaps the degree of resistance may be connected with the particular breed of animal, with its food, or with its hygienic surroundings. Again, it would be of importance to possess some accurate information on the *limits* of morphological and physiological variations possessed by the tubercle bacillus. What is its natural distribution and what are its relationships, if any, with certain other organisms of closely allied morphological structure? ‡

Closely following, and in some cases accompanying, the crit-

* *Med. Record*, 1901 P. 501. Sept. 28, 1901.
† Vide *Lancet* II, 1901. P. 738.
‡ Supra cito.

icism of the character of Koch came the criticism of the contents of his speech. These criticisms emanating under their own signature from the leading savants in Germany, France, Great Britain, Canada and the United States, together constitute a fusillade of questionings such as seldom appear from the scientific body of searchers after truth. There is in them a questioning of methods, a revaluation of data, a keenness of dialectic which cast doubt on the work of Koch, in this particular, from every view-point. There was not wanting men like Rudolph Virchow, that superb figure in pathological science, to point out his errors in pathological histology, like von Baumgarten to show his errors in pathogenesis, like Ferdinand Hüppe who disputed his bacteriological interpretations, like McFadyean who demonstrated the fallacy of his reasoning, like Lister who explained that his hypothesis was groundless, like Copeman who saw Koch's omissions, like Nocard who denounced him for belittling the dangers from bovine tuberculosis.

(5) *The criticism of Koch's statements.*

(A) IN GERMANY.

R. Virchow.

Rudolph Virchow, at the time Koch made his statements, was a Professor in Berlin and unrivalled throughout Germany, and the world for that matter, in pathology. Of Koch's enunciations he said, "On the whole I do not agree with him. In a discourse which I recently gave at a meeting of the Berliner Medicinische Gesellschaft I left no doubt concerning my standpoint on the matter. I would point out that Koch, in summarizing the results of his investigations, disregarded the conclusions for which we are indebted to the Copenhagen School. . . . . I may refer to our enactments concerning quarantine; for example, in illustration of our indebtedness to the scientific work of the Copenhagen School. The conclusions arrived at by the Danish scientists are very different in character from those of Professor Koch. The question is anything but settled." * In

* *Berliner Lokal Anzeiger*, July 26, 1901.

the *Berliner Klin. Woch.** Virchow wrote: "I will only observe in this connection that Professor Koch has perhaps gone too far in the exclusion of all those cases in which transmission of bovine tuberculosis to man, might possibly have taken place through food. As a matter of fact we have had from time to time an occasional case in the material of the Charité Hospital, and several specimens have been preserved which showed a very unusual evidence of peritoneal tuberculosis and in which there were formed such enormous growths as do not usually appear in man. We have regarded each case with suspicion, and we shall continue to do so. Therefore I deem it possible that the negation of Koch may perhaps admit of refutation in the future." Besides, Virchow denounces Koch's loose manner of pronouncing pathological growths tubercles without minute examination. "I might remark here that it seems to me that we cannot call anything tuberculosis in which tubercles do not grow in that form by which they prove themselves pathologic—anatomically, true tubercles; but not everything in which tubercle-bacilli are found should be called a tubercle offhand. . . . . In this connection I take liberty again of emphasizing to you that, according to my conception, a tubercle is not merely a thing in which there are tubercle bacilli, but is built up of cells which are called tubercle cells, that is, there is present in the tubercle an organization of structure which has grown out of its own body even though it may have arisen by the irritation of tubercle bacilli. But tubercle bacilli are not a productive (formative) element in themselves; the formative element must be cells which have been produced from the living body itself. * * * * The difficulty in the way of a clear differentiation is principally that we believed we could call a structure containing the bacilli in question a tubercle without further investigation. . . . . Even the anatomical *wart* has been considered a tubercle because here and there a tubercle bacillus had by chance been found in microscopical sections of an anatomical excrescence of the skin."

* Aug. 5, 1901

Von Baumgarten.

Professor P. von Baumgarten of Tübingen, an authority on the biogenesis and morphology of the tubercle bacillus, has written much of late on the relation between human and bovine tuberculosis. In part he agrees with Koch, but on the whole the drift of his thought is in opposition to him. In the *Berliner Klinische Wochenschrift* * he says: From a number of experiments by himself and Dr. Gaiser, and because of a critical study of all the literature, he comes to the conclusion, thus far no absolutely unimpeachable instance of successful transmission of human tuberculosis to cattle has been recorded. Twenty years ago Rokitansky in his Institüt had attempted to verify his ideas on bacterio-therapy, *i. e.*, the experiment of healing otherwise hopeless patients by the inoculation of certain bacteria. Since that time, in many instances of malignant disease in human beings, attempts had been made to cure by inoculation, for example, of virulent cultures of erysipelas.

In six selected cases of hopeless malignant tumor Rokitansky had tried the experiment of inoculating tuberculosis to see if the diseases contracted one another. At that time the idea was current that human and bovine tuberculosis were identical. They happened to have no virulent cultures of human bacilli available, so they used perle disease bacilli, which had been proven highly virulent for rabbits. Although considerable quantities of tubercle bacilli were injected subcutaneously, there was no infection—nothing of a tuberculous nature either local or generalized was observable. Most critical microscopic and macroscopic examinations of the adjacent lymph glands, as well as of the tissues of the different organs through which the malignant disease had become disseminated, failed to reveal tubercles or tubercle bacilli. These inoculations of human subjects with highly virulent perle disease bacilli proved as negative as did Professor Koch's inoculation of cattle with human bacilli, though most of the human subjects under consideration survived inoculation from several months to over a year. For a

* No. 35—Sept. 2, 1901.

long time now the teaching of Rokitansky of the exclusion of tuberculosis by carcinoma has been abandoned.

However, in spite of the fact that the above experiments were negative, he says the identity of the two diseases should not be ignored without futher investigation of the subject, because : (1) Acute miliary tuberculosis can be produced in cattle by infection with bovine tuberculosis, the same as it occurs in man from human tuberculosis, cannot be doubted by morphologists ; (2) by certain external influences (iodoform vapor) the human tubercle bacillus can be modified in its pathogenic power as to produce the typical form of perle disease in the rabbit has been demonstrated by Fangl and Troje. It follows that the bacillus from perle disease can cause typical miliary tuberculosis and that human tubercle bacilli can produce the characteristic form of perle disease. (3) The bacilli of human and bovine tuberculosis are morphologically and culturally identical. (4) Pathogenic power is well known to be one of the most variable characteristics of pathogenic bacteria. He has seen pure cultures of human tuberculosis which showed rapid growths upon glycerine-agar and upon potato soil, but which, nevertheless, were powerless to infect the smallest rabbit, though in former generations they invariably caused the death of rabbits and guinea-pigs. (5) Pathogenicity can be often increased by passing the bacilli through different animals. In rabbits the virulence of tubercle bacilli derived from bovines can be increased by successively passing them from animal to animal. (6) The bacilli of man and ox may be attenuated from long sojourn in chicken. The bacilli which have for countless generations perpetuated themselves in bovine or human organisms, have thereby acquired that which render impossible their propagation in a soil to which they have become strangers. Von Baumgarten prefers, therefore, to accept the view of Lister and Nocard rather than the less tenable doctrine that in different species of animals we have to deal with different species of tubercle bacilli which are sharply and permanently differentiated from each other and not transferable. Though he has never

considered the danger from animal food very great, yet he thinks the measures of prevention should not be relaxed.

In a more recent paper, written as late as January, 1903, in the *Journal of Tuberculosis*, he speaks of the instability of any doctrine of transferability or non-transferability in Germany. The degree of importance attached to the relation between human tubercle bacilli and bovine tubercle bacilli, he says, is witnessed by the fact that The Imperial Health Bureau in Berlin has inaugurated the control of the experiments of Professors Koch and Schütz upon a large scale. The plan of these experiments was formulated last spring with the coöperation of many tuberculosis experts, and they are now in full progress. In other hygienic and pathological laboratories investigations of the subject are being diligently carried out. Such experiments, for which especially, appropriations have been made, are also in progress in von Baumgarten's Institute at Tübingen.

The chief object of all these experiments will undoubtedly be to determine whether, by the inoculation of calves with human tubercle bacilli from as many different sources as possible, and more particularly from primary tuberculosis of the intestinal tract, under any circumstances, the transmission of human tuberculosis to cattle is possible.

F. Hüppe.

No greater acumen has been shown by anyone; neither has a more perspicuous argument couched in the most pungent phraseology been brought forward than in the criticisms of Ferdinand Hüppe, the celebrated Austrian bacteriologist. He has written two scathing reviews on Koch's position, one called "Tuberculosis, Bovine and Human,"* the other "View-points and Problems in the Study of Tuberculosis."† At one time, he says, the public peace of mind is disturbed by the display of the heaviest scientific artillery, backed by conclusive laboratory experiments, and then all at once the public peace of mind is again disturbed by still more conclusive laboratory experiments prov-

* *Lancet* II, 1901. August 31, 1901.

† Wien. Med. Woch., 1902, 1 and 2.

ing the very opposite. It cannot be known whether Koch's inference was premature because the experiments were not carried far enough. . . . . The breed of the cattle that the human bacilli did not effect is still to be precisely ascertained. Even in this matter one must proceed cautiously. When it was proved by the researches of Bollinger, Vitt and myself that what had been previously regarded as splenic fever of swine was a different septicæmia produced by quite a different bacterium, the opinion was entertained that splenic fever did not affect the pig, and yet some breeds may be successfully inoculated with the disease. . . . . The accounts that have hitherto been made public lead me to believe that Koch's experiments have not been carried far enough to justify his conclusions, and I must expressly keep open the possibility that the human tubercle bacillus may, perhaps, be able to infect some breeds of cattle, especially as before the discovery of the tubercle bacillus, Bollinger had once with tubercular material from the human subject produced true bovine tuberculosis in the calf. . . . . Koch once more draws all the fallacious inferences which arise from regarding an inoculated disease as a natural infection. And yet these things have little to do with one another, as we know from a laborious work of 40 years. The tubercle bacillus of man has no hold on the ox, consequently the tubercle bacillus of man and the ox are different species! It is the same fallacious inference as Mafucci and Koch arrived at in connection with the difference of bacteria of mammalian and avian tuberculosis. These bacteria really show in their cultures distinct differences such as are not found in bacilli of different species occurring in mammals. Nevertheless they belong to one species as obvious modifications dependent on differences of nutrition and situation. F. Feschel and myself have by purely cultural methods changed the one modification into the other, and have so altered them that mammalian tuberculosis took effect in fowls and the bacilli of avian tuberculosis took effect on mammals.

In his more mature thought on View-points and Problems in Tuberculosis, he writes in 1902: Whoever thinks of noth-

ing but bacilli in this warfare has already missed the connection between the latter and the social problems of hygiene. Other circles besides our own have come to a clear understanding that one must consider the tuberculous individual himself along with a study of the bacteria in the case. Baumgarten, for instance, still looks at matters from the purely bacteriological standpoint; for he regards the differences in the histological structure of tubercle as dependant purely upon the virulence of the bacteria and looks upon slight virulence as equalizable only through an increase in the number of bacilli. . . . . Thus far we possess no means of fashioning the virulence of the tubercle bacilli at pleasure and can neither increase nor decrease virulence. On the other hand we often obtain our first idea of virulence from the histological findings. . . . . No one has ever counted the living bacilli and our quantitative appreciation of the germ has been in connection with dried bacilli, only partly controlled. We do not know how many of the latter are dead or non-virulent. Nor can we determine how many are alive and infectious. . . . . Virulence is only a relative term and does not comprise all the factors which are of importance for an act of infection. The infectiousness of a pathological microörganism depends on the entire metabolism in relation to the species of its host. . . . . A tubercle is an anatomical nodule which may be produced by the most heterogeneous irritants and which demonstrates nothing beyond the fact that the mechanical makings of the tissue is especially adapted for the formation of nodules. But the subject of tubercles does not exhaust tuberculosis; nor do retrograde metamorphoses, caseation and calcification; for in the same lung along with tubercles, caseation and calcification, there occur superficial, exudative inflammatory processes, as Orth has recently told us. . . . . Koch will see nothing that has happened in the last twenty years; he does not, will not know anything but the bacillus. The bacillus is everything. . . . . My personal material shows that from 25-30 per cent. of all deaths from infantile tuberculosis are due to intestinal localization. Professor Heller of Kiel has the same percentages. It

appears therefore certain that by far the greater number of cases in children come from tuberculous cows.

The opinions of Rudolph Virchow, Professor von Baumgarten and Ferdinand Hüppe represent well German thought of to-day on the disease. Clearly it is not in accord with that of Koch. We shall see that the French are as much opposed to Koch as the Germans themselves.

(B) IN FRANCE.

Nocard.

From the leading veterinary school in France and from its most famous professor we would expect an answer to Koch, whether the answer contain similar views or not. Small wonder is it that Nocard stands staunchly against Koch, whose thought does not at all tally with his observations and experiments. In Nocard's latest paper, written late in 1902,* we may find his most recent thought.

"*Variation in Virulence of Bovine Tuberculosis.*—It was known that the ox in health is resistant to human tuberculosis; attempts at inoculation fail most frequently; but they succeed sometimes, and then the lesions are analogous to the natural form of the disease. . . . . For my part I have experimented with cultures of human tuberculosis of three different origins. All three were virulent for guinea-pigs and rabbits; one of them killed quickly sheep, goats and young pigs, by intravenous inoculation of a feeble dilution. I have not succeeded in killing a single healthy bovine, whether by intravenous inoculation, by injection into the mammary gland during lactation, or by ingestion of notable quantities of these cultures. However, Thomassen, Ravenel, Karlinski, Delépine, Arloing, Klebs et Rievel, de Jong, Pretlner, Schottelius, Max Wolff, Fibinger et Jensen and others have brought forward new examples of human tuberculosis transmissible to bovines. For the formula of Koch 'The ox is refractory to human tuberculosis,' it becomes necessary to substitute this: the ox is refrac-

* *La Revue Générale de Méd. Vétér.*, vide, *Vet. Record*, Jan. 17, 1903.

tory to certain strains of human tuberculosis, whilst it is receptive to certain others. This amounts to saying that there is not *a* human tubercle bacillus but several of widely varying virulence amongst which are some which overcome the really considerable resistance of the bovine. And the same may be said of other forms of tuberculosis. In bovines one finds bacilli of varied virulence even for cattle. Some induce a generalized infection ending fatally in a few weeks, some give rise to only a few local lesions which develop only very slowly, and which remain for months and years compatible with all the appearance of health. If, then, one works with a single type, taken from one source only, the results obtained, however numerous the experiments, have only the restricted value of an isolated experiment. With our present knowledge it seems well established that the difference of virulence observed between the tubercle bacilli of the different species point to a gradual adaptation more or less complete to their environment."

"*Transmission by Milk.*—Milk, like flesh, is rarely dangerous at all, except when it comes from a tuberculous udder, but in that case it is highly dangerous for it may contain immense quantities of bacilli. M. Koch does not admit the reality of this danger; against the frequency of the bacilli in milk and butter on sale in towns, he sets the extreme rarity of primary intestinal tuberculosis — the only lesion, according to him, which indicates an infection of alimentary origin. . . . . The contention that primary intestinal tuberculosis is the only indication of alimentary infection can no longer be admitted. All who have experimented know that the bacillus may invade the mucous membranes at any point. Tuberculosis of the tongue, of the sub-maxillaries, the sub-glossal and sub-pharyngeal glands proceed most frequently from an inoculation of the bucco-pharyngeal membranes. In the guinea-pig this is the principal seat of infection from food. Almost always ulcerations of the pharynx are found, whence the bacillus invades successfully the whole chain of glands. In the majority of cases the parotidean or cervical are attacked in the calf, pig,

cat, rabbit, when fed on tuberculous material. And when abdominal tuberculosis is slowly developing, it is not surprising to find lesions of lungs and bronchial glands."

Arloing.

After Nocard, there is no man in France who knows as much about bovine tuberculosis as M. S. Arloing, of Lyons. His experiments are as careful and as ingenious as those of Nocard, and the two scientists are often coupled together in medical literature, as equals in research. Shortly after Koch's speech he wrote an elaborate review in the *Revue de la Tuberculose*, August 1901, in which he concludes: (1) The criticism arrived at by M. le Professeur Koch, when he declared that human tuberculosis was different from bovine tuberculosis, is too rigorous. (2) The facts that I have recalled from my experiments with the ass and the goat, demonstrate that the virulence of the bacillus of tuberculosis is frequently modified in the organism of a special animal, and also that it adapts itself to this or that living medium by a series of successive transmissions. (3) Consequently one should expect to find between the B. of Koch established upon diverse species of animals, differences and peculiar changes in their virulence. (4) But these variations do not change the fundamental property of the bacillus, which is able always to return at one moment or another to a typical intensity. (5) M. Koch has as much as admitted this in his experiments when attempting to infect the pig. (6) The learned author is right when he says many experiments should be performed before positive results can be reached. (7) We should fight energetically against infection from sputum of tuberculosis; but we should not relax measures which, if relaxed, would permit of infection by milk and meat of animals.

(c) IN GREAT BRITAIN.

Lord Lister.

When Koch had finished his address in London he was immediately answered by the British representatives; later, he was answered in the medical press. Lord Lister, President of the

Congress, at once disagreed with him. Within a week his arguments against him were published in the *British Medical Journal* and the *Lancet*. In the one he deals with the error in Koch's views on primary intestinal tuberculosis; in the other with his erroneous conclusions generally. In the *British Medical Journal* he says: "The intestinal contents consist, of course, not only of food more or less altered, but also of the secretions of the various glands which pour their products into the alimentary tract. One such product is the bronchial mucus, which, together with the dust of the inhaled air, is brought up by the celia to the orifice of the larynx and perpetually swallowed unconsciously. The inhaled dust thus enters as truly into the composition of the intestinal contents as does the food; and in the case of a child fed on unboiled milk of a cow with a tuberculous udder in a room infested with tubercle it might be fairly open to question whether the bacillus of bovine tuberculosis imbibed at the meals or those of human tubercle from the air were the most numerous in the intestine. Hence the fact of the mesenteric glands being the only seat of tubercle in a milk-fed child is no proof that the bacilli which they contain were derived from the milk. This consideration may seem to favor Koch's hypothesis; but it, in truth, deprives his argument, based on the rarity of primary intestinal tuberculosis lesions in the child, in spite of the multitudes of bovine tubercle bacilli swallowed in milk, of any relevancy whatever."*

In the *Lancet*, the same week, he said: "What had chiefly riveted his attention had been the startling thesis that bovine tuberculosis could not develop in the human body. This was a matter of enormous practical importance; because if this conclusion were sound it would greatly simplify their preventive measures, but it would be a very serious and grievous thing if the rules now in force for the security in the purity of the milk supply be relaxed, and it should turn out after all that the conclusion was erroneous. For his own part he thought the evidence educed by Dr. Koch to show that human tuberculosis

* *Brit. Med. Jour.* II, 1901, 283. Aug. 3, 1901.

could not be communicated to bovine animals were not very conclusive. . . . . Even if it were established that human tuberculosis could not be communicated to cattle, it by no means necessarily followed that bovine tuberculosis could not be communicated to man. He took in illustration the case of variola. Attempts to inoculate human small-pox into the calf had been so very rarely successful that eminent pathologists had concluded that small-pox and cow-pox were entirely different diseases. We now know that this was an entire mistake, that cow-pox was small-pox modified by passing through the cow. He referred to some very interesting experiments by Dr. Monckton Copeman, who entirely failed to inoculate human small-pox into the calf, but invariably succeeded in inoculating it into the monkey ; and was as invariably successful when he introduced matter from pustules in the monkey into the calf, the result being ordinary cow-pox, which could be used in vaccinating children. It might be that some species of animal might serve as an intermediary host for tubercle between man and the bovine animal. Or it might turn out that, if sufficient experiments were made, human tuberculosis might prove occasionally transmissible to man, as was the virus of vaccine. The evidence, necessarily indirect, on which Koch relied as showing that bovine tuberculosis could not be transmitted to man did not seem at all conclusive. It consisted mainly in the alleged rarity of primary tuberculous internal lesions, in spite of the multitude of tubercle bacilli by children in milk. Even if it were admitted that primary tuberculous intestinal lesions were as rare in children as Koch's statements indicated, it was certainly true that tabes mesenterica existed in a considerable percentage of children who died from tuberculous disease without tubercle bacilli being found in any other part of the body. When the mesenteric glands were thus affected, without any discoverable intestinal lesion, the natural, and indeed inevitable interpretation seemed to him to be that the tubercle bacilli had passed through the intestinal mucus without causing obvious lesion in it and had been arrested in glands of the mesentery.

It was known that even typhoid bacilli, the essential place of development of which was in the intestinal mucous membrane, occasionally passed through it without producing the characteristic lesion. And if this occurred with typhoid bacilli how much more likely to occur with tubercle bacilli? If this were so, Koch's argument fell to the ground. As regards the experiments which Koch had referred to as inoculating bovine animals with material from the glands of children affected with tabes mesenterica, the result being negative, these experiments had been but few; and even were they more numerous, they could not, to his mind, be quite conclusive. It might be that tubercle from milk in the intestines might be so modified by passing through the human subject that the bacilli in the mesenteric glands, though derived from a bovine animal, might be no longer those of true bovine tubercle, but bacilli having the character of human tubercle, and disposed to develop in cattle." *McFadyean.*

Professor John McFadyean had been celebrated as an anatomist, bacteriologist and college executive; but it was not till the occasion of the London Congress that he exhibited, at least to the full, the keenness of dialectic which there distinguished him. The day after Koch's address he rose to rebut his argument.

In the beginning he thus summarizes Koch's contention: (1) The bacilli found in cases of bovine tuberculosis are much more virulent for cattle and other domestic animals than the bacilli found in cases of human tuberculosis. (2) That the difference is so marked and so constant that it may be relied upon as a means of distinguishing the bacilli of bovine tuberculosis from those of the human disease, even assuming that the former may occasionally be found as a cause of disease in man. (3) If bovine bacilli are capable of causing disease in man there are abundant opportunities for the transfer of the bacilli from the one species to the other, and cases of primary intestinal tuberculosis from the consumption of tuberculous milk ought to be of common occurrence. But post-mortem examination of hu-

man beings proves that cases of primary intestinal tuberculosis are extremely rare, and therefore it must be concluded that the human subject is immune against infection with the bovine bacillus, or is so slightly susceptible that it is not necessary to take any steps to counteract the risk of infection in that way.

Professor McFadyean, with the utmost diffidence, ventured to submit that at least one of the premises contained in this argument is not well founded, that the others have little or no bearing on the question, and that there still remains reasonable grounds for regarding tuberculous cow's milk as distinctly dangerous to human beings.

It cannot be denied that what may be called bovine tubercle bacilli are, as a rule, distinctly more virulent for cattle and other domesticated animals than are human bacilli, or that the results of experiment indicate that in natural circumstances there is little danger of cattle being infected from human beings. But it cannot be admitted that the low virulence of human bacilli for cattle proves, or even makes probable that bovine bacilli have only a feeble pathogenic power for man. That might have been held to be probable if it had been shown that bovine bacilli were very virulent only for cattle; but since it is well established that these bacilli are highly dangerous for such diverse species as the rabbit, horse, dog, pig and sheep, in short for almost any quadruped on which they have been tried, it appears to be highly probable that they are dangerous for man. At any rate, it is impossible to cite any ascertained fact relating to other bacterial diseases that makes the contrary conclusion probable. It is well known that the majority of the disease-inciting bacteria are harmful to only one or two species; but all those that are common to all the domesticated animals are also pathogenic to man.

With regard to the second view, that the difference between human and bovine bacilli in respect of virulence for cattle, is of such a fixed and constant character that it may be relied upon to distinguish the one from the other, it need only be said that that is far from being proved. It appears to be quite possible

that what may be called the normal or average virulence of bovine bacilli for cattle may be reduced by passage through the human subject. Besides there are very great differences in the virulence of tubercle bacilli found in animals of the same species; and if a low degree of virulence for cattle is to be taken as the distinguishing feature of human bacilli, there need be no difficulty in proving that the human disease is sometimes transmitted to the lower animals.

With regard to Koch's third statement—and this is the one point in Professor Koch's argument which is germane to the point at issue, viz.: That only cases of primary intestinal tuberculosis can possibly have had their origin in the infected meat or milk, and that "such cases are rare." . . . . Professor Koch offers statistics for Germany. But the statistics are by no means unanimous and those that are likely to appeal with most force to the people in Great Britain are not at all in accord with those quoted from Germany. During the last few years the evidence obtainable from the post-mortem records of two of the largest hospitals for children in Great Britain have been analyzed with great care in order to see what evidence they afforded as to the relative frequency of the different methods of infection in tuberculosis. In the case of the Hospital for Sick Children in Great Ormond Street, London, this has been done by Dr. G. F. Still, and in the case of the Royal Hospital for Sick Children in Edinburgh, by Dr. T. Shennan. The conclusion at which Dr. Still arrived was that in 29.1 per cent. of the cases of tuberculosis in children, primary infection appeared to take place through the digestive tract. That is by far from being an insignificant proposition and is a striking fact that Dr. Shennan arrived at an almost identical conclusion and estimated that 28.1 per cent. of the cases of tuberculosis in children in Edinburgh are due to alimentary infection. . . . . One would only expect to be able to trace the disease to the milk when, after the onset of symptoms, pointing to infection by way of the mouth, the cows from which the milk was obtained were still available for examination. In practice this is rarely the

case, and it is therefore not surprising that medical literature contains very few specific instances of the infection of human beings with tuberculosis by means of milk. It is obvious, however, that the entire absence of evidence of this kind would in no way exonerate milk from the suspicion of being one of the causes of human tuberculosis. *

Delépine.

Professor Delépine of Owens College, Manchester, though himself not a veterinarian, has nevertheless been one of the most earnest investigators in bovine tuberculosis. His summary of arguments which might be educed against Koch may be at point here. 1. We have cases of veterinary surgeons becoming infected with tuberculosis as a result of wounds received during the necropsy of tuberculous cattle. Several such cases are fully recorded as authentic and their existence cannot be denied. 2. We have much post-mortem evidence to support the idea that bovine tuberculosis can produce tuberculosis in children by ingestion. 3. We have evidence that tuberculosis can be communicated to most of our domesticated animals. 4. In certain animals used as test animals *c. g.*—the guinea-pig—inoculations with products from human and bovine tuberculous subjects produce a disease which has all the chief characteristics of tuberculosis in either animals or man. This tuberculosis can be almost invariably obtained and follows a definite course, as I have been able to satisfy myself in some 3000 personal experiments. 5. Tuberculin, which contains specific chemical products generated by the tubercle bacillus can be obtained from tubercle bacilli of various origins, and tuberculous cattle react to tuberculin prepared from these various bacilli.†

Edgar M. Crookshank.

Edgar M. Crookshank in an introductory address before the Royal Veterinary College, Camden Town, in the autumn of 1901, on "Human and Bovine Tuberculosis," reminded his audience of an experiment which tended to disprove Koch's posi-

* *Lancet*, II, 1901, Aug. 3, 1901—P. 301.

† *Lancet* II, 1901, 304 305. Aug. 3, 1901.

tion. He inoculated a perfectly healthy calf intra-peritoneally, in 1888, with very virulent human tuberculous sputum, and the result was extensive tubercular deposit at the point of inoculation with hundreds of tuberculous new growths extending from it. The calf died of septicæmia 42 days after inoculation, and sufficient time had elapsed for pronounced tuberculosis of the peritoneum. On microscopic examination extremely minute tubercles were found disseminated throughout the liver and lungs. Long and beaded bacilli of the human type were found in these organs and in the peritoneal deposits. Sidney Martin, Crookshank said, had similar results.*

(*To be concluded.*)

* *Lancet* II, 1901, 1176. Nov. 2, 1901.

THE MASSACHUSETTS BOARD OF VETERINARY EXAMINERS.—At the meeting of the executive council, December 9, the new board of registration in veterinary medicine established by the last legislature was appointed, as follows: Langdon Frothingham, of Boston, for five years; Elmer W. Babson, of Gloucester, four years; George Penniman, of Worcester, three years; Henry S. Lewis, of Chelsea, two years; Thomas E. Maloney, of Fall River, one year. Dr. Lewis is, so far as we know, the first colored veterinarian to receive official appointment to a public position in this country.

ANCIENT AND MODERN TROTTING PARAPHERNALIA.—Yankee, the first horse to negotiate a mile in less than three minutes, drew a cart that weighed more than twice as much as the pneumatic contraption pulled by Lou Dillon when she circled the Memphis course in 1.58½, or exactly one minute and half a second faster than Yankee's mark at 2.59, made ninety-seven years ago. Commenting on the performance by Yankee a sporting paper at the time said: "The frail gig he drew weighed scarcely 100 pounds and no one but Yankee's driver cared to trust himself on it." Lou Dillon's sulky weighed twenty-four pounds one ounce. The present trotting queen wears four shoes that will weigh scarcely one pound. She requires no artificial weight nor appliances to balance her. All of her shoes together weigh not much more than one of the front shoes worn by Maud S. She is 15.1 hands high and weighed exactly 808 pounds when she created her world's record over the Memphis track.

MENINGITIS IN HORSES, CATTLE, SHEEP AND SWINE.*

By Louis B. Wilson, M. D., First Assistant Bacteriologist, and S. D. Brimhall, V. M. D., Director Veterinary Department.

Introductory.—Meningitis in horses, cattle, sheep and swine has occurred in Minnesota in small isolated outbreaks a number of times during the last few years. The first outbreak investigated in detail by this board was that reported in the Biennial Report for 1898, page 180, in which an organism not distinguishable from *diplococcus intracelluiaris meningitidis, Weichselbaum*, was isolated from the central nervous system of a cow, the fifth to die on a farm near Rosemount. In the Biennial Report for 1899-1900, page 459, two other outbreaks in cattle were reported; one at the State Experiment Station, and the other near Lake Minnetonka. Both of these were shown to be due to *diplococcus pneumoniæ*. In the same report, pages 285 and 460, is recorded the history of an outbreak of meningitis in horses near Herman. These were typical cases (seven in all) in history, symptoms and lesions. The last inoculation experiment from this outbreak reported in the previous Biennial Report (see page 462, horse No. 3) was incomplete at the time of the writing of the report. The first portion of this experiment is herewith repeated in connection with the final results of the experiment.

Horse No. 3. Very old. Tested with mallein, May 25, 1900; no reaction. Inoculated into left carotid artery May 29th with 3.5 c.c. of twenty-four and forty-eight-hour broth culture, emulsified with twenty-four and forty-eight-hour serum culture of diplococcus of *Herman meningitis stock*, second culture from brain of horse No. 2.

Animal showed no symptoms up to and including June 15th, and remained well (no rise of temperature).

June 15, 1900, at 2.30 P. M., animal inoculated subcutaneous-

* From the Nineteenth Report of the Minnesota State Board of Health.

ly just back of left shoulder with 500 c.c. forty-eight-hour plain broth culture of diplococcus from *Herman meningitis stock* "original." (Not passed through horse No. 2.) Also subcutaneously behind left shoulder with 500 c.c. forty-eight-hour plain broth culture of diplococcus from *Herman meningitis stock;* third culture from horse No. 2.

Friday, June 22nd, specimen of pus collected from abscess on left shoulder. Abscess had opened itself within the previous hour. Direct coverslip preparations showed abundant diplococci. No other microörganisms observed.

Cultures on Löffler's serum and on plain broth after twenty-four hours in incubator showed only diplococci present.

Nothing further occurred until Sunday morning, July 8, 1900, when horse noticed by attendant to be apparently "off his feed." Sunday evening was down, making frequent efforts to rise, being apparently weak in his back. Was able to rise on his fore feet, but could proceed no farther toward getting up. Horse tried to eat while down. Temperature taken Tuesday, July 10th at 3 P. M., subnormal. Animal found dead morning of Wednesday, July 11th, still warm.

Autopsy at 9 A. M. on the same day. Congestion of vessels, particularly the minute capillaries of the pia. No marked exudate in brain. Similar congestion in vessels of cord in cervical and lumbar regions. The left lung showed numerous small nodules, some of which contained a cheesy deposit surrounded by a tough capsule. One old scar and one nodule on the nasal septem. No ulcers.

Direct coverslip and serum and broth cultures were made from the meninges of (a) the superior surface of the cerebrum; (b) inferior surface of the temporal lobes; (c) cervical cord; (d) lumbar cord. Cultures also were taken from one nodule in lung.

Direct Coverslip Preparations.

(a) From superior surface of cerebrum showed no bacteria.

(b) From base of brain, a few diplococci.

(c) From cervical cord, many diplococci.

(d) From lumbar cord, few diplococci.

(e) From various nodules in lung, no bacteria.

Cultural Examinations.

(a) From superior surface of cerebrum, no growth either in broth or on serum.

(b) From base of brain, in broth fair growth; on serum, about twenty colonies of diplococci.

(c) From cervical cord, in broth, good growth; on serum, numerous isolated colonies, all diplococci.

(d) From lumbar cord, in broth, fair growth; on serum, about twenty colonies of diplococci.

(e) From nodule in lung, in broth, very abundant growth of small unevenly staining bacilli, probably *B. coli communis.*

The results of these two inoculations (see the above and horse No. 2, page 462, Biennial Report for 1899-1900) would seem to prove beyond a doubt the ætiological relationship of *diplococcus pneumoniæ* to the disease.

The following is a detailed statement of the examinations of cases of meningitis made from Jan. 1, 1901, to April 23, 1903:

Osakis, Douglas County (Horses)—Nov. 28, 1900, Dr. Brimhall visited the farm of Mr. F. P., near Osakis, Douglas County, to investigate the cause of death in horses. Mr. P. had lost four horses in a little over a week, and a fifth had been sick, but recovered. Those which died were sick from twenty-four to thirty-six hours. As they had all been dead several days, post-mortem examinations were out of the question, but from the description given by the owner, Dr. Brimhall felt certain that the cause of death was due to cerebro-spinal meningitis.

Another man living about ten miles north of Osakis had lost five horses with what he thought was the same trouble, but they had been dying one at a time for a period of three months. The diagnosis was very doubtful.

Torah, Stearns County (Cattle)—On Jan. 12, 1901, there was received from H. Bouman, M. D., Torah, Minn., the head of a cow, the fifth to die on a farm near Torah. All the cattle

except one were yearlings. They had been fed with corn stalks and unhusked corn. The symptoms noted were about the same in all animals. They refused to eat, showed great prostration and were unable to rise after the first day. The eyes were inflamed and swollen, with considerable discharge from both eyes and nose. There seemed to be marked fever, though temperatures were not taken. One died after two days' illness, three after three days' illness and one after two days' illness.

When the head was received in the laboratory it was in good condition and on opening the skull, well-marked meningitis was present. Diplococcus pneumoniæ was found abundantly in coverslip preparations and unmixed with other organisms in cultures.

Chanhassen Township, Carver County (*Cattle*)—Jan. 20, 1901, Dr. Brimhall visited the farm of Mr. A. H., Chanhassen Township, Carver County, to investigate the cause of death of Mr. H.'s cattle. Mr. H. had originally sixteen cows and two calves. Five of the cows had died after very short periods of illness, during which they showed rapidly ascending paralysis. One cow which had been sick and paralyzed so that she was unable to get on her feet had so far recovered at the time of Dr. Brimhall's visit that she was able to stand, though with difficulty. The owner gave a very clear description of the symptoms shown by cattle and Dr. Brimhall diagnosed the disease as cerebro-spinal meningitis. Isolation of the healthy cattle and disinfection of the stable was recommended. No further trouble from the disease arose.

Faribault, Rice County (*Cattle*)—June 21, 1901, Drs. Brimhall and Wilson, in company with Dr. L. Hay of Faribault, visited the farm of Mr. S., nine miles northwest of Faribault. About the first of April Mr. S. had lost a two-months'-old calf, which at that time was being fed on milk from the creamery. About a month later he lost a six-months'-old steer, and between that time and June 21 six other cattle, eight in all, had died. There were twenty-one animals originally in the herd. About half of them were cows and the remainder yearlings or six-

months'-old steers and heifers. Five of the young cattle and three cows had already died. The owner said that all the animals exhibited practically the same symptoms. They first became somewhat stupid, had a wild staring look in the eyes and seemed slightly stiff in the back. After a short time they all became crazy, and rushed about the barnyard and attempted to bunt the other cattle and the owner. The posterior portion of the body then became paralyzed. Throughout the disease all the animals made frequent straining attempts to pass fæces; all had diarrhœa, which in most cases was bloody. The animals died in from one to four days after showing symptoms of the disease. The local "cow doctor" examined some of the sick animals and pronounced the disease diphtheria. About June 15, Dr. Hay saw one of the sick animals, which was almost dead at the time. He killed it and made an autopsy. He did not skin the carcass nor examine the central nervous system, but otherwise the autopsy was complete. No lesions were found except a slight degree of entero-colitis. June 21 a small red cow had been sick for two days, but the owner thought she was a little improved over what she had been the previous day. She presented a staring condition of the eyes with stiffness and slight incoördination of the hind legs. Her temperature was 102.5°. The owner was instructed to ship the head and neck, in case the cow died, packed in ice to the laboratory.

June 25, at 9 A. M., there was received in the laboratory a head of the small red cow described above. An examination was made at once by Drs. Brimhall and Wilson. On removing the skin a few small hæmorrhages were found in the subcutaneous tissue on sides and back of the neck. None were found on the under side of the neck. These may have been due to bruises received from the rope or chain with which the animal had been tied. The pharynx was markedly inflamed. On opening the skull the vessels of the pia were found engorged with blood and considerable pus was present in the sulci, especially near the base of the cerebrum. All of the tissues were very nicely preserved; large cakes of ice were still present in

the barrel containing the specimen when it was received in the laboratory.)

Direct coverslip preparations and broth and serum cultures were made from the hæmorrhagic subcutaneous areas and from various portions of the meninges. The upper two inches of the spinal cord divided into one-half inch segments with portions of the cortex of the left cerebrum were preserved in alcohol and formalin for histological examination. A portion of the medulla aseptically removed was used for inoculating rabbits Nos. 436 and 437. The direct coverslip preparations were stained with eosin and methylene blue. Careful search of all of them showed a few pairs of diplococci in those from the meninges. Cultures were examined after twenty-four hours in the incubator. Two broth and two serum cultures from the subcutaneous hæmorrhages developed no bacteria. Of the eight cultures from the various portions of the meninges, five—three broth and two serum—gave a growth of small, slowly growing diplococcus, which occasionally showed chains of four to eight individuals. No other bacteria were present in any of the cultures. Second cultures from the original ones from the meninges were sown heavily in the broth and on serum, and after twenty-four hours in the incubator were used for inoculation of rabbits Nos. 442 and 443, and of guinea-pigs Nos. 441 and 442.

Rabbits Nos. 436 and 437 inoculated subdurally with an emulsion of the medulla of the cow noted above, died after six and eighteen days respectively, having shown symptoms of meningitis, viz., excitement, holding of head to one side, stupor and death. The symptoms had begun thirty-six hours after the inoculation. At autopsy no lesions were present except in the meninges, where the vessels were intensely congested, and some of the sulci near the base of the cerebrum contained a small amount of pus. Direct coverslip preparations and cultures in broth and on serum showed *diplococcus pneumoniæ*, apparently unmixed with other organisms.

Rabbit No. 442 was inoculated in the left subdural space with 0.2 c.c. of the emulsion of a twenty-four-hour broth with a

twenty-four-hour Löffler's serum culture of the diplococcus, second from the original from the meninges of the cow, June 27, 1901. Only July 9, this animal began to show bilateral weakness of the muscles of the fore part of the body. There was no retraction of the head. The animal was found dead on July 11. At autopsy the meningeal vessels were found intensely congested, especially at the base of the brain. There was an increased amount of cerebro-spinal fluid. One small hepatized area was found in the right lung. The spleen was extremely small and of dark color. Direct coverslip preparations from the meninges showed diplococci. From the heart's blood no bacteria. Cultures in broth and on Löffler's serum showed many diplococci from the meninges. Those from the heart's blood gave no growth.

Rabbit No. 443 was inoculated intra-peritoneally, June 27, 1901, with 1.5 c.c. of an emulsion of a twenty-four-hour broth with a twenty-four-hour serum culture of the diplococcus, second from original from meninges of cow, also 0.5 c.c. of the same material was injected into the right nostril. July 10, the first symptoms of meningitis appeared similar to those noted in rabbit 442. The animal died July 12. Autopsy showed intense congestion in the vessels and meninges of the skull. Congestion was most marked at the base of the brain. There was considerable increase of fluid in the ventricles. The spleen was almost completely atrophied. Direct coverslip preparations from the meninges showed a few diplococci from the heart's blood; no bacteria. Cultures in the broth and on serum from the meninges showed a slight growth of diplococci. Those from the heart's blood no growth.

Guinea-pig No. 441 was inoculated June 27, 1901, in the left subdural space with 0.2 c.c. of the same material as that used in the inoculating of rabbits Nos. 444 and 443. The animal showed no symptoms at any time during the next succeeding six months, when it was used for another purpose.

Guinea-pig No. 442 was inoculated June 27, 1901, intraperitoneally with 0.5 c.c. of the emulsion of the same material

as that used for inoculating rabbits Nos. 442 and 443. The animal was also given 0.5 c.c. of the same material by high injection into the right nostril. This animal showed no symptoms during the ensuing six months, and it was then used for another purpose.

These several inoculations were undertaken to determine the possible presence of rabies virus. It would appear however that the early onset of the symptoms and death in rabbits 436 and 437; the production and symptoms of meningitis without posterior paralysis or retraction of the head by subdural and intra-peritoneal injection of pure cultures of the diplococcus in rabbits 442 and 443; and the failure to produce any symptoms in guinea-pigs Nos. 441 and 442 after similar inoculations with the same material; together with the uniform production of the lesions of meningitis and the multiplication of diplococcus pneumoniæ within the tissues of inoculated rabbits, would warrant the conclusion that the disease in the cow was meningitis due to *diplococcus pneumoniæ*, and unmixed with the virus of rabies or with other bacteria. This case would seem to be an important one owing to the difficulty sometimes experienced in distinguishing clinically between rabies and meningitis due to *diplococcus pneumoniæ*.

Lucas Township, Lyon County (Cattle)—Sept. 21, 1901, Drs. Annand and Wilson visited the farm of Mr. J. D. S., of Lucas Township, Lyon County, seven miles south of Cottonwood, Minn., to investigate an outbreak of an obscure disease. Mr. S. gave the following description of the cases: During the summer the cattle had been divided into two herds. A portion of them was kept on the farm on high rolling ground sown with rape. The other portion was in a large public grass pasture near Tracy. July 28, 1901, a cow on the home place was noticed to be sick, and died within twenty-four hours. Three weeks later, or about August 18, a calf became sick and when apparently about to die on same day was killed. Three weeks after this, or about December 8, another cow became sick and died within twenty-four hours. One week later, or September 16,

four young cattle, three of which had been brought back ten days previously from the pasture near Tracy, all became sick. Two of these at the time of the visit of Doctors Annand and Wilson were apparently better. The third was becoming slightly worse, and the fourth was almost dead. The symptoms as described by the owner were refusal of food, trembling, bellowing, "drooling" from the mouth and an entire inability to swallow either food or water. One of the animals had been apparently blind. No bloody discharges were observed from any organs of any of the animals. The two yearlings which were apparently on the road to recovery seemed somewhat emaciated and had some difficulty in swallowing, but were able to chew their cud. The third spent most of the time at the watering tank with his nose immersed in the water and made a "champing" motion with his jaws as though attempting to get the water into his mouth. It seemed entirely unable to swallow. It was very much emaciated, the eyes being notably sunken. The fourth animal was down and apparently unable to rise. It was breathing in a jerky manner as though in pain. It made no attempt to swallow, though it frequently champed its jaws. There was considerable drooling from the mouth. (The temperature of all the animals examined was normal.) The animal was killed by a blow on the head and an autopsy made at once. Careful examination of the tongue and throat regions revealed no lesions except a slight congestion in the posterior nares and throat. One-half the animal's body as well as the whole of the neck was skinned, but no hæmorrhagic areas were found. A small slightly hæmorrhagic spot was found on the wall of the third stomach. The spleen was shrunken. A careful examination was made of all of the internal organs, and no other lesions were noted except that both kidneys were on the right side of the abdomen, an apparently anatomical anomaly. The condition of the central nervous system was somewhat disguised by the method of killing—blow on head—but so far as could be determined no evidence of meningitis was present. Direct coverslip preparations and cultures were collected from

blood of the carotid artery, from lung, pericardial fluid, heart's blood, spleen, liver, and meninges.

One of the two serum cultures from the blood of the carotid artery developed one colony of streptococcus pyogenes aureus. The other culture and one of the two broth cultures remained sterile. The colony which developed may have come from the knife with which the artery was severed. The only other microörganism found in any of the cultures was a large oval spore-bearing bacillus which grew at room temperature on the surface of one of the two serum cultures made from the liver. Another serum culture from the same source showed no bacteria. These cultures were made on the open prairie with the wind blowing a gale so severe that the alcohol blast lamp was frequently extinguished. No bacteria of any kind were found in any of the direct coverslip preparations.

Oct. 5, 1901, Drs. Brimhall and Wilson again visited the farm of Mr. J. D. S., and examined several cattle sick of the disease described above. No animals were dead and it was impossible to secure any for the purpose of autopsy. Careful study was made of the clinical symptoms and despite the previous negative bacteriological findings it was thought that the disease was meningitis.

The history of the onset of the disease and the symptoms in these cases point to infectious meningitis. The normal temperature and the apparent absence of specific bacteria from the tissues of the sick animal, however, make the diagnosis of an infectious meningitis doubtful.

Crow Lake Township, Stearns County (Cattle)—Feb. 26, 1902, Dr. Brimhall investigated an outbreak of cattle disease in Crow Lake Township, Stearns County, near Belgrade. Cattle on several different farms had been dying of the disease, which presented some obscure symptoms, but resembling those described in the preceding outbreak. No cattle were very sick at the time of Dr. Brimhall's visit and none could be obtained for autopsy. From the owner's description of the symptoms and from the symptoms seen by him, Dr. Brimhall was of the opinion that

the cattle had been suffering from meningitis. Disinfection of stables, etc., was recommended and no more cases were reported.

Barden Township, Carver County (*Swine*)—Jan. 9, 1903, Mr. C. P. C. of Barden, Carver County, shipped to the laboratory three pigs of which he gave the following history: "The original litter contained nine pigs. They were born about Sept. 1, 1902, and had thriven well all the season until about the middle of December, when one was noticed having some trouble, which seemed like fits, coming on usually after they first came to the trough in the morning. They would get up to the trough and start to eat and then suddenly back up and sometimes would fall flat and breathe very hard with a grunting noise. This would last for an hour or more and then they would apparently be as well as ever. These spells became more frequent and longer in duration. The pigs died after about two weeks' sickness. Seven died, two were shipped to the laboratory along with a third healthy pig from another litter."

After arriving at the Laboratory of Animal Research the two sick ones showed spells similar to attacks of epilepsy, the smaller of the two having it much more severely. On this pig (No. 28 laboratory series), the following observations were made: The first attack came on the day after arrival and soon after having drunk water. The pig "backed up" and stood very stiffly. He made a peculiar grunting noise with each short, gasping respiration. This was quite typical of all the attacks, but after an attack which occurred on the 31st he breathed freely, but continued to show the short, grunting respiration. Animal was somewhat stiff all the time. Later the respiration seemed to improve, but the hind legs became weak and sufficiently paralyzed so as to prevent the animal from standing up. Temperatures were taken as follows: January 12, 103.8°; January 14, 103°; January 19, 104.3°. The pig was killed January 20 for the purpose of autopsy. No lesions were found except a small hæmorrhage in larynx at the side just above the cricoid cartilage. The pia at the base of the medulla was somewhat hæmorrhagic. Cultures from the lumbar cord and kidney showed no growth. Those

from the medulla, liver, heart's blood showed diplococci; from the spleen a large nonmotile bacillus (probably a contamination).

Rabbits Nos. 664 and 684 were inoculated intravenously and subdurally respectively, with cultures of the diplococcus from this case, but showed no symptoms during the ensuing two months, after which time they were used for other inoculations.

The other sick pig, No. 30, laboratory series, presented much the same symptoms as its companion. January 12 its temperature was 104.8°; January 19, 104.6°. Died January 24. Autopsy showed no gross lesions except marked injection of the mesenteric vessels, a few collapsed areas in one lung and some evidence of meningitis. Cultures from the heart's blood showed no growth; from the kidney, liver and spleen streptococci in short chains; and from the meninges diplococci and streptococci.

From the facts above given it would seem that both pigs were suffering from infection of *diplococcus pneumoniæ* with a secondary infection of streptococci in one of the animals. The low virulence of the organism may account for the somewhat chronic nature of the disease. The cases are, however, too few to warrant the drawing of any sweeping conclusions.

Hayward Township, Freeborn County (Horses)—Jan. 8, 1903, Dr. Annand visited the farm of Mr. G. P. T., three miles east of Glenville, Minn., Hayward Township, Freeborn County, to investigate a disease of horses.

Beginning about three weeks prior to the onset of the first symptoms Mr. T. had fed his horses on ensilage. On opening the silo some of the material from the top had been found considerably decomposed. This had been forked off and scattered about the barnyard. When the horses were first put on the fresh ensilage they refused it, but after a little time began to eat it quite freely.

According to the history obtained from the owner, "one mare was noticed not right at 4 P. M., Jan. 2, 1903. First symptoms noticed were slobbering; about three hours later uneasi-

ness in the stall; at 8 P. M. noticed that animal had lost power of deglutition. At the same hour noticed the animal trembling some. At 9 P. M. started to sweat, went down and unable to rise sometime between 10 and 11 P. M. When seen, paralyzed, tongue extended and the animal went from bad to worse until she died at 3 P. M., Jan. 3, 1903. This animal was seven years old and weighed 1,800 pounds. No post-mortem made."

The horse on which Dr. Annand held a post-mortem was noticed to be sick on Monday evening, January 5, and followed very much the same course as the other one except that it was not quite so aggravated, and died about 8 o'clock P. M., Jan. 7, 1903, after forty-eight hours' sickness.

Post-mortem made at 3 P. M., January 8. On cutting the animal open the first thing noticed was hydro-thorax and some fluid in the peritoneal cavity. The right lung was somewhat congested; the heart on one side seemed to be somewhat inflamed, but could not determine positively. It might have been hypostatic. The small intestines were somewhat injected and along the course of the mesenteric artery of small intestines there were bloody deposits. The liver was somewhat dark in color and quite easily torn. On opening up kidneys pustular matter was found in the pelvis. On removing the head a great amount of serum escaped and about the cord the meninges were more or less injected. On removing a portion of the spine in the sacro-lumbar region the vessels of the cord and its coverings were found much injected.

A portion of the lung, heart wall, spleen, liver, kidney and spinal cord and the whole of the brain enclosed in the skull were brought to the laboratory in a frozen condition. Specimens were examined the morning of Jan. 10, 1903. The lungs showed small collapsed areas; the heart wall showed a hæmorrhagic portion 1½ x 2 inches, very dark in color and evidently a lesion present before death. The cortex of the kidney was much congested. The meninges of the spinal cord and brain were congested but showed no pus.

Portions of tissue from each of the organs were preserved in

10 per cent. formaldehyde and in 96 per cent. alcohol. Cultures were made in broth and on serum from each of the organs, including both the meninges and white matter of the brain. After forty-eight hours in the incubator a growth was present in and on all of the cultures, excepting those from the brain substance which showed no growth on either medium.

After careful picking of colonies and sowing out on various media, the following organisms were isolated from the different sources:

Lungs.

(1) Streptococci in long chains; very numerous.

(2) Diplococci, apparently *diplococcus pneumoniæ.*

(3) *B. coli communis.*

Heart Wall. Streptococci only; long chains.

Spleen.

(1) Streptococci in long chains.

(2) Staphylococcus (albus?).

Liver. Streptococci.

Kidney. Streptococci.

Meninges of spinal cord. Streptococci, diplococci and large spore-bearing (putrefactive?) bacilli.

Meninges of brain.

(1) Streptococci and diplococci.

(2) Staphylococcus albus.

Brain substance. No growth.

At the time of Dr. Annand's visit another horse was sick. Temperature was 100.5°, respiration 22, pulse 58, mucous membrane of eyes was somewhat injected.

Jan. 28, 1903, Drs. Brimhall and Wilson visited the farm of Mr. G. P. T. again. On arrival a seven-year-old gray horse, No. 29, laboratory series, which had been sick for ten days was found down on its right side in the barn. The animal began ailing on January 11 and went down on January 18. The owner did not think until the horse went down that it was suffering from the same disease of which the others died. During this time Mr. T. had fed it gruel, milk, etc., from a bottle,

it being unable to swallow coarse food. The animal was apparently unable to make even an effort to rise, though it was able to freely move both front and hind legs. It could raise its nose but not its head. Sensation seemed to be entirely absent over the posterior extremities. Temperature of this animal was 105.2° at 8.30 A. M., January 22nd. This was the fourth animal out of five which Mr. T. had lost, the second being the one from which specimens were collected by Dr. Annand, Jan. 8, 1903.

The third was the horse noted by Dr. Annand as becoming sick on January 8, and concerning which data was to be supplied by Mr. T. The animal died January 12. Shortly after Dr. Annand's visit, two other horses were hired from a neighbor to do the work of the farm, but were kept in a shed apart from that in which Mr. T.'s horses had been sick. However, a door opened from this shed into the barn in which the sick horses had been kept.

Horse noted above was killed by bleeding, and an autopsy made at once. The throat, posterior pharynx and trachea were apparently normal. Lungs showed hypostatic congestion in the dependent portions, and a strip of consolidated tissue in the centre of the anterior lobe about three inches long and one-half inch wide on the left side. Several areas of hæmorrhage from one-fourth to one inch in diameter were found under the endocardium. The spleen was small and rather dried than normal. The liver was apparently fatty. The intestines and mesentery were apparently normal except for the presence of several aneurisms containing worms—*strongulus armatus*—in the mesenteric arteries. The kidneys were apparently normal—except for a clot—extracapsular—about the right (lower) kidney. On opening the spinal cord at the cervical region a large amount of reddish colored serum escaped. The meninges of the brain and cord were congested, but showed no pus. Congestion was most intense about the pons and base of the cerebrum. In the lumbar region of the cord small flakes of yellowish exudate (*fibrin*) were found attached to the pia of the cord.

Direct coverslip preparations, cultures and tissues for histo-

logical examination were collected from the trachea, lung, heart, spleen, liver, right hock and meninges of brain and spinal cord in the cervical and lumbar regions.

Direct coverslip preparations stained with eosin and methylene blue on examination showed bacteria, as follows :

Lung. Diplococci.

Heart's blood. Negative.

Spleen. Negative.

Liver. Negative.

Right hock. Negative.

Meninges of brain. Diplococci, (lanceolate, encapsulated, Gram-staining, some intracellular and some extracellular).

Cervical spinal cord. Ditto.

Lumbar spinal cord. Ditto.

Cultures in broth and on serum after incubation showed bacteria as follows :

Trachea. Numerous large and small bacilli ; staphylococci. (No diplococci.)

Lung. Diplococci.

Heart's blood. Negative.

Spleen. A few streptococci.

Liver. Negative.

Right hock. Negative.

Meninges of brain. Diplococci (lanceolate Gram-staining).

Meninges of cervical spinal cord. Diplococci (lanceolate Gram-staining).

Meninges of lumbar spinal cord. Diplococci (lanceolate Gram-staining).

The diplococci isolated from the meninges of brain and spinal cord and from the lung gave a turbid growth in broth and after twenty-four hours a slight precipitate. On agar, white isolated colonies about 0.5 mm. in diameter.

In and on litmus lactose and litmus dextrose agar colonies developed similar to those on plain agar. The acid reaction on these media was variable within narrow limits, but there was no formation of gas bubbles.

On serum the colonies were somewhat larger in diameter than on agar, pasty in appearance and of the color of the serum.

No visible change was produced in milk after eight days' growth in the incubator.

In gelatin stab cultures only a very faint growth took place along the needle track after eight days.

Rabbit 671 was inoculated intravenously with 0.3 c.c. of a broth culture, fifth generation of the diplococcus from this horse. Animal died after four days.

At autopsy many diplococci were found in the exudate from the meninges both within and outside of the leucocytes. One small focus of pus was present in the right lung. No other gross lesions were discoverable.

Rabbit No. 685 was inoculated February 28, in left subdural space with 0.2 c.c. with emulsion of the serum culture from this case. The animal began to exhibit symptoms of meningitis on second day after inoculation and died seven days later. Marked meningitis was present at autopsy and *diplococcus pneumoniæ* was recovered from the meninges.

There can be no doubt that these cases were *meningitis*, due to *diplococcus pneumoniæ*. The same train of symptoms has however been reported by Pearson * as being reproduced by him in horses by feeding with ensilage. Therefore in order to determine whether the ensilage had anything to do with the direct production of the disease or with transmitting the organism to horses, the following experiments were conducted :

January 5 Mr. T. shipped to the laboratory in twenty-four sacks over one ton of the ensilage. Six of these sacks were filled with the half decomposed material described above, and the remaining eighteen sacks with good ensilage. The weather was cold at the time and the sacks were placed outdoors, where they remained frozen for some time. They then thawed out and began to decompose and mould.

(*To be concluded.*)

* Pearson. *Journal of Comparative Medicine and Veterinary Archives*, 1900, volume XXI., page 654.

A TEST OF THE IMMUNITY OF TREATED CATTLE AGAINST A NATURAL EXPOSURE TO TUBERCULOSIS.*

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A brief sketch of an experiment which was made in connection with some other tests as to the possible immunity of cattle against a natural exposure to tuberculosis may be of interest.

A cow, No. 211, which had been tested with tuberculin without reaction in 1902, received injections into the jugular vein of 10 c.c. of a moderately virulent human tubercle culture which had been cultivated in the laboratory for 59 to 62 generations. This culture did not appear to be longer virulent for cattle, although it was still virulent for guinea-pigs. The injections were made on July 19, August 6, August 20, September 25, and October 7, 1902, 10 c.c. of culture being used each time, 50 c.c. of culture, therefore, being used altogether. The second injection on August 6 produced an accelerated respiration. Otherwise, though the animal was thin, it appeared to be in a good healthy and fairly thrifty condition. During this time it had raised a healthy calf. On January 27, 1903, it was placed in a stall with tuberculous animals together with some others for the purpose of testing its immunity. Tested with tuberculin at this time no reaction was noted. On January 30, 1903, it was tested again with tuberculin without reaction. On August 6, 1903, it was killed and post-mortem made by Dr. Schroeder. He makes the following records of this examination:

The entire lung was sprinkled with minute white nodules about 1 mm. in diameter. The appearance was similar to that commonly seen in intravenous injections of human tubercle culture into cattle. The other organs and glands did not show tuberculous lesions, and while there were some circular red

* Published by the courtesy of Dr. D. E. Salmon, Chief of Bureau.

patches in the mediastinal glands, guinea-pigs inoculated from these did not become tuberculous. Guinea-pigs inoculated from the lung of this animal died of tuberculosis, showing that there were still live tubercle bacilli in the lung tissue. The presence of these live tubercle bacilli seemed to be due, therefore, to the inoculation with the human culture and not to an infection which the animal might possibly have gotten from the diseased animals in the stalls in which it was exposed. This animal, together with four check untreated animals, and two animals treated with dead bovine and human tubercle bacilli (in an experiment of Dr. Schroeder) were all exposed to infection in the stable from tuberculous cattle as previously noted, on January 27, 1903. The autopsies of these check and other animals showed tuberculosis of a character which could have been contracted from the exposure only, as the animals in the first instance were perfectly healthy. While the animal treated with the human germ was apparently resistant to the bovine disease, at the same time the human germ which had originally been injected was still persistent in the animal's system and was probably fairly widely distributed. While, therefore, fine animals which are to be used for breeding purposes might perhaps be immunized to advantage by the method, as suggested in 1894 by one of us (de Schweinitz), the practicability of such a method as applied to animals that are to be used as food or for the purpose of producing milk is questionable, as it is impossible to say how long the injected tubercle bacilli may remain alive.

The experiment is reported as a side issue in connection with a test that is being made for another purpose as one case in the line of these general immunization experiments which both ourselves and others in other parts of the country are conducting.

THE next meeting of the New Jersey State Board of Veterinary Medical Examiners, for the examination of candidates for license to practice in New Jersey, will be held at the State House, Trenton, N. J., the early part of January.

THE "CRAB" OR "FORGER."

COMPETITION FOR THE PRIZE OF TWENTY-FIVE DOLLARS OFFERED BY DR. WM. DOUGHERTY.

THIRD PAPER.

By No. Three.*

"Forging" may be defined as an abnormal sound produced by striking the toe of the hind foot against the fore foot of the same side, and is the want of harmonious action between the anterior and posterior extremities, being either too great a rapidity of the movements of the hind limbs or an exaggerated slowness of those of the fore limbs.

Etiology.—(a) The general condition of the animal.

(b) Faulty conformation.

(c) Improper shoeing.

(a) Under the general causes may be mentioned fatigue, weakness, excessive use, improper training and some diseased state. Young horses put on the road as two and three-year-olds, mature horses which are over driven and those that are not accustomed to work at speed. The above conditions generally yield very readily to the influence of good sanitary conditions, judicious exercise, nutritious food and proper care.

(b) Under faulty conformation may be cited (1) The undesirable attitude of the horse standing under himself, which necessarily shortens the base of support, and the hind feet during locomotion have a tendency to meet the fore feet, whence results the forging. (2) The deficient length of the body relative to its height. (3) Excessive long posterior limbs compared to the length of the anterior. (4) An excessive long back and loins, which results in too great a flexibility of the spinal column, allowing the posterior extremities to reach the anterior more easily. (5) A voluminous and weighty head. (6) A short, thick and heavy muscled neck as well as the shoulders.

* The identity of the author remains the property of the Review until the judges have rendered their decision. For conditions of the contest, see October Review, page 628.

The two latter conditions surcharge the anterior limbs and determine a longer contact of the fore feet with the ground, which causes an appreciable tardiness in raising the fore feet. As a result of this delay, if the gait be lengthened the posterior feet not finding the place free which they should occupy strike against their corresponding homologues. Hence the particular sound which announces that the horse forges.

(c) Under improper shoeing I will name unlevel feet, ill-proportioned length of feet, heavy shoes (the animal being accustomed to light ones), extended toe of hind shoes, branches of fore shoes too long, heavy toe-calk on fore shoes (the animal being accustomed to rolling motion).

As to the question of soundness, I consider forging the natural consequence of the causes enumerated above, and that it does not constitute an unsoundness. If it is due to an anatomical or functional lesion, would not this be the unsoundness and the forging the resulting symptom?

* * *

FOURTH PAPER.

By No. Four.

Having to consider this subject from two standpoints only, viz., is the horse sound? and location of the anatomical lesion, it seems to me that the following would answer the foregoing subject, briefly and truly:

If I were to define forging, I would say it was a sound produced by the toe of the hind foot hitting the bottom of the shoe on the forward foot while the animal was in motion, caused by faulty conformation of the body in general.

The forging horse is sound by all means, for no pathological lesions as a rule exist. It is a fault of conformation, not confined to limb or foot, but to the body in general.

If we look at the conformation of such a horse ("forger") we will generally find a short-bodied, rather leggy animal, with a slow and rather uncontrollable movement, and the sound made by forging is produced by the toe of the hind feet coming

in contact with the bottom of the shoe on the forward feet, especially noticed when the animal is hurried.

I would consider a forger sound, unless he was a dummy, as is sometimes the case, or had other malformations which we consider an unsoundness. Forging does not interfere with the health or usefulness of such an animal, and he is in possession, generally, of as much perfection as is consistent with his conformation.

I consider that the anatomical lesion, if such it be, is a faulty conformation.

* * *

FIFTH PAPER.

By No. Five.

Forging is the result of any cause that prevents a horse from getting his fore feet out of the way of his hind ones in progression.

There are predisposing and exciting causes. Of the former, undue shortness of body is a frequent one.

Any cause, that interferes with the harmony of action between the fore and hind extremities, is more apt to cause "overreaching" in a short bodied horse than in one of desirable length.

Horses with the fore pasterns disproportionately long, when compared to the hind ones, especially if the fore feet are also inclined to unusual length, experience retardation in the flexion and extension of the fore legs to a degree that renders interference from the hind ones liable.

An important factor in good action is the straight advancing of the fore legs in progression. Any deviation from this, as in "winding-out" or "winding-in," or a combination of these two defects, sometimes called "wiggling," retards sufficiently prompt action of the fore legs to enable the feet to make way for the hind ones, at times.

These defects of action are the result of the bones that make up the foundation of the legs, being defectively related to one another in forming the joints. There are very palpable illus-

trations of these defects of formation in horses with knock-knees, calf-knees, "turned-in" or "turned-out" pasterns.

We notice in individuals a lack of harmony in formation between the fore and hind extremities. For instance, some horses have the pasterns of the hind extremities of a length altogether disproportionate to those of the fore, and *vice versa*. So with action, some have quick and extensive flexion of the hocks, out of proportion to the degree of promptness of the flexion and extension of the fore limbs. Such horses are very liable to forge.

Those of a phlegmatic temperament, particularly if they are low-headed, as they not only lack "snap" in their action, but the lowness of the head interferes with the freedom of the forward action.

The exciting causes may be summed up as those that overtax a horse's strength, as too heavy shoes in front, carrying too heavy a weight or drawing too heavy a load, particularly if pace is fast, and going heavy, also allowing the fore hoofs to grow too long. Lack of strength, as in undeveloped horses, in underfed or overworked ones, and also from fatigue. Horses with unresponsive mouths that bore on the bit.

Some horses, when uncollected, will forge that if stirred up with spur or whip will get their heads up and noses in and show no sign of it.

Forging is not an unsoundness. There is no lesion. It is a defect or fault, as bad carriage and defective action are.

* * *

[ERRATUM.—In the "Second Paper" of this contest, December REVIEW, page 841, line 7 of "Second Paper" for "Teuch" read "Peuch."—EDITOR.]

MORE than eighty horse shows were held in the United States in 1903, according to the "American Horse Show Blue Book" for the current year. The records disclose an increase of more than fifty per cent. in the number of exhibitions since 1902, only fifty-two having been listed in the Blue Book last year.

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

CHRONIC HYPERTROPHIC SIMPLE PERITONITIS IN A COW.

By JOHN J. REPP, V. M. D., University of Pennsylvania, Philadelphia, Pa.

Some time since there was sent to me by Dr. G. A. Johnson, Inspector Bureau of Animal Industry, Sioux City, Iowa, a piece of the abdominal wall of a cow which had been slaughtered under his supervision in an abattoir. The piece which he sent was about a half square foot in size and included the muscular coats and the peritoneal lining. The muscles did not present anything abnormal, but the peritoneum was thickly studded by new growths varying in length from an eighth of an inch to an inch and a half. The largest ones were a half square inch on cross section at the thickest part. Some of them were attached by a narrow pedicle. The whole mass presented a cauliflower-like appearance. Upon close examination tuberculosis and parasitism were definitely excluded. As the new growths were dis-

tinctly fibrous in character the case was considered to be a simple peritonitis of hypertrophic character. There was no exudate and there was not the least sign of necrosis in the vegetation.

A photograph of a portion of the specimen, 5 in. x 8 in. in size, is here reproduced.

Such extensive vegetations never occur in man in this form of peritonitis and I believe they are rare in the domestic animals. It is the first case I have observed in which the vegetations were so marked, and Kitt in describing this disease in his "Pathologische Anatomie der Hausthiere," does not describe any such enormous outgrowths as are present in this case. Of course, in tubercular peritonitis the outgrowths may reach a much larger size.

TWO CASES OF AZOTURIA OCCURRING UNDER PECULIAR CIRCUMSTANCES.

By E. B. ACKERMAN, D. V. S., Brooklyn, N. Y.

I am afraid, in reporting the two following cases, that I will be credited with exaggerating the truth, and I could hardly blame my colleagues for doubting the facts. But as the pathology laid down by our text books hits so far from the mark, in cases of azoturia, we seem to be so far astray as to the true cause of it, that I feel justified in publishing these two cases.

The first case was a large draft horse, laid up for the purpose of a mallein test. On Thursday and Friday gave a strong reaction; maximum temperature 106° F., with large œdema at point of inoculation, which did not subside for several days. At the end of three weeks the horse was again laid up (he having been to work in the meantime), for the purpose of giving a dose of physic previous to a retest. He was prepared for physic ball on Wednesday, medicine administered on Thursday morning; on Friday he purged all day plentifully, the discharge being almost watery. On Friday night, about 10 o'clock, horse was taken with azoturia in stable, first in one leg, and inside of an hour in the other, when he went down. Urine very highly colored, viscid, and the characteristic odor of old urine. He had all the other symptoms of azoturia.

The other case was still more strange. This was also a large draft horse, about fourteen years old. Two years ago during the influenza epizoötic he had purpura hæmorrhagica. This fall he was again attacked by the same complaint; the owner remembering his former experience undertook to treat him himself, and treated and nursed him for about one week; when, not do-

ing any better, I was called in. Found him with all legs swollen, head and nose swollen, dyspnœa, petechiæ and blood in both nostrils; *not eating*, and this was what worried his owner most, as the swellings were not so bad as they were in first attack. Had horse under my treatment for two days, using my usually successful form of treatment for this complaint, combined with the new treatment ("Tallianine") for the increase of leucocytes (improved blood), when the horse suddenly showed uneasiness of one hind foot, broke into a profuse perspiration, began to knuckle and finally went down; was able to get up with help for 24 hours; urine characteristic color and consistency; then was unable to get up at all, and owner asked to have him destroyed.

The striking thing in this case was the appearance of two diseases diametrically opposed. Purpura hæmorrhagica is always a disease of debility; azoturia of plethora and overfeeding. In the first case, azoturia appeared after a good purge, while in stable without exercise.

WHOLESALE POISONING OF CATTLE—WHAT WAS THE CAUSE?

By Dr. Dickinson Gorsuch, Glencoe, Md.

On Sept. 6th, shortly after my return from the meeting at Ottawa, I was awakened early in the morning by a messenger from Mr. E. M. Gillet, proprietor of "Bacon Hall Stock Farm" and breeder of pure-bred Hereford cattle; the messenger said that eight of the cattle were sick and for me to get there as soon as I could. My first thought was, "What can be the trouble that so many cows are sick at one time?" Last summer Mr. Gillet bought between seven and eight tons of sugar cakes for food for his cattle; the cakes were made by a well-known firm, but the lard used in their manufacture was found to be rancid, and so they were sold at a very low figure. Mr. Gillet put the cakes on the barn floor and had fed them to the cattle right along; the cattle liked them and seemed to do well upon them. On the night of Sept. 4th the barn door was accidentally left open, the cattle got in and gorged themselves with the cakes. On Sept. 5th Mr. Gillet noticed that some of the cattle did not seem well, but did not take much notice of them. On the morning of the 6th I found the eight cattle scattered over a large field; all were down; some were sitting up; others were stretched out on their sides; they were groaning as if in a great deal of pain; they had all purged considerably and just before death would vomit a thin yellowish fluid. One cow died a few min-

utes after my arrival, and another one died before I left. I prescribed stimulants and anodynes, gave what medicine I had with me and sent a man for more medicine. I went to see the cattle again about four o'clock P. M.; the man had been delayed in getting the medicine and hadn't returned. Two or three more had died; one had been taken sick since the morning. Mr. Gillet happened to remember that two more cows were missing, so we started to hunt for them; we found them in a little strip of woods along the upper edge of the field; one was sitting up with her head wedged in between some bushes; she was dead; the other one was near her and nearly dead; she died a short time after. One two-year-old heifer, which I thought nearly dead, recovered; she aborted the next day. I held a post-mortem on one cow, but did not find anything in particular. I found the rumen very full of food, which looked natural; the small intestines were empty. Eleven of the cows were sick—eight died.

My theory was that death was caused by ptomaine poisoning. I brought some of the cakes home, intending to have them analyzed, but neglected to do so, and still have them here. I should like to have the opinion of other veterinarians as to the cause of death of the animals, and also if there is a case on record similar to this one.

MAL-POSITION OF PENIS IN A CRYPTORCHID.

By Drs. White and Plaskett, Nashville, Tenn.

The accompanying photograph shows a rather unusual position of the penis. The horse is a well-developed four-year-old cryptorchid, in good health and anatomically perfect in every other particular.

The penis is fairly well developed, and when erected and protruded measures eight inches. The slightest manipulation causes its erection. Urine is passed without difficulty from a normal urethra.

A careful examination of the inguinal region fails to reveal the presence of either testicle; so we are warranted in concluding that they are in the abdominal cavity.

EXTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

PUNCTURE OF THE COLON PER RECTUM—ESERINE [*C. Cunningham*].—Under this heading the author relates a case of colic with severe continuous pains, pawing and scraping, wandering about his box, backing against the wall and into corners, sitting on his haunches, with a pulse of 80 and upwards, pupils dilated, eyes glaring, but with no outward tympanites worth mentioning, and which, during sixty hours resisted the usual laxatives and stimulants, sedatives and anodynes, clysters, fomentations, long-tube enemas, 2 grs. of sulph. of eserine in the jugular and 1 later under the skin, etc., when the thought came to him that he carried with him an 18-inch slender trocar and canula. He introduced it into the rectum, and through its coats punctured the dilated portion of the colon on the right portion, which had displaced the rectum. The gas was allowed to escape, and instantaneously the horse was relieved. The animal had a good passage shortly afterwards and moderate purgation the next day. In a day or two he was able to resume light work. The author suggests that this simple operation might be resorted to oftener; that it is as justifiable as that of the cæcum at the flank; that he had not had any bad results from it; that in cases where there is no externally apparent tympanites the condition and bulging of the colon can be readily felt through the rectum, and that by the operation many horses might be saved. In relation to eserine the author has been disappointed in somewhat similar cases; but in one other, however, where puncture per rectum was not indicated, 1½ grs. of eserine in the jugular gave him excellent results.—(*Vet. Record, Aug. 8, 1903.*)

FRACTURE OF THE PELVIS [*A. J. Williams*].—This case refers to a rather complicated fracture, which, treated for a long time, made sufficient recovery to allow some amount of work, but at post-mortem showed extensive lesions and partial incomplete union. The horse, while being put to harness, reared, fell backwards, and after getting up was lame. The right hip was much swollen, hot and painful; fracture was detected on rectal examination. The horse was put in slings and stayed in them for three months, when he was allowed walking exercise only

for two months longer, and then sent to light work. This he was able to do for about five months, showing only slight lameness, not more than one would expect as the result of shortening and the general deformity which was present. His duty consisted in carrying a man about 300 miles. Once or twice he showed an increase in the lameness, after a little harder day of work, but a few days of rest brought him back all right again. At last the lameness became so marked that he had to be laid up. On examination per rectum fracture of the shaft of the right ilium was detected immediately anterior to the acetabulum, an enormous callus, and a large spicula of bone projecting were also detected in the pelvic cavity. These conditions were confirmed at the post-mortem ; the shaft of the ilium was fractured ; there was one also through the wing of the same bone, midway between the external and internal angles ; the pubic symphysis was apart. There was also a large thick callus with long spiculæ, one of them projecting into the pelvic cavity.—(*Vet. Record, Sept. 12, 1903.*)

Ectopia Cardis [*E. Morgan, M. R. C. V. S.*].—The animal was a full-time calf, which was able to suck, and was to all appearances fairly healthy, with the exception that his respiration was somewhat hurried, and when he was made to move quickly for a few yards had a rather distressing cough. The heart was situated at the postero-inferior portion of the neck, a little to the left side and quite anterior to the chest. Pulsation could be seen distinctly at ten yards distance and the shape of the heart could be felt by the hand. The beats, which were really a prolonged thrill and quite different from that of the pulse of a heart in normal position, were in average 120 per minute. When about three weeks old another enlargement could be seen posterior to the heart and to the right side. The calf was killed when seven weeks old. On cutting through the skin and subcutaneous tissues, the pericardium was exposed and in it the heart, well developed and healthy, as well as the blood vessels attached to it. To the right there was a swelling which contained about a pint and a half of pus. The cavity of the chest seemed to have its full capacity, but was almost empty, as the lungs were ill developed, each being only about half the size of one's hand. The opening between the first ribs was sufficiently large to allow the heart to pass to and fro. The calf came from a cow which in less than eight years had nine calves, of which six were bulls, and during that time had yielded 11,300 gallons of milk.—(*Vet. Record, Sept. 26, 1903.*)

DIAPHRAGMATIC HERNIA VIA FORAMEN SINISTRUM [*H. Begg, M. R. C. V. S.*].—About one hour after returning from her work, an aged mare, hardy worker and in good condition, was taken with the symptoms of flatulent colic, for which a dose of aloes and oil were prescribed, with a few doses to be administered to relieve the flatulency. The case seemed simple enough except that the mare had a most haggard expression, and when she was down she groaned and tried to roll on her back. As there was no change after a few hours and her temperature was rising, she received a full dose of salicylate of eserine; enemas were prescribed, and also mustard on the abdomen. She was reported as having been quiet during the night, but her pulse was found almost imperceptible and her temperature up to 104°. On auscultating the chest, a marked dullness was apparent in the lower half, particularly on the left side, and synchronous with the heart's action a sound of water being displaced was just audible. Later in the day the haggard expression was more marked; the fluid sounds accompanying the cardiac contractions were now well marked, and could be heard when standing at the head of the animal. The action of the heart was regular, quick, and weak, and the cavernous, tinkling watery sounds, occurred in perfect rhythm with the heart's action. These sounds were identical to those heard in traumatic pericarditis. The mare grew worse and finally died. At the post-mortem a loop of intestines, two yards long, was found lying between the lungs. It was highly congested and had made its way through the foramen sinistrum, which, though larger than usual, was intact. The author in putting the question, When did the hernia occur? thinks that it is quite possible that a small hernia had been present before the mare was taken ill, as long as the prolapse existed through a natural opening, and that it would not be improper to suppose that it had been increased through the struggles of an animal suffering from flatulent indigestion.—(*Vet. Record, Oct. 17, 1903.*)

ON THE PATHOLOGY OF INTUSSUSCEPTIONS [*E. M. Corner*].—In two very interesting articles, the author, after taking into consideration and criticising the ideas generally admitted on the pathology of these intestinal lesions in man and in animals, and having briefly presented the cases which have been recorded in veterinary literature, resumes the series of all the observations as follows: "According to the investigation of the cases found in veterinary works, there are 42 recorded, viz., 3 in ruminants, 13 in horses, 25 in dogs and cats, 1 in a monkey. Of

these cases, there were 4 which were evidently double intussusceptions, 10 or 12 which might have been considered as such. Nine invaginations occurred on the small intestines only; they were enteric. Twelve were ileo-colic; that is, invagination of the small intestine through the ileo-cæcal valve. Eight were colic and occurred on the large intestine only. There were none at the ileo-cæcal valve—a point of importance, as pathologists agree in attributing the origin of the intussusception to the valve. In dogs and cats, invaginations seem specially to occur on the small intestine. In horses also, when they are young, but when they are advanced in age it is in the cæcum. —(*Journ. of Comp. Pathol. and Therap., Sept., 1903.*)

CARCINOMAS OF RUMINANTS [*A. M. Tutter, M. R. C. V. S.*] —For many pathologists, carcinomas are rather rare in animals of the bovine species, but for the author it is an error, and he believes they are met oftener than it is generally admitted, and he gives a concise record of several cases where he has found this form of neoplasm: (1) A *squamous-cell carcinoma* of the orbit of a cow, in which the tissues of the ocular globe, muscles and the lachrymal gland had remained intact, while the eyelids near the nasal canthus of the left eye had been destroyed and replaced by a fungoid growth round and irregular, whose nature was confirmed by microscopical examination. (2) A *squamous-cell carcinoma* of the rumen of a cow, occupying the anterior pillar of the rumen. (3) *Another of the same nature* and in a similar situation under the aspect of a cancerous tumor, measuring 29 x 18 centim. It had the appearance of an enormous cauliflower. (4) *Another squamous-cell carcinoma* of the rumen, again in the same situation, and formed an irregularly circular tumor, fungoid and ulcerated, and measuring about 23 centim. in diameter. (5) *Squamous-cell carcinoma* of the lung of a cow, situated in the lower half of the left lung, where it had the shape of a lobulated tumor, in which the lobules had a consistency varying between pus and cartilage, with a coloration between a creamy white and a greenish yellow, and with dimensions varying between that of a seed of millet and a man's fist. (6) *Spheroidal-cell carcinoma* of a cow. At the post-mortem a large number of nodules were found on the peritoneum, the mesentery, the surface of both lungs, in the walls of the heart and in several of the abdominal muscles. These nodules varied in size and looked like artichoke. Their surface was irregular and papillated. Their consistency, although not always the same, was generally soft. The white-greyish color predomi-

nated in them, with intersections of reddish and yellowish streaks. In all the cases the diagnosis was confirmed by microscopic examination.—(*Journ. of Comp. Pathol. and Therap., Sept., 1903.*)

Mammary Tumor in a Sow [*A. G. Hopkins, D. V. M.*].—Towards weaning time, a thorough-bred Yorkshire, instead of having the mammæ reducing, they were enlarging towards the posterior part. A mild irritating application reduced the swelling, but did not remove it entirely; there remained a lump as big and as hard as a base-ball. At the time of the next parturition this became larger, much so, and remained until weaning epoch, but although it reduced some, it still was larger than in the first attack. Towards a third parturition the growth had reached such dimensions that it dragged on the ground, and its lower surface was all ulcerated by rubbing against it. As her litter had all died, it was decided to operate on her. The skin was dissected from its base and the tumor removed with the ecraseur. It was formed of hard tissue containing numerous pouches filled with pus of bad odor. It had but one main blood-vessel and weighed about 30 pounds. After a few weeks, as there were indications of a relapse, the sow was killed. The author has already met with one case similar. The animal was operated, but died from shock within a few hours after the operation.—(*Journ. of Comp. Pathol. and Ther., Sept., 1903.*)

BELGIAN REVIEW.

By Prof. A. Liautard, M. D., V. M.

The New Compounds of Silver Used in Medicine [*Prof. Dupuis and Vanden Eeckhout*].—For a long time back nitrate of silver has been the only compound of this metal used in medicine. It was only after Miguel had found that it had eminently marked antiseptic properties that it became used in some diseases where infection played the principal part. But the objections due to its caustic action incited the researches of several scientists, and other compounds became known and tried. Among those first came *Collargol*, weak bactericide, which is indicated in all the infectious diseases of man and animals. In Germany it has been used in purpura, typhus, diarrhœa of calves, broncho-pneumonia, distemper, suppurations, furuncles, etc. *Protargol* is a compound of silver with a pro-

teic substance. It has a stronger bactericide action than nitrate of silver. As it is not caustic, it can be applied on mucous membranes. In veterinary medicine, it has given excellent results in the treatment of articular wounds, fistulæ of quittor, canker of the foot, all the diseases of the foot. Hermans has had good effects in infectious mammitis, in conjunctivitis, in microbian affections of the uterus and of the bladder. It is used in solution, 1:10. *Argonine* is a caseinate of silver. It is a very powerful bactericide, but not caustic nor irritating, even in concentrated solution. In veterinary medicine it can be used upon ulcerated surfaces, in abscesses and upon wounds of bad nature. A solution of 1 to 2 per cent. is generally used. *Ichtargan*, or thiohydrocarburo-sulphate of silver, possesses a most powerful bactericide action. Affections of the uterus in mares and diarrhœa of sucking colts and also arthritis of young animals have been treated by its use in solution of ½:1000—the solution of 1:1000 is slightly caustic for the uterine mucous membrane. *Argentamine* is a solution of phosphate or nitrate of silver in ethylenediamine. It is used in solution of 3–5 per cent., and can be employed in the treatment of wounds and solutions of continuity.—(*Ann. de Bruxelles, Sept., 1903.*)

Curious Case of Cryptorchidy in a Horse—Operation—Recovery [*Prof. T. Hendrickx*].—It is no doubt an interesting and curious case, and the history of this horse, which has been operated upon four times, the inguinal canal having been perforated four times and has had an eventration following one of those operations, is here given. The first time the operator was called to relieve a left cryptorchidy, but vainly felt for the testicle and gave it up after closing the scrotum with a suture. The next day there came the eventration, which was fortunately reduced, and with a suture high up on the scrotum was followed by recovery. Having been disposed of by the owner, the horse was after awhile reëxamined by another veterinarian, operated by him, but no testicle could be found. After recovery the horse again changed hands, when finally the author was called to examine him and to operate. This, however, proved a very difficult task, the inguinal canal having by the previous operations undergone alterations of a plastic nature. The difficulties, however, were overcome, and finally the cavity of the peritoneum was entered as near the external angle of the ilium as possible. But no testicle was found. Passing the hand on the bladder so as to find the efferent canal, the last being detected and traced, the spermatic cord was readily found, but tractions upon it failed to

bring the testicle outwards. Adding to the inguinal examination rectal exploration, the organ was finally detected, half way between the umbilical region and the anterior border of the penis, where it formed a rounded mass as big as two fists, and was adherent to the parietal wall of the peritoneum. To break up the adhesions was no little undertaking, and notwithstanding the manipulations of the left hand, whose index finger was lacerating them, those of the right hand in the rectum trying to dislodge it, and the tractions upon the cord made by a strong cord secured on it and pulled upon by an assistant, the author after an hour of hard work was physically and morally unable to proceed further. The wound was closed with suture well up on the scrotum. This third operation was again followed by easy and rapid recovery. In three weeks he was entirely well. Seven months later the animal was brought back to Prof. Hendrickx to be operated, either by the flank or by the inguinal tract. This last was decided as the best plan, and, notwithstanding the greatest difficulties, the testicle was finally let loose from its attachments to the peritoneum, brought into the inguinal canal and removed by the ordinary way with the ecraseur. There again the recovery was short and radical in three weeks. The testicle showed its external surface covered with irregular broken small bands, remains of the adhesions which had been torn and which evidently were due to an attack of localized peritonitis which had followed the first manipulations during the first attempt at castration. The testicle was three times the size of a normal organ.—(*Annal. de Med. Vet., Sept. and Oct., 1903.*)

Osteo-Sarcoma of the Cranial Arch in a Dog [*G. Hebrant*].—A strong four-year-old mastiff dog had for six months presented a peculiar abnormal aspect. His work, rather hard, lasting several hours a day, consisted in helping to pull a cart, and to start it it has been his habit, while pulling in the collar, to check his head up and down more or less, according to the difficulty in going ahead, and in so doing he knocked his head more or less severely against the floor of the cart. It was under the influence of the repeated contusions that the tumor which he had on his head was developed. This tumor was round, circumscribed by an irregular circular line which from the base of the nose reached the occiput in passing along the orbital arches and the base of the ears. This peculiar cranial cap had the size of a round loaf of bread. Its external face, entirely formed by the skin, which was not adherent to the tissues

underneath, presented about the middle of the forehead, an elevated part slightly conical. The consistency of the growth was that of fibrous tissue, homogeneous except in two places, where some fluctuation was detected. It was painless and firm, pressure upon it did not give rise to any cerebral manifestation. Notwithstanding this voluminous growth, his general condition was good, intellect preserved, the animal gay, hears well, sees well, but is obliged to carry his head well up to see. A diagnosis of osteo-sarcoma was made, and as no surgical treatment of any kind was likely to benefit him, he was left under observation. By degrees the tumor kept on spreading, the nose and eyes became involved, the general nutrition failed, and death took place in about two months and a half. At the post-mortem the diagnosis was fully confirmed by the appearance of the structure, and also by microscopic examination. The tumor cut vertically in its middle appeared formed of whitish tissue, fibrous, with here and there small crepitating nodules. In its greatest thickness, it measured near 20 centimetres. It was adherent to the nasal bones and invaded the frontal, parietal, temporal and occipital. It had spread inside of the cranium and reduced its dimensions, the brain showing on its surface depressions produced by the neoplasm. The lung presented in its structure nodules of various size and of aspect similar to that of the growth.—(*Annales de Méd. Vét., Sept., Oct., 1903.*)

Congenital Absence of the Large Intestine in a Dog [*Mr. Heger*].—In making the autopsy of a slut which had served practical exercises in physiology, the following condition was observed: The digestive canal was astonishingly reduced; the stomach small, the great curvature not indicated, the large *cul de sac* indicated only by a tuberosity of about two centimetres; in following the small intestine, the appendix was soon reached; this was rudimentary, and at that point there was nothing indicating the presence of a cæcal dilatation nor of the two colons; the small intestine ends at the rectum. The slut during life seemed to be in perfect health, weighing 3 kil. 500 grams. The post-mortem showed the absence of all marks of old peritonitis and the integrity of the genital organs, liver, spleen and other viscera. The following mensurations were taken: From the cardia to the pylorus, following the axis of the stomach, 11 centimetres; from the pylorus to the appendix, 66 centimetres; from the appendix to the anus, 10½ centimetres. The abdominal portion of the digestive canal was then only 11 centimetres longer than the body, which measured 76 centime-

tres from the tip of the nose to the anus.—(*Annales de Bruxelles, Sept., Oct., 1903.*)

GERMAN REVIEW.

By ADOLPH EICHHORN, D. V. S., Bureau of Animal Industry, Cudahy, Wis.

TWO CASES OF PRIMARY CARCINOMA ON THE EXTERNAL GENITAL ORGANS IN HORSES [*Dr. Hening, Berlin*].—To the few cases of primary carcinoma of the external genital organs in horses which are recorded in veterinary literature, the author adds two cases, which occurred in the polyclinic of the Veterinary High School in Berlin: (1) In a 15-year-old mare, a round, hard tumor of the size of a goose-egg, grayish-black in color, protruded from the inferior commissure of the vulva; its surface was ulcerated, gaped, and covered with cauliflower-like granulations. Each of these granulations, separated by furrows the size of which varied from a lentil-seed to a hazel-nut, set in the shape of stalks on the base of the tumor. The tumor laid on the swollen grayish-black clitoris, which easily bled, and was covered with nodules, from the size of a lentil-seed to a pea. The yellow serous offensive discharge, which formed on the surface of the tumor, was collected in a cavity about the size of a walnut, in the lower third of the tumor, before it escaped in drops from this cavity. The clinical diagnosis was "carcinoma of the clitoris," and the result of the microscopical examination of the successfully extirpated tumor left no doubt that the tumor was a primary pavement epithelial carcinoma, taking its origin from the epithelium of the mucous membrane of the glans clitoris. (2) In a mare, also 15 years old, in fair condition, a grayish-red tumor of the size of a walnut showed itself on the right lip of the vulva, about 1 c.m. from the ventral commissure. Its surface was gaped and covered with deep furrowed cauliflower-like granulations. On palpation at intervals of 2-3 c.m. above the large tumor, four smaller knotty thickenings of the size of a pea were noticeable, situated on the edge of the vulva. Other changes were not observed. In this case also, the tumors were removed by operation. The microscopical examination of the tumor corresponded with the diagnosis, proving a primary stratified epithelial carcinoma of the vulva, which originated from the epidermis of the outer skin.—(*Arch. f. Wiss. and prakt. Thierh.*)

THE AGGLUTINATION AS A DIAGNOSTIC AID FOR GLANDERS [*Pokschischensky*].—In earlier times the diagnosis of glanders in certain forms was frequently very difficult, and the value in this consideration by the mallein test is becoming less reliable, as is generally accepted. P. has been prompted by others to undertake a series of experiments to decide to what extent it is advisable to depend on the sero-diagnosis of glanders. For this purpose he has experimented with the blood serum of sixteen healthy, and eight glandered horses, two of the latter receiving mallein injections. Concerning the healthy horses, P. proved that the agglutination did not take place with the serum solution in the proportion of 1:300; on the contrary, the blood serum of the glandered horses caused a very distinct agglutination, as was found microscopically, even when the dilution was increased to 1:1000. Macroscopically, the agglutination was easily recognized when the dilution exceeded 1:500. On the other hand, the experiments concerning the agglutinizing power of the blood serum in the two glandered horses which were subjected to the influence of mallein, the blood serum when taken from the animals, when the reaction reached its height, showed that under the influence of the mallein injection the agglutinizing power of the blood serum was doubled; that even by a dilution of 2:1000, and sometimes even 3:1000, retained its agglutinization properties. This fact seems perfectly substantiated, that the agglutination is considered a defensive agent of the organism. It seems also from the foregoing experiments of P. that the introduction of mallein into the animal economy is apt to increase the quantity of agglutine, even in the absence of a thermic reaction.

ENZOÖTIC APPEARANCE OF SKIN GANGRENE IN HORSES CURED BY TINCTURE OF IODINE [*Prof. Fröhner, Berlin*].—In a large stable in Berlin, in the summer of 1899, numerous cases of skin gangrene were observed on entirely distinct parts of the body. These gangrenous spots were situated where the harness fitted closely. This enzoötic form of skin gangrene was probably caused by pressure of the harness, which by friction caused a superficial injury to the skin, and by the presence of the infectious agent in the stable. The character of the skin lesions proved very malignant, in which the necrosis advanced very rapidly, deeply, and extended to the sides. They resisted stubbornly the usual medication, and, contrary to this, tincture of iodine in combination with a sharp curette proved itself a sovereign remedy.—(*Monatsche. f. Thierheilk.*)

A Case of Colic Lasting 30 Days [*Dr. Felder*].—A horse, 12 years of age, accidentally fell into a ditch. A short time afterwards severe colicky pains developed. On account of the absence of a veterinarian, a farrier was called in, who pursued a course of treatment for colic, as he thought due to constipation. Some days after Dr. F. was consulted, to whom the owner imparted the information that the animal for seven days past showed symptoms of colic, and had no movements of the bowels. The examination per rectum showed this empty. Internal peristalsis was feeble, but there was slight meteorism. After two days of energetic treatment, the patient passed fæces regularly, and it was thought the colic was cured. But after two more days the colicky pains reappeared, and defecation ceased completely. During the next eight days rectal injections were administered; the expelled water contained very little food mixed with it. At one time three small, smooth surfaced stones were passed. By exploration per rectum there was felt in the region of the left flank, at the bend of the floating colon, a distended body, as if filled with food. The solidity of the object was not determined. For four weeks the intermittent pain continued, until the horse became severely attacked with colic, and intensely turgid, that enterocentesis had to be performed, which indeed gave little relief. The animal died shortly afterward. On post-mortem, rupture of the stomach proved to be the cause of death. In the colon, anterior to the origin of the rectum, there was found a large oval intestinal calculus, completely occupying the lumen of the intestine. Its length in diameter was 25 cm., 14 cm. respectively and its weight 2¼ klg. Perhaps the accident to the animal by falling into the ditch, had caused the stone to be dislodged from its original position, and with the ingesta carried to the above mentioned place. As the owner relates, the horse had not suffered from colic for eight years previous.—(*Thier. Centralblatt.*)

Corrosive Sublimate Poisoning in a Horse [*Dr. Kronacher*].—An owner had a horse suffering with an infected wound of the foot, for which he was advised to use corrosive sublimate tablets in solution as an antiseptic and footbath. In spite of the warning and the caution to be used in their application, he allowed them to remain on the window-sill of the stable. A few days after, the horse got loose from its halter, and ate the box containing the tablets. The result was slight colicky pains, complete loss of appetite, on the first day; 20 grammes of iodide of potassium, 150 grammes of flower of sulphur in milk, was ad-

ministered ; also a large cupful of white of egg ; and in the meantime large quantities of milk were given. On the second day, diarrhœa appeared, with a thin pulpy to an almost fluid excrement, of grayish-green, to blackish-gray color. From the fourth to fifth day, the fæces gradually regained its normal color, and on the eighth day the animal became completely well.—(*Berl. Thierarzt. Woch.*)

Removal of a Cane From the Stomach of an Ox [*Dr. Plosz, Budapest*].—In an acute case of meteorism in a sick ox, after repeatedly puncturing of the rumen, the animal did not regain his health, to the dissatisfaction of the owner. The latter called in a quack, who used a cane as a probang, and pushed it down as far as he could. The cane was swallowed by the animal. When the ox was received at the clinic, a painful swelling was noticeable on the left side, near the punctured wound ; the swelling was of the size of the palm of a hand, which, when pressed, a stinking gas escaped from the wound. For the purpose of removing the cane, after thoroughly cleaning the field of operation, on the left flank, a 10 c.m. long incision was made through the wound, after which two sacs, containing necrotic tissue and pus, were noticed. The opening of the abdominal cavity had to be postponed for six days, to prevent an infection of the peritoneum. After six days, the walls of the subcutaneous cavities were already filled with uniform granulations, and the laparotomy was performed. It was observed that the rumen adhered to the abdominal wall in a circular extension, and inside of the place of the adhesions a large cavity was present, containing about 3 litres of liquid and about 1½ kg. of tough fibrin. After the removal of this mass, an 8 c.m. long incision was made in the wall of the rumen, the hand introduced and the cane removed. The edges of the opening in the rumen were united by Lembert's method, and on the wound of the skin carbolic dressings were applied. Day after day the condition of the ox became worse, until death resulted on the fourth day after the operation. The autopsy showed, outside of the mentioned adhesions, a diffused, subacute, suppurative peritonitis, which must have been present before the performance of the operation, as due to the adhesions of the rumen with the abdominal wall, as infection could not have occurred during the laparotomy.—(*Veterinarius.*)

At the recent election Veterinarian T. Earle Budd was chosen School Commissioner of Orange, N. J.

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

THE PETITION OF THE ARMY VETERINARIANS TO THE WAR DEPARTMENT.

The following petition, drawn up by Dr. Wm. V. Lusk, 2nd Cavalry, after getting the desires of the army veterinarians by a circular letter of inquiry, is being circulated in the States for signature:

"We, the undersigned veterinarians of the United States Army, have the honor to request that the General Staff of the Army recommend to the present Congress a bill to fix our status and pay, and thereby render unnecessary the numerous discussions and calls for decisions which are continually being brought to the attention of the War Department. We desire to be modest in our requests and would respectfully submit the folllowing, viz.:

"That the veterinarians of the United States Army, as now provided for by law, having five years service or over, shall have the rank, pay and allowances of First Lieutenants mounted, and that those with less than five years shall be commissioned as Second Lieutenants mounted.

"Provided, that not more than half the veterinarians provided for shall be commissioned as First Lieutenants; that promotion from the grade of Second Lieutenant to that of First Lieutenant shall be made by seniority, and that no veterinarian shall be eligible for promotion to the grade of First Lieutenant until he has served five years.

"Provided, further, that service as Veterinarian in the Quartermaster's Department as Assistant Instructor in Veterinary Science at the United States Military School, Fort Leaven-

worth, Kansas, shall be counted in computing length of service.

"We feel that such a measure would be reasonable and just. It would fix our status, give us something in the future to look forward to, and encourage us in our work. As it is, we have nothing in view for the future; we are not within the pension laws, although as much exposed to danger as any officer or enlisted man; our expenses are high and our pay small, with no prospects of increase except the extra five per cent. for every five years service up to twenty years. To lay aside anything for the future under such circumstances is impossible, and, as we are not eligible for retirement, the prospects of being discharged from the service for age or disability, and without means of supporting ourselves and families, is all but encouraging.

"Again, we are denied foreign service pay, a necessary extra compensation granted commissioned officers and enlisted men in order to enable them to defray the unusual expenses incurred upon them while serving outside of the United States. This is, undisputably, a great injustice, due, undoubtedly, to an oversight on the part of Congress.

"To conclude, we respectfully request that in case it is not deemed prudent to give us rank, that something be done to correct the error relative to foreign service, and that we be granted the privilege of retiring for disability or upon reaching the age of sixty-four years. Very respectfully,

"(Signatures.)"

NOTE:—Dr. G. E. Griffin, Artillery Corps, Fort Sheridan, Ills., being the last member on the list, has been requested to forward the properly signed petition to the veterinarian who takes the place of Dr. Lusk at Fort Myer, Va., the latter being under orders to the Philippine Islands. In the meantime Dr. Walter R. Grutzman, 15th Cavalry, has taken station at that post, and to him we have to trust to officially present the petition to the Adjutant General, U. S. A., in Washington, D. C. (O. S.)

* * *

DR. ROCKOLDS' EUROPEAN OBSERVATIONS ANENT ARMY VETERINARY MATTERS.

1st Regiment U. S. Cavalry, Fort Clark, Texas, Dec. 10, 1903.

Editor American Veterinary Review:

DEAR SIR:—Having been away on a four months' leave in Europe and England, I have been unable to keep up with current events at home. From observations abroad I cannot

say that from a general standpoint the average veterinarian of the United States has anything to learn ; it is *vice versa*. There is too much of what was "good enough for my grandfather is good enough for me" over there.

In answer to the request to express views on the question of army veterinarians, my opinion is that the only correct way for them is a commssion if only as a second lieutenant. With that obtained, the position would be assured. I believe that the veterinarian would be better off as a second lieutenant at half pay than with double pay and no rank. Not that I would imply that rank makes a better man or more of a gentleman, as can be seen any day in the Army. Socially a man is what he makes himself, but officially rank counts in the service. I can in no way complain of the way I was treated by veterinarians in the services of different military organizations abroad, but must confess that it was a most difficult task to explain clearly our standing in the service to various officers in the foreign armies, and it always made me feel uneasy when asked by them about it ; especially was this true of the English army veterinarians, who have just accomplished, after many years of active agitation, what we are aiming for. There is no reason that we should not obtain quickly what they have taken so long to do with the extreme conservative methods of their War Department.

A commission, even of low rank, would be the thin edge of a wedge which could be slowly but surely driven home.

Very respectfully, COLEMAN NOCKOLDS.

"THE punctual visits of the REVIEW have been a source of great pleasure to me for several years. It is a worthy leader of our profession."—(*H. D. Fenimore, D. V. S., Los Angeles, Cal.*)

A KISS is a peculiar proposition. Of no use to one, yet absolute bliss to two. The small boy gets it for nothing, the young man has to steal it, and the old man has to buy it. The baby's right, the lover's privilege, the hypocrite's mask. To a young girl faith ; to a married woman hope and to an old maid charity.—*Burlington (Ia.) Journal.*

DR. G. E. MCEVERS, of Chicago, who formerly for nine years was first assistant to Dr. M. H. McKillip, and who has enjoyed a lucrative private practice for the past ten years, has retired to take the position of superintendent and veterinarian of Mr. B. Schrieber's stock farm, St. Louis, Mo.

THE AGE OF HORSES.

To tell the age of any horse,
Inspect the lower jaw, of course;
The six front teeth the tale will tell,
And every doubt and fear dispel.

Two middle "nippers" you behold
Before the colt is two weeks old,
Before eight weeks two more will come;
Eight months the "corners" cut the gum.

The outside grooves will disappear
From middle two in just one year.
In two years, from the second pair;
In three, the corners, too, are bare.

At two the middle "nippers" drop;
At three, the second pair can't stop.
When four years old the third pair goes;
At five a full new set he shows.

The deep black spots will pass from view
At six years from the middle two.
The second pair at seven years;
At eight the spot each "corner" clears.

From middle "nippers," upper jaw,
At nine the black spots will withdraw.
The second pair at ten are white;
Eleven finds the "corners" light.

As time goes on, the horsemen know,
The oval teeth three-sided grow;
They longer get, project before
Till twenty, when we know no more.

FAMOUS DRIVERS DEAD.—The trotting turf suffered severe loss in October when the last grip on the reins was loosened and death took off James Golden in Boston and Orin Hickok in Cleveland. Mr. Golden was but 56 years old, but since a boy of 19 he has been a trainer of horses. He was the youngest of a great school of trainers, Marvin, Hickok, Green, Turner and Splan, all of whom made their mark as trainers. Orin Hickok was really the seer of the turf. He was 80 years old, and passed away in an insane asylum in Cleveland.

SOCIETY MEETINGS.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

Our twenty-first annual meeting was held in the Sherman House, Chicago, December 2d and 3d, 1903. The meeting was called to order by the President, Dr. H. A. Pressler, at 2 P. M., Dec. 2.

The minutes of the previous meeting were read and approved, after which the President delivered his annual address.

The following were present during the meeting:

Members.—Drs. H. A. Pressler, Fairbury; R. F. Hoadley, Yorkville; W. H. Curtiss, Marengo; J. H. Crawford, Harvard; F. H. Ames, Canton; H. B. Cale, Macomb; R. W. Story, Princeton; F. H. Barr, Pana; Jas. Smellie, Eureka; J. T. Nattress, Delavan; W. J. Martin, Kankakee; N. I. Stringer, Watseka; W. F. Scott, Oak Park; J. M. Kaylor, Barry; N. P. Whitmore, Gardner; C. C. Mills, Decatur; F. A. Gibbs, Palatine; John Scott, Peoria; C. H. Merrick, Okawville; L. C. Tiffany, Springfield; F. W. Kee, Sheldon; V. E. Frizzelle, La Moille; W. H. Welch, Lexington; N. W. Kyle, Colfax; W. F. Brownlee, Little York; H. J. Mongeau, Manteno; Matthew Wilson, Evanston; C. P. Draper, Arlington Heights; Jas. Robertson, Julius Mildenberg, A. H. Baker, Jos. Hughes, S. S. Baker, A. C. Worms, T. A. Kragness, R. G. Walker, E. L. Quitman, J. F. Ryan, Chicago; W. C. Hannawalt, Sheffield; T. J. Gunning, Neponset.

Visitors.—Drs. O. E. Dyson, A. M. Casper, M. Wooden, A. Hassall, L. H. McNay, W. H. Smith, J. B. Sine, A. N. Irwin, L. E. Day, Bureau of Animal Industry, Chicago; J. Y. Lehman, Sterling; Geo. H. Smith, Streator; J. W. Griffith, Cedar Rapids, Iowa; T. D. Hinebaugh, N. Dakota; D. E. Salmon, Chief Bureau of Animal Industry, Washington, D. C.; Leonard Pearson, State Veterinarian of Pennsylvania; W. H. Dalrymple, Veterinarian Louisiana State Experiment Station, Baton Rouge, La.; Geo. W. Pope, Superintendent U. S. Quarantine Station, Athenia, N. J.; — Myers, Indiana.

The following made application for membership, and, on motion, were duly elected: Drs. T. A. Kragness and Julius Mildenberg, Chicago; F. A. Gibbs, Palatine; H. J. Mongeau, Manteno; H. B. Cale, Macomb; W. F. Brownlee, Little York, and N. W. Kyle, Colfax.

The first paper read and very freely discussed was that of Dr. R. F. Hoadley, of Yorkville, on that ever interesting subject, "Paturient Paresis." The treatment advocated as being very superior to the "Schmidt treatment" was that of injecting *air* by means of the common bicycle pump into the udder until thoroughly inflated. The doctor claimed twenty-nine recoveries in thirty cases so treated. One or two others who had tried this endorsed it as superior to any treatment yet tried.

Dr. W. F. Scott, of Oak Park, followed with the subject of "Pyæmia and Septicæmia," and in a well-written paper advocated the administration of *calcium sulphide*, ending with a couple of case reports showing the advantage of the treatment.

"Colic" was the subject of a very able and interesting paper by Dr. A. C. Worms, of Chicago, in which he confined himself to those colics of indigestion, their causes, symptoms and treatment. A very interesting discussion followed.

A good practical paper was that of Dr. C. G. Glendenning, of Clinton, on "The Value of Eserine in Veterinary Practice." In this he showed the uses as well as discussed the many abuses of this valuable drug.

Dr. Geo. W. Pope, Athenia, New Jersey, of the Bureau of Animal Industry, was present greeting old friends, and made us a very pleasant address.

Drs. W. F. Scott and C. H. Merrick, of the State Board of Veterinary Examiners, made a verbal report of their work in their official capacity.

The Society now adjourned until 8 P. M., at which time the President called the meeting to order and proceeded to introduce Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, Washington, D. C., who held the rapt attention of those present and made a very able and inspiring address. A great many of the Chicago members of the Bureau of Animal Industry were present and the address was certainly greatly appreciated.

Dr. A. H. Baker, of Chicago, one of the charter members of the Association, now took the floor, the occasion being the celebration of our twenty-first birthday. Dr. Baker gave a very interesting historical account of the Association from birth to the present. Of the present membership there remain but three who were present at its birth (Dr. J. F. Ryan, Dr. Jos. Hughes and Dr. A. H. Baker), all of Chicago.

Dr. W. H. Dalrymple, Veterinarian of the Louisiana State Experiment Station, and Dr. Leonard Pearson, State Veterinarian of Pennsylvania, were present and each made a nice talk.

The Society adjourned to meet the following morning at 9 o'clock at the Chicago Veterinary College for clinics.

Upon being reconvened at the Sherman House at 2 P. M., Dec. 3d, the first thing on the programme was a case report of Dr. W. H. Curtiss, Marengo; subject, "An Outbreak of Anthrax."

Dr. Jas. Robertson, of Chicago, read a very able and practical paper on the subject of "Corns."

The last subject on the programme was "Impaction of the Rumen," by Dr. C. D. Maulfair, McNabb.

Dr. Palmer, Secretary of the Michigan Veterinary Examining Board, was present and gave an interesting account of some experimental work on the treatment of skin diseases in cattle and sheep by dipping.

Dr. T. D. Hinebaugh, of N. Dakota, was present and made a very pleasant talk.

Report of the Treasurer showed balance on hand of $84.59.

The following bills were allowed: Dr. W. J. Martin, expenses Legislation Committee, $15; Dr. H. A. Pressler, expenses Legislation Committee, $15; printing circulars and invitations, $8; Secretary's fees, $10; stamps, $10; Sherman House, rent of room, $15. Total, $73.

Dr. A. H. Baker, W. J. Martin and N. I. Stringer audited the Treasurer's books and reported same O. K.

The President appointed Dr. W. J. Martin, T. J. Gunning and S. S. Baker a committee to draft suitable resolutions on the death of Dr. T. B. Newby. The following was unanimously adopted:

"WHEREAS, It has pleased the Great Creator of Heaven and Earth to remove from our midst, our late friend and professional brother, Dr. T. B. Newby, of Chicago; Be it

"*Resolved*, By the Illinois State Veterinary Medical Association in annual convention assembled that we sincerely condole with the family of our late lamented brother, in this their hour of trial and affliction, and devoutly commend them to the keeping of Him who looks with pitying eye upon the widowed and fatherless.

"*Resolved*, That in our natural sorrow for the loss of a faithful and honored friend, we find consolation in the belief that it is well with him for whom we mourn.

"*Resolved*, That while we deeply sympathize with those who were bound to our departed friend by the nearest and dearest ties, we share with them the hope of reunion in that better

world where there are no partings, and bliss ineffable forbids a tear.

"*Resolved*, That these resolutions be spread upon the records of this Association and a copy be transmitted to the family of the deceased.

W. J. Martin
"S. S. Baker } *Committee.*"
"T. J. Gunning

The following officers were elected for the ensuing year:

President—Dr. A. H. Baker, Chicago.

Vice-President—Dr. T. J. Nattress, Delavan.

Secretary—Dr. W. H. Welch, Lexington.

Treasurer—Dr. R. G. Walker, Chicago.

Board of Censors—Drs. H. B. Cale, Macomb; F. H. Barr, Pana, and E. L. Quitman, Chicago.

President-elect Baker was now called to the chair and appointed the following committees:

Programme.—Drs. W. J. Martin, Kankakee; C. A. Pierce, Elgin; and N. I. Stringer, Watseka.

Arrangements.—Drs. John Scott, Peoria, and F. H. Ames, Canton.

Legislation.—Drs. A. C. Worms, Chicago; E. J. List, Havana; and R. W. Story, Princeton.

A vote of thanks was given Dr. Salmon and all the retiring officers. Peoria was selected for the semi-annual meeting on February 23d. Society adjourned to meet at Peoria February 23d.

W. H. WELCH, *Secretary.*

LICENSE TO PRACTICE IN NEW JERSEY.—Veterinarians desiring to practice veterinary medicine, surgery and dentistry in the State of New Jersey should make application for license to the State Board of Veterinary Medical Examiners without delay. The Board will conduct examinations for license in the Capitol at Trenton, January 22d and 23d. Those who fail to take the January examinations will not have another opportunity to obtain license until some time in June, as the Board only holds examinations twice each year. Dr. Whitfield Gray, Newton, is Secretary, and Dr. William Herbert Lowe, Paterson, is President. The office of the Board has been established at Paterson, N. J., the President's office. There is said to be a number of good locations in country towns open for well-qualified veterinarians in New Jersey, where there is either no practitioner at all or one who is not up to date in his knowledge and methods of modern practice.

NEW JERSEY SANITARY ASSOCIATION.

At the meeting of this Association, which occurred at Lakewood, Dec. 5, Dr. William Herbert Lowe, of Paterson, Chairman of the Committee on Animal Diseases and Animal Foods, presented the following report:

"*Mr. President and Gentlemen:*

"The chairman of your committee had the honor two years ago of reading a paper before the Association entitled 'Progress in Veterinary Medicine in its Relation to Public Health.' After the presentation and discussion of the paper the Association, in view of the great importance and necessity of the subject, decided to establish a committee on Animal Diseases and Animal Foods, which committee now begs to make its report, although of necessity it must be somewhat preliminary, as the magnitude and various aspects of the work of this committee are simply inexhaustible. Anything commensurate with the importance of the subject is quite out of the question at the present time.

"At the outset we must first recognize the fact that animal diseases and animal foods are largely agricultural or veterinary problems; and in the second place the control of communicable diseases and the production of sound and wholesome food products is essential to the health, comfort and life of civilized man, for any community without a wholesome meat and milk supply is in an unfortunate predicament. The qualified veterinarian is the natural expert on animals and animal food products, because he makes a special study of animal life and comparative medicine, understands animal pathology, and he is the one who has to be relied upon to diagnose and deal with communicable animal diseases.

"It is a deplorable fact that the general reputation of the veterinary profession in this State in the past has not been good. This has been caused in a great measure by the ignorance and deportment of untaught and unworthy veterinarians themselves. The enlightened public are not slow to recognize ability, education and skill, but they will not tolerate untaught and unworthy men, especially when they pretend to understand a science and undertake to practice an art that they know little if anything about.

"The Legislature of New Jersey placed a law upon the statute books (Chapter 18, laws 1902) regulating the practice of veterinary medicine in this State that will protect the public

from imposition and encourage qualified and worthy veterinarians.

"Among the subjects that this law requires veterinarians to be examined in are chemistry, bacteriology, hygiene, sanitary medicine and meat and milk inspection. Veterinarians in order to be eligible to take this examination must be graduates of a recognized veterinary college or university, giving at least a three-year course in veterinary medicine.

"The allied profession of human medicine is making commendable and notable advances in the matter of the appointment of qualified medical men as health officers, inspectors, etc., and there is no good reason why qualified veterinarians should not be selected to make veterinary examinations. The examination of milk, meat and other animal products has too long been left in the hands of laymen and others who have had no special education or training in veterinary and sanitary science. Meat and milk inspectors should be qualified veterinarians, and not butchers and laymen, who know little if anything about the science whose province is to study animal diseases and animal foods. Milk inspection should begin with the animal that produces it, and not with the product, as is commonly practiced. The interests of the producer have to be considered as well as the interests of the consumer.

"The division of authority in this State in regard to the investigation and control of animal diseases, the official recognition and encouragement of animal husbandry and the dairy interests, as well as of veterinary sanitary matters in general, is, in the opinion of your committee, exceedingly confusing and sometimes causes a good deal of delay, resulting in injury to live-stock owners as well as endangering public health through loss of time in reaching the proper authority to deal with some particular aspect of the subject.

"The Veterinary Medical Association of New Jersey, at its last annual meeting, held at Trenton, last January, considering the dangers of transmission of animal diseases to man through the meat and milk supply and the best interests of animal husbandry and industry, recommended that there be established at Trenton a State Bureau of Animal Industry whose executive officer should be a qualified veterinarian; that this bureau be connected with either the State Board of Agriculture or the State Board of Health, as might seem best; that this bureau be charged with all the veterinary sanitary work of the State. A conference committee of the Veterinary Medical Association of

New Jersey has been appointed to confer with the heads of the several departments and others concerned, with a view of reaching an amicable and satisfactory understanding, whereby all branches of this service could be merged into one bureau under veterinary direction and supervision without interfering with the present organization of the respective State boards or departments.

"It is thought that if a State Bureau of Animal Industry could be organized with a veterinary chief, as at Washington, it would be a great step in advance, both in reference to scientific regulation and economical administration.

"The scope of the work would be enlarged, unnecessary work dispensed with, and duplication now existing in the several boards would be eliminated. If the field and function of the new bureau were defined clearly it would prevent any encroachment by it upon other bureaus, or by other bureaus upon it. The veterinary profession of New Jersey does not seek to create a new board or department of the State government, but it favors the establishment of a bureau, under veterinary direction, charged with the animal industry and the veterinary sanitary work of the State. In this movement New Jersey has the precedent of at least one adjoining State, Pennsylvania, and a number of sister States throughout the country. Whenever such a bureau or board has been organized, it has brought about a marked improvement over the system which preceded its establishment. In Pennsylvania the regular appropriation to the State Live Stock Sanitary Board is $45,000 per annum. Last year the legislature of that State appropriated $25,000 additional with which it is proposed to establish an experimental station and conduct a farm for researches in vaccination against tuberculosis and for other lines of research.

"According to the Bureau of Animal Industry report from the census of 1900 there are in the State of New Jersey 165,000 milch cows; 74,000 other cattle; 74,000 horses; 48,000 mules; 175,000 swine and 41,000 sheep. The value of these animals in round numbers is sixteen million dollars. It is an investment of such importance from a financial point of view alone, that it is deserving of consideration and attention of the State authorities. Then there is the money value of the milk and other animal products, sent largely to the cities of New York and Philadelphia, to be considered. The public health side of the question cannot be estimated in dollars and cents, but in the health and lives of the human population.

"The example of the United States government in estab-

lishing the Bureau of Animal Industry with a qualified veterinarian as Chief of the Bureau, and the wonderful results achieved under his intelligent and sagacious direction, demonstrates the advantages of such a bureau to the producer, consumer and the general public.

"The work of this great bureau of our national government in original investigation of animal diseases, animal foods, in the veterinary inspection and extermination of contagious bovine pleuro-pneumonia, contagious foot-and-mouth disease and other animal plagues, in the betterment of the general conditions of the dairy industry of the country, in meat inspection for interstate and export trade and in the inspection and quarantine of imported animals, are branches of its service well known to sanitary scientists at home and abroad. The lesson your committee would draw from reference to the activities and functions of the Bureau of Animal Industry is that we may profit in New Jersey by learning what the federal government is doing for animal husbandry and modern veterinary science.

"There is no question but that New Jersey is more exposed to danger from communicable animal diseases than most other States. The quarantine station of the United States Government, at which nine-tenths of the animals imported into the United States, which are liable to bring in contagious diseases, are quarantined, is located at Athenia, near Paterson, in this State. This station being inland, there is danger of dissemination of disease along the railroad in case of animals being infected. There is the danger of attendants carrying the contagion out of the quarantine station.

"Then the State of New Jersey being at the Port of New York, where a large number of ships land at the docks on the Jersey side of the river, we are peculiarly exposed to contagion from articles of merchandise, like hides, wool, hair, etc. Enormous quantities of hides, wool, hair, and other animal products are continually being shipped to the contiguous States and carted from railroad stations to mills and factories, and such shipments are continually going through our State. Cases of anthrax are liable to occur in tanneries and in woolen mills among operatives who have to handle these products. Anthrax is a disease that has to be taken care of when it develops and the soil not allowed to become infected. An alluvial soil is peculiarly adapted to the propagation of anthrax, where the germs can multiply in the soil and the weather conditions are such as to bring these germs to the surface. In the summer time

there are liable to be outbreaks of the disease among the domestic animals, not only threatening the animals, but the general health of the people. A serious outbreak of anthrax occurred in South Jersey last summer, which was promptly brought under control by the State Board of Health.

"The recent outbreak of foot-and-mouth disease in the New England States is an illustration of the danger to which New Jersey is constantly exposed. There is just as much, if not more, reason to expect an outbreak of foot-and-mouth disease at any time in New Jersey as there was in Massachusetts.

"Another disease which is liable to be introduced in New Jersey at any time is a venereal disease of horses which exists in some of the Western States. It has been diagnosed *maladie du coit*, or disease of coition, as it is termed by the French.

"Rabies is a disease that is prevalent in certain parts of New Jersey, and one that measures should be taken to exterminate. It has been prevalent during the past year in my city—Paterson. A number of individuals have been bitten and one boy died not long since, notwithstanding the fact that he had received the Pasteur treatment.

"I will not detain you now to even mention the diseases that are communicable from animal to man, beyond saying that the State Board of Health is by strenuous efforts restricting and suppressing the dreadful ravages of glanders in the large cities in the northern part of our State. The Commission on Tuberculosis in animals is doing a good work in exterminating infection in dairies and in the inspection and testing of dairy cattle shipped into New Jersey. Both bodies, however, are handicapped for want of necessary funds to prosecute the work in a proper and efficient manner."

PASSAIC COUNTY VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting took place at 169 Paterson Street, Tuesday evening, Dec. 1, 1903, with President William Herbert Lowe in the chair, and the following members answered to roll-call: Drs. William J. Reagan, John H. Degraw, Wm. Herbert Lowe, Paterson; J. Payne Lowe, Passaic; Wm. J. Fredericks, Delawanna.

The minutes of last meeting were approved as read.

Dr. Wm. Herbert Lowe reported that Dr. George W. Pope, of the United States Quarantine at Athenia, N. J., was a delegate

to the Illinois State Veterinary Medical Association. We expect to receive a good report from him when he returns home. The State veterinary meeting will be held on Thursday, Jan. 14, 1904, at Trenton, N. J. Dr. Reagan's paper on "Poisoning in the Dog" and other papers and reports have appeared in the recent issues of the REVIEW.

Dr. William E. Brock was arrested at Rutherford in October for practicing veterinary medicine without a license.

There was a request made that all practitioners have photographs taken of all interesting cases and bring such before the meeting so that they may be thoroughly discussed.

The following report from Chief State Veterinarian Wm. Herbert Lowe was presented:

"*Glanders.*—Watering fountains and troughs have been closed in the large cities in the infected districts. Troughs in the city of Paterson have been closed since Aug. 13 as a preventive measure against the introduction of glanders into the city. Disinfection and whitewashing of blacksmith shops and hotel sheds and stables recommended. All drivers should carry their own water pails for watering their horses, and this will greatly help the veterinarian to stamp out the disease.

"*Rabies.*—Prevalent in Passaic County. The State Veterinarian has had a number of examinations and inoculations made at the State Laboratory of Hygiene at Trenton and the affected dogs have been destroyed. One of the several children who were bitten in Paterson and sent to Pasteur Institute in New York died, notwithstanding the treatment.

"*Tuberculosis.*—If practitioners will report cases of tuberculosis in dairy cows, the State Veterinarian will arrange to have the tuberculin test made and the diseased animals condemned and destroyed by the State.

"*Actinomycosis.*—The State Veterinarian reported that he had a recent case of this disease, and wished all veterinarians would report such cases promptly."

As there was no other business, meeting adjourned to Jan. 5, 1904. WILLIAM J. FREDERICKS, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION.

On September 3 a semi-annual session of this Association was held in the parlors of the Park Hotel, Columbus, Ohio.

The specific purpose of the meeting was the consideration of a wide-spread feeling that our Constitution and By-Laws should be changed.

The meeting was called to order by the President, Dr. J. H. Blattenburg, at 10.15 A. M., with the following members present: J. H. Blattenburg, Lima; Louis P. Cook, Cincinnati; W. E. Clemons, Granville; L. W. Carl, Columbus; Harry Fulstow, Norwalk; Wm. H. Gribble, Washington C. H.; T. B. Hillock, Columbus; R. C. Hill, West Alexandria; N. Wells Hillock, Columbus; C. E. Inskeep, Urbana; J. E. Johnson and F. J. Kyle, Springfield; C. E. Leist, Columbus; S. D. Myers, Wilmington; F. F. Sheets, Van Wert; Walter Shaw, Dayton; David S. White, Columbus; J. A. Meagher, Glendale.

Such a large number of proposed changes were presented as to practically constitute a complete new set, and in view of this fact the following was prepared, attached to a copy of the existing laws, and offered for consideration: "We, the undersigned, request that at our next annual session our present Constitution and By-laws be presented to the Association for amendments, repeals, additions, or any other changes that that body may in its judgment see fit to make. (Signed) J. H. Blattenburg, W. H. Gribble, L. W. Carl, W. Shaw, T. B. Hillock, H. Fulstow."

An argument now sprung up as to whether the proposed changes must be accepted or rejected as they are, or whether they could be amended and then legally passed upon at the annual session. "Roberts' rules of order decide that they may be amended, but the amendment must be germane to the original amendment."

In order to save time, a committee of five was appointed to consider all the proposed changes and report at the annual meeting what in their judgment was for the best interests of the Association.

No further business appearing, the Association adjourned to attend the State Fair. WM. H. GRIBBLE, *Secretary.*

* * *

The twenty-first annual session of the Ohio State Veterinary Association will convene in the Veterinary Laboratory Building on the campus of the Ohio State University, Columbus, Ohio, Jan. 12 and 13, 1904. The sessions already held at the University speak for themselves, and need no comment here; "nuf sed."

Besides the election of officers, reading of papers and the clinics, etc., there will come up for consideration almost a complete change in the Constitution and By-Laws. Some changes are simply in the wording, others immaterial; but we do desire

to call your attention to two of them: one in reference to officers, and the other to qualifications for membership.

"*Officers.*—Reducing the number of vice-presidents from three to one; and adding three censors, who shall examine the credentials of all applicants.

"*Qualifications.*—All applicants shall be legal practitioners of Ohio and be graduates of veterinary schools having a curriculum of not less than three years of six months each, with at least four qualified veterinarians on the teaching staff, each lecturing not less than three times each week during the college year."

Every member should arrange to be present, and with voice and vote sanction or condemn these proposed changes.

WM. H. GRIBBLE, *Secretary.*

NORTH CAROLINA VETERINARY MEDICAL ASSOCIATION.

This Association met in Wilmington, July 28 and 29, 1903, in the Elks' Home. Many subjects of local interest were discussed and disposed of, *i. e.*, further legislation, Texas fever, municipal meat and milk inspection, etc.

The members of the Association feel much encouraged over the passage of our veterinary bill and the establishment of the Board of Examiners by the last legislature.

The election of officers resulted as follows:

President—Dr. J. W. Petty, Greensboro.

Vice President—Dr. C. J. Fleming, Winston.

Secretary—Dr. T. B. Carroll, Wilmington.

Treasurer—Dr. W. C. McMackin, Raleigh.

The Association adjourned to meet in Greensboro in July, 1904.

The State Board of Examiners met on the afternoons of the 28th and 29th. Dr. Tait Butler, of Raleigh, was chosen Chairman, and Dr. T. B. Carroll, of Wilmington, Secretary.

Four applicants for State Board certificates were examined and one certificate was granted—Dr. F. S. Charter, of High Point.

The Board will meet once a year at the time and place of the Association meeting. J. W. PETTY, *Secretary.*

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The annual meeting of this Association will be held at the Trenton House, Trenton, N. J., January 14, 1903, at 10 A. M.

The following are a few of the features which will be presented to those who are in attendance:

"Insects that are the Carriers and Cause of Animal Diseases," by Prof. John B. Smith, State Entomologist.

"Modes of Tubercular Infection in Wild Animals," by Dr. W. Reid Blair, Veterinarian and Resident Pathologist N. Y. Zoölogical Park.

"Forage Poisoning—So-called Cerebro-Spinal Meningitis," and "A Case of Supposed Tuberculosis in Horse with Results of Post-Mortem," by Dr. R. J. Halliday, Bayonne.

"Echoes from the New Jersey Sanitary Association Meeting," by Dr. L. E. Tuttle, Bernardsville.

"Report Concerning the Outbreak of a Peculiar Disease in Ocean County," by Dr. Chas. H. Perry, Lakewood.

"The Neglected Use of Anæsthetics in Veterinary Practice," by Dr. George W. Pope, Athenia.

Reports of various delegates and committeemen.

As a clinic Dr. R. E. Waters, of Gravesend, L. I., will operate on a cryptorchid provided a suitable subject can be secured.

GEO. W. POPE, *Secretary.*

ILLINOIS VETERINARY MEDICAL AND SURGICAL ASSOCIATION.

The fifteenth annual meeting will take place at the St. Nicholas Hotel, Decatur, Wednesday and Thursday, Jan. 13 and 14, when the following programme will be presented: "Fracture of Limbs," Dr. C. A. Hurlbutt, Stonington; "Horse Shoeing," Dr. R. W. Brathwaite, Champaign; "Hypodermic Stimulation," Dr. N. P. Whitmore, Gardner; "Open Joint," Dr. J. M. Reed, Mattoon; "Canine Distemper," Dr. A. Travis, Litchfield; "Contagious Opthalmia" (Bovine), Dr. F. D. Bliss, Earlville; "Parasitic Vulvites" (Bovine), Dr. John Turrell, Mackinaw; "Diagnosis of Lameness in the Horse," Dr. W. J. Martin, Kankakee; "Summer Sores," Dr. J. W. Marsh, Illiopolis; "Erysipelas," Dr. I. M. Luzador, Nokomis; "Spasms of the Glottis," Dr. F. Glassbrenner, Alton; "Quittor," Dr. D. K. Goodale, Mt. Vernon; report of cases.

KANSAS TO HAVE AN ASSOCIATION.

A call has been issued by Veterinarians N. S. Mayo (State Veterinarian), Manhattan; Richards, Emporia; Pritchard, Topeka, and Maxwell, Salina, for a meeting of all graduates in the

State of Kansas to be held at Topeka, Jan. 13 and 14, 1904, for the purpose of effecting a permanent organization.

Dr. Hugh S. Maxwell says in a note to the REVIEW, that every veterinarian known to the signers was addressed, though some may have been omitted through lack of knowledge of their existence. Therefore, he hopes that all who are eligible and who have escaped being notified, will lend their aid to the effort.

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION.

This Association held its regular quarterly meeting Dec. 9, 1903, at the Palace Hotel, Room 1000, San Francisco, and it being the annual meeting, the following officers were elected for the ensuing year:

President—Charles H. Blemer.

Vice-President—R. A. Archibald.

Secretary—P. H. Browning.

Treasurer—Wm. F. Eagan.

Board of Examiners—H. A. Spencer, David F. Fox, Edward J. Creely.

The committee on Constitution and By-laws submitted its report, which was accepted.

The Judiciary Committee reported seven (7) convictions for violation of the new veterinary law of the State. Upon motion, the report of the Committee was accepted and the committee was complimented for its efficient work.

It was voted that the Association should publish a quarterly bulletin, under the name of the *Quarterly Bulletin of the California State Veterinary Medical Association*, said bulletin to be distributed at large to the veterinary profession of the State, its object being the elevation of the profession.

Dr. H. A. Spencer, of San Jose, read a very interesting paper on "Veterinary Fools, and their Influence on the Profession," which received considerable discussion.

Dr. A. S. Williams, of Marysville, read a paper on "Little Pills."

Dr. R. A. Archibald, of Oakland, read a paper entitled "No Title," which highly pleased the members of the Association.

The following members were selected to read papers at the next regular meeting, the subject to be selected by them: Drs. Creely, Welsh, Donnelly, McCullum, Sorrinson.

A judiciary committee, consisting of Drs. Archibald, President; Creely, Fox, Blemer and Browning, was appointed by the

chair to serve one year.

The Association is meeting with the hearty support of the profession throughout the State, and the meetings are largely attended. P. H. BROWNING, *Secretary.*

IOWA STATE VETERINARY MEDICAL ASSOCIATION.

The sixteenth annual meeting of this Association will be held in Des Moines, Jan. 27th and 28th. A varied and interesting programme is assured, and the clinic will be more than usually instructive. HAL. C. SIMPSON, *Secretary.*

NEWS AND ITEMS.

JUDGE WM. H. MOORE'S horses won $3880 in prizes at the recent Madison Square Garden Horse Show.

HORSE life insurance has, in the main, been disastrous to every capitalist who has tackled it, and after taking advantage of experience gained, both in Europe and America, horse life insurance is still an experiment.

WILLIAM M. WARREN, general manager of the large drug manufacturing house of Parke, Davis & Co., of Detroit, Mich., died Nov. 11, aged thirty-nine years. He entered their employ when seventeen years old, and rose to the highest position in the great establishment by personal worth, and to his wonderful executive ability is largely due the phenomenal success which has fallen to this house in recent years.

NO DOCKED HORSES IN THE ARMY.—Just before his retirement from the command of the United States Army, Gen. Nelson A. Miles issued an order forbidding the docking of tails of army horses. "Any alterations in the length or shape of the tails, manes or forelocks of public horses by docking, banging or clipping is hereby prohibited and only such reasonable trimming and plucking as may be necessary to prevent shagginess of appearance will be permitted." The army regulations forbid the purchase of dock-tailed horses by purchasing agents.

THE handsome and well appointed new club house of St. Paul's Church Club, Paterson, N. J., was formally opened Nov. 9, 1903. Dr. William Herbert Lowe, President of the club, welcomed the members and guests in a few well chosen words, and addresses were made by Rev. Stuart Hamilton, Rector of St. Paul's Church, Hon. John W. Griggs, Attorney-General of the United States under the McKinley administration and former Governor of New Jersey, Judge Francis Scott and Judge

William I. Lewis; after which the house was thrown open to members and their guests. The club has a membership of 250 men and a waiting list. Bowling alleys, shuffleboards, pool, billiards and other games are provided in the new club house, which has become one of the most popular clubs among the young men of the city.

"Now" is the name of a journal published in San Francisco, called by its editor "a journal of positive affirmations" and having as its motto "I am an unfolding soul." In a recent issue it has this to say about physicians: "A modern sickness treated in the modern style is one of the greatest travesties on common sense in the world of thought, unless it is some of the inanities of the religious creeds. One of the greatest burlesques of our day is to see a spectacled, be-whiskered, plug-hatted, long-tail-coated son of Esculapius engaged in a scientific combat over disease." Well, "Now!" Wouldn't it be interesting to see this "unfolding soul" wrestling with a plain attack of inflammatory rheumatism or some other painful affection?—(*Iowa Health Bulletin.*)

THINKS AN INJUSTICE IS BEING DONE TWO-YEAR-SCHOOLS. —The following letter from a Western subscriber explains itself. It is published *verbatim, et literatim, et punctuatim*, with the omissions only of his name and address, and the name of his deceased preceptor, whose memory we will permit to rest, in conformity with our correspondent's plea: "If you People intend to have me renew My Subscription for the American Veterinary Review, you will have to quit Runing down two year Veterinary College's and two year Graduates' as you well understand that the best Practitioners too day are two year men, and what is your object in runing down a first class Man like ——— ——— ——— Who is far Superior to very many of you hot air Journalist's and no Gentlemen will tel wrong Story's about a good Man after he is dead and gone. "Let the dead rest,, I will admit that a three year School is not one minute to long to obtain a good Veterinary Education. This three year night School's Graduates that you are beging for all the time I met in the Philippine Islands. "The work they did on the Islands looked as if they did obtain their Education in the night time. Poor Sticks! One of the Teachers a Drunken felow of this wonderful Three year Night School was operateing before the class on aridgeling he run in his cruel hand I have got the ball as he expressed it and pulled out a dung Ball. yours truly. Business is good ——— ——— ———"

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Doctor, when you have a Horse or Dog suffering from

KIDNEY, BLADDER OR URETHRAL TROUBLE

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ANY IRRITATION or INFLAMMATION of the URINARY TRACT

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DOSE:—For Horse, one half to one ounce three times a day.

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AMERICAN VETERINARY REVIEW.

FEBRUARY, 1904.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, Dec. 15, 1903.

The medical world, and the veterinary world in particular, has been agitated of late by the ever-important question of tuberculosis and its hoped-for treatment.

Dr. Marmoreck, one of the Chiefs of Laboratory at the Pasteur Institute, is well known to veterinarians by his discovery of the antistreptococcic serum, which, under his name, has for some time been used in the treatment of anasarca. At the time of the discovery it was supposed that the treatment would apply not only to that form of disease, but to all affections of the same nature; that is, to diseases with streptococci.

Ligniéres, however, soon brought out the fact that if Marmoreck's serum was very active against anasarca in horses, its action against strangles was much less satisfactory; and Ligniéres concluded that it was necessary to establish two well-differentiated groups in the family of pathogenous streptococci—one including the *Streptococcus pyogenes* and the other the *S. equi* of Shutz.

Of course new investigations were started. As Nocard remarked in a communication that he made on the subject in June, 1903: "The serum of Marmoreck came from horses hyperimmunized with repeated injections of cultures of human strep-

tococcus with increased virulence; it might be supposed to be efficacious against all the other infections due to streptococci of the same type; however, experience soon showed that this serum, still always identical to itself, did not always give the same good results; at times very efficacious in small doses, it had in other cases to be injected in very large quantity to obtain a noticeable effect; sometimes even it seems to remain entirely inactive. This irregularity of action necessitated a change in the mode of preparation of the serum. Instead of utilizing only one type of streptococci to immunize horses, Marmoreck injected in them cultures of all the human streptococci he could get."

"Practice having shown that this polyvalent serum thus obtained gave better and more constant results than the monovalent, cultures of streptococci of strangles origin were also injected to the horses," and in all reports the results have been satisfactory. Anasarca and strangles are amenable to the treatment by the polyvalent serum of Marmoreck.

* * *

For us veterinarians, this is a grand result obtained. But this discovery of Marmoreck is not the only one in which he has been engaged. Tuberculosis is, among many diseases, one which has occupied the attention of the workers of Pasteur Institute, and Dr. Marmoreck, in the month of November last, presented to the Academy of Medicine a sensational communication on a new serum—*an antituberculous serum.* No doubt the results obtained in the laboratory are very interesting, but the clinical are very doubtful and very open to contradiction.

True tuberculin, said Dr. Marmoreck, has to this day escaped our investigations, because the bacillus was not cultivated in a media sufficiently similar to natural conditions. But if young tuberculous bacilli are cultivated in appropriate and special media, like one made of leucotoxic serum of calf and of glycerinated liver bouillon, a culture is then obtained in which tuberculin is no longer present, but instead another toxine which kills small animals, and to which tuberculous individuals no more than healthy ones are sensitive to. Rabbits and guinea-pigs can be

immunized with this toxine against a later bacillar infection. Horses are immunized with these filtrated cultures, free from bacilli, but containing the toxine, and an antitoxic serum is obtained. It is with this last that attempts have been made to cure, first tuberculous animals, and then later man.

But, besides the antituberculous serum, Dr. Marmoreck has prepared an *antituberculous vaccine.* The bacilli treated for a long time by the leucotoxic serum, being treated and added to the antituberculous serum, become assimilable and are resorbed without giving rise to the ordinary abscesses and without general infection. They are vaccines against later infection. A rabbit has remained refractory, so far, for two months. According to Dr. Marmoreck, the results obtained on animals are recorded as follows: "The serum has a preventive and curative action. A dose of 15 to 20 c.c. given three days before the intravenous injection, protects definitely a rabbit against tuberculous infection. The curative treatment requires doses so much larger when the infection is older."

The results obtained in man are very uncertain. In meningitis there were none. In surgical tuberculosis they were somewhat better. In numbers of cases, even advanced, improvement is claimed, whether in pulmonary or pleural types. Out of 2000 injections that he has made, he had abscesses only in two cases.

* * *

The question and the subject was too important to remain limited only to the communication made before the Academy, and, although it was reported that the honorable body, considering that Dr. Marmoreck had been too hasty in his conclusions, had refused to accept the report of the Doctor; it was sure that others would certainly bring the subject again before the medical world at least. And on December 1, one of the celebrities of Paris, Dr. Dieulofoy, came forward and in a short but decisive discourse broke to pieces the conclusions made by the late Chief of the Pasteur Institute.

During the months of August, September and October seven

tuberculous patients were treated at the Hospital of the Hotel Dieu, where Dr. Dieulofoy has his ward. Of these patients, four had pulmonary tuberculosis, two had lesions in the lungs and in the larynx; one had pleural affection with effusion. The treatment was carried out by Dr. M. himself, and as he saw fit.

By close observation, frequent auscultation, and repeated minute examinations, the following are advanced by Dr. Dieulofoy: "(1) The serum has no favorable effect on the fever of tuberculous subjects. In one of them it caused a high elevation of temperature. (2) The serum has no influence on expectoration; in some cases it has been treble and quadruple after the injections. (3) The serum does not seem to have any effect on the development of the tuberculous lesion. (4) It has no influence on nutrition; the patients have continued losing flesh, and at times more rapidly, notwithstanding over-alimentation. Of the seven patients, since the treatment, two are still living, but are very sick; the other five are dead. As far as the test on animals," continues Dr. Dieulofoy, "two lots of guinea-pigs, four in each, were inoculated and became tuberculous by subcutaneous injections of human sputa. The first lot was submitted to the injections of serum, while the other was kept as witnesses; not only the injected serum, did not prevent tuberculosis from progressive and very rapid evolution in the inoculated subjects, but their death took place even before that of the witnesses."

* * *

Such was the important clinical and experimental result which was reported, and no doubt, notwithstanding the timid defense of one or two other members of the Academy, it was evident to all that the treatment by the antituberculous serum had received a blow from which it will be hard to recover.

* * *

A few days ago I received the 19th Annual Report of the Bureau of Animal Industry—the report of 1902.

Like all its predecessors, it forms a large volume of over 600 pages, neatly gotten up, illustrated, and is a handsome addition

to that part of veterinary literature which illustrates the work carried out by the small army of scientists led by Dr. D. E. Salmon.

The report of the Chief is a kind of introduction, an index, and also a general review of the work of the year, resuming as it does consideration of the doings of the various divisions of the Bureau. The Inspection Division, for instance, leads us into what has been executed in the meat inspection, microscopic inspection of pork, that of vessels, of exported and of imported animals, the control of contagious diseases. In a second part comes the Biochemic Division, with its preparation and distribution of tuberculin, mallein, tetanus antitoxin, etc. In the third, we find the Division of Pathology, the most interesting part to veterinarians. Among the most important points of the work of this division, I read the investigations on an apoplectic form of septicæmia of chickens, on the infectiveness of milk from cows which have reacted to the tuberculin test, on the comparative virulence of tubercle bacilli from human, bovine, ovine, porcine and simian sources, on a fatal enzoötic among cattle in a herd in the vicinity of Washington, on a fatal disease among angora goats, on dourine in Nebraska, etc., etc. In a fourth chapter comes the work of the Zoölogical Division ; in the fifth the Bureau Experiment Station, and in the last the Miscellaneous Division, with the Quarantines, and finally the Milk Division.

All this is the *entrêe en matières*, then comes the heavy work. Let me mention only a few articles : "The Work Against Sheep Scab in 1902," by E. B. Jones ; "Scabies in Cattle," by R. W. Hickman ; "The Duration of the Life of the Tubercle Bacillus in Cheese," by T. C. Harrison ; "A Report on an Enzoötic among Cattle caused by a Bacillus of the Enteridis Group," by J. R. Mohler and J. S. Buckley, which concludes : (1) That a spontaneous enzoötic among cattle resulting from a bacillus of the enteridis group ; (2) that this organism has been isolated from cattle in pure culture ; (3) that when inoculated into susceptible experimental animals, a similar disease has been reproduced, from which the specific bacillus was discovered ; (4) that

it is pathogenic for rats, guinea-pigs, rabbits, pigeons, dogs, sheep, hogs and calves, but is not infectious for chickens; (5) that the organism isolated from this outbreak is more virulent than that usually obtained from hogs affected with hog cholera, and is pathogenic for a greater number of species; (6) that a closely allied disease has already been described by Thomassen as an enzoötic among bovines.

Dr. Salmon also contributes the report he presented before the American Public Health Association on "Bovine Tuberculosis and Other Animal Diseases Affecting Public Health"; and afterwards Dr. J. R. Mohler and H. J. Washburn published a preliminary report on the nature, symptoms, cause, prevention and so forth of takosis, a contagious disease of goats recently observed, with the following conclusions: "(1) That a disease described as takosis has appeared in many parts of this country, but particularly in the Northern States; (2) it is a progressive, debilitative, contagious disease, characterized by great emaciation and weakness, with symptoms of diarrhœa and pneumonia, and causes a mortality of 100 per cent. of those affected, and from 30 to 85 per cent. of the whole flock; (3) from the carcasses of numerous animals that have succumbed to this disease a new organism, *Micrococcus caprinus*, has been recovered in purity and is presumably the etiological factor; (4) the micrococcus possesses pathogenic properties for goats, chickens, rabbits, guinea-pigs and white mice, but not for sheep, dogs or rats; (5) although the disease has been described before, so far as could be ascertained no bacteriological investigations have been previously made; (6) medicinal treatment was attempted with varying success; immunizing experiments are highly encouraging."

A longer review of this work would cover more space than I feel this chronicle can allow, and, yet, I must mention the report on foot-and-mouth disease of Salmon, the Voges' description of mal de caderas, by Ch. Wardell Stiles, and what not.

Speaking of one of the last reports, a European journal, which published a review of it, said: "When will similar pub-

lication take place here?" I wonder what he will exclaim when he sees the 19th Annual Report.

* * *

I have received from Prof. Dr. H. de Ratz, General Secretary of the Eighth International Veterinary Congress, which is to be held at Budapest in 1905, the programme of the questions which will be discussed, in the following order :

I.—Veterinary Sanitary Police.

1. Insurance of cattle (general, private and that of cattle for butchery).

2. Uniform form for periodical sanitary veterinary bulletins.

3. The establishing of uniform principles for estimation of the reaction of tuberculin and mallein.

4a. Prophylaxy of tuberculosis of domestic animals.

4b. Vaccination against tuberculosis of bovine.

5. Vaccination against foot-and-mouth disease.

6. Prophylaxy of pneumo-enteritis of swine; vaccinations.

7. Extension of the restrictions of traffic at the apparition of diseases which have no immediate contagious character, and especially of bacteridian anthrax.

8. Prophylaxy and stamping out of rabies.

II.—Biology.

1. Milk and its treatment, in relation specially with the reform in milking, according to hygienic conditions.

2. Nutritive value of lean milk for live stock (in fattening or raising), specially for the various breeds of swine.

3. Falsification of the meat and products. The new means of examination.

4. Feeding with molasses.

5. Hygiene of stables and of the bedding. Critics on the different beddings.

6. Feeding in stable and in the field to the biological point of view.

III.—Pathology.

1. Relations of tuberculosis of man with cattle, fowls, and other domestic animals (especially dogs.)

2. Modes of infections of tuberculosis of domestic animals.

3. Milk and its products as propagators of tuberculosis.

4. Importance of the bacteria resisting to acids and resembling the bacillus of tuberculosis in researches.

5. Serotherapy of infectious diseases of domestic animals.

6. Cancer of domestic animals.

7. Pulmonary glanders and other tuberculous formations of the lungs.

8. Tropical diseases of domestic animals.

9. The part played by protozoæ in diseases of animals.

10. Toxic matters, produced by the parasites of animals.

11. The last experiments on the transmission of the diseases of animals to man (taking special occasions of the different professions).

12. Etiology and treatment of puerperal paralysis.

According to the programme, the questions of the first section shall be treated in general meetings. The other two at the meetings of the sections.

The order of the subjects as given above can be considered as definite. Reporters will be appointed soon.

* * *

The Congress will no doubt require many days to do justice to such a loaded programme, and it is to be hoped that the attendance will be as large as the importance of the questions presented demands.

* * *

I am pleased to acknowledge the receipt of a check for twenty-five dollars from the Massachusetts Veterinary Association, which has been forwarded to the Treasurer of the Nocard Monument Committee, receipt for which will be returned as soon as received. A. L.

THE ETIOLOGY OF AZOTURIA.

The two cases of this disease reported in the January REVIEW, because of the peculiarity of the condition of the patients at the time of the attacks, together with the editorial remarks in

the same issue bearing upon the unsettled condition of professional opinion in regard to the causative agent and the pathology of the disease, have already stimulated one of our readers to express his opinion upon the subject, which was the chief object of the agitation given to it at that time. Dr. George E. Corwin, Jr., of Lakeville, Conn., contributes to the present number an inquiry into the factors operating in the system to produce the disease, which opens up a new line of thought, more suggestive than assertive, yet as positive as practical in the absence of all definite bacteriological and chemical data.

We commend his article cordially to our readers, and suggest that other veterinarians follow his example. All city practitioners, at least, come into frequent contact with this often fatal disorder, and as it usually attacks the most valuable animals in the stables of their best clients, it would seem that every effort should be put forth to concentrate our knowledge and clinical experience into something more tangible and reasonable than exists at present.

As an incentive, we have but to look at that disease of milk cows which was our bane but a few years ago—parturient apoplexy. Although the exact mode of infection in that disease is not clearly demonstrated, we are certainly in possession of a better understanding of it than before the announcement of Schmidt's views. We no longer hear theories of the full-blooded dam, forced to provide blood for both her own nutrition and that of the fœtus, being suddenly deprived of one abstracting source through the removal of the young, and being the host of a superabundance of rich blood, falls a victim to the inevitable consequence, cerebral congestion. This theory held sway for many years, and, being reasonable and logical, was seldom the subject of dispute. Efforts to overcome the engorged condition of the brain were most heroic, and included phlebotomy, drastic purgation, counter-irritation, derivatives, etc., but the results were more disastrous than they would have been had the patient been left to the care of nature. The direction of attention to the mammary gland as the point of infection, the resultant in-

toxication being due to the poison generated in the lactiferous ducts and cæcal vesicles, brought with it a line of treatment so much superior to all other methods, that it can now be said that no veterinarian worthy of his calling will omit the injection of germ-destroying substances into the udder. While Schmidt's method may not be so effective as others subsequently introduced, the principles are the same, and he will ever be regarded as the man who suggested the true and rational line of therapy.

There are some analogies between azoturia and parturient apoplexy—the high condition of each, the suddenness of the attacks, the presence of abdominal pain, the cerebral complications, the paralysis of the posterior extremities and the abdominal and pelvic viscera. Of course in the former disease there is no parturient factor, and it may be that in the latter disease lacteal activity may only open up an avenue for the development of a similar process which is produced by the short period of idleness of the azoturic soliped. There are certainly no other two diseases affecting these two species of domestic animals bearing so many points of resemblance, and yet so totally dissimilar in nature and causation, as laid down by accepted authorities. That they are each an auto-intoxication, there can be little doubt. If the profession has reduced the mortality in the one by more than 50 per cent., are we rash in hoping and believing that we will yet be enabled to successfully cope with the other?

The Veterinary Medical Association of New Jersey, at its annual meeting at Trenton, Jan. 14th, did a very graceful thing in electing to honorary membership, George W. F. Gaunt, of Mullica Hill, N. J., Master of the State Grange of New Jersey. This is a well deserved honor to a progressive and worthy man. Mr. Gaunt, with his influential organization, stood beside President William Herbert Lowe in 1902 in his strenuous and successful efforts in placing a law upon the statute books of New Jersey which was at once dignifying and elevating to the

veterinary profession, a protection to the horse owner, farmer and others from veterinary charlatanism and consequent loss, and their animals from unnecessary suffering; at the same time safeguarding the public health of the human population from diseases communicable from animal to man. We congratulate Mr. Gaunt and we congratulate the Veterinary Medical Association of New Jersey.

AN INTERESTING ITEM will be found in "French Review" this month respecting the cause and treatment of that common affection of horses, periodic ophthalmia. An investigator has proven its microbian nature, having reproduced the disease in rabbits and horses by inoculating them with a culture grown from a section of the iris of an affected horse, and has successfully treated it by local and constitutional medication with potassium iodide. This discovery may explain the good results recorded in the REVIEW a few years ago by the injection of tincture of iodine through the orbital foramen. Some practitioners who tried this method experienced much difficulty in passing the needle through this small opening, and made the injections into the orbital cavity at the margins of the ocular globe.

THE DIRECTORY of "Veterinary Medical Association Meetings" which was instituted by the REVIEW a few months ago has met with great success. At its inauguration there was very little data in regard to the associations, but Secretaries were asked to supply the absent information. We have been greatly pleased with their response, as there is scarcely a missing detail in the entire long list. It is certainly a convenient and valuable directory, and must be of considerable benefit to the associations and to the veterinary public. We invite all readers to suggest any improvements or new features which will make the REVIEW of greater service to the profession.

ORIGINAL ARTICLES.

ROBERT KOCH AND HIS CRITICS.

A STUDY IN THE CONTROVERSY OVER INTERCOMMUNICABILITY OF TUBERCULOSIS.

By D. Arthur Hughes, Ph. D., D. V. M., New York State Veterinary College, Cornell University; Government Inspector, East St. Louis, Ill.

(*Concluded from page 943.*)

S. Monckton Copeman.

In an address as alarming as Koch's, professional men were not slow on reflection to see all its faults; and the mark of haste and inconsideration was pointed out in an important omission which Koch made when he forgot to mention the intestinal lesions in the pigs upon which he experimented. Dr. S. Monckton Copeman wrote to the *Lancet:* "In his (Koch's) statements on his experimental feeding of swine with bovine tuberculosis he says: 'The animals (pigs) which had eaten bacilli of bovine tuberculosis had, without exception . . . tuberculous infiltration of the greatly enlarged lymphatic glands of the neck and of the mesenteric glands and also tuberculosis of the lungs and spleen.' But, although the swine had been infected by the method of feeding, no mention is made as to whether tuberculous lesions of the intestine were found in any of the experimental animals. The omission appears to be the more remarkable, seeing that in discussing the reasons for his assumption that bovine tuberculosis cannot be conveyed to man by milk or butter containing 'living and perfectly verile bacilli,' that it is only when the intestine suffers first' that a case of tuberculosis can be assumed with certainty to have been 'caused by alimenta.'"[*]

[*] *Lancet*, 1901. P. 316. Aug. 3, 1901.

G. H. Masson.

Even from an extreme part of the British Empire, from Port of Spain, Trinidad, came a criticism which points to a lack of care in statement, and possibly an error in method. Whether the argument is valid or invalid remains for the future. Dr. Masson wrote . . . . I was struck by the fact that no mention was made by Koch of the physical condition of the cattle experimented upon beyond the statement that according to the tuberculin test they were free from tuberculosis. As it is usual, however, to select only perfectly sound cattle for such experimental purposes, it may be safely assumed in the absence of any contrary statement, that the nineteen young cattle referred to by the Professor came under this description. . . . . If bovine tubercle is distinct from human tubercle, the fact that healthy cattle inoculated with bovine tuberculosis readily exhibit signs of tuberculosis is no reason why healthy cattle inoculated with human tuberculosis under similar conditions should become tuberculous, for neither do healthy human beings necessarily acquire tuberculosis after the entrance of living tubercle bacilli into their systems. . . . . Some previous weakening of a particular organ, or of the whole system, is as a rule required. Moreover, the infection takes place with greater ease at certain age periods. In old age man is rarely infected with tuberculosis, which goes to show that, though his race is susceptible to the infection, certain other physical conditions beyond the mere entrance of tubercle bacilli into his system are necessary for that infection to take place.

In order therefore to prove the susceptibility or non-susceptibility of cattle to human tuberculosis, the animals experimented upon should be such as are in a state of health similar to that in which man is known to be infected. They should be debilitated, ill-conditioned beasts, proved, nevertheless, to be free from tuberculosis by the tuberculin test—weak animals in a state of physiological depression—as after giving birth to young and so on. Such animals would fulfil the necessary conditions better than sound ones, and failure to succeed in inocu-

lating them with human tabercle bacilli would, I venture to believe, be more conclusive evidence in favor of Koch's theory than the results of experiments carried out on healthy cattle only.*

(D) IN CANADA AND THE UNITED STATES.

J. George Adami.

Much of the very best work on the inter-relation of bovine and human tuberculosis—(I had almost said with Leonard Pearson, of the University of Pennsylvania, *the* best work)—has been done during the last ten years in Canada and the United States. When one remembers men like Adami and Smith, Ravenel, Frothingham, Dinwiddie, one's heart beats with honest pride at North American achievement. The questions of live-stock interests and their relation to the export trade and to public health at home and abroad have resulted in a zest for study of animal diseases. Noteworthy experiments, indeed, had led to important discoveries. European authorities, like Hüppe among the Germans, Nocard among the French, the celebrated Koch himself, refer to American authority on bovine and human tuberculosis. While North American articles are printed in toto, or quoted, in the great British medical journals, and that without condescension or mere deference. It is therefore with pleasure that I now turn to recent Canadian and American views on the question of intercommunicability.

Professor J. George Adami, of McGill University, has published an article "On the Relationship between Human and Bovine Tuberculosis," evidently from its tone and content incited by Koch's declarations of the previous year, printed in the *Philadelphia Medical Journal* Feb. 22, 1902.† It is a portion of the annual report of the author to the Department of Agriculture of the Dominion of Canada for the year 1901. Scrupulosity seems to be almost a religion with Adami, as is shown in the way he measures his words. There is in the article a calmness and fairness of mind, a care in statement, combined with an amplitude of knowledge of all that has been done on the disease, that

* *Brit. Med. Journ.* II, 1901. P. 835. Sept. 21, 1901.

† Pp. 356-365.

makes the paper truly admirable. The article is elaborate and the conclusions, as follows, are probably meant to be compendious: (1) Bovine tuberculosis is easily coveyed from cattle to cattle by inhalation, milk (in calves), stalls, drinking places, etc. (2) Human tuberculosis is transmissible to cattle. Pure cultures of these bacilli rarely cause infection. Mixtures of tubercle bacilli with other microörganisms (as in sputa) appear to be more infectious. The difficulty in inducing artificial tuberculosis favors the idea that natural infection of cattle with human bacilli must be of singularly rare occurrence. (3) Swine appear to be fairly easily infected with both human and bovine tuberculosis, and when infected with the former these gain an increased virulence for guinea-pigs and rabbits. But while through the use of infected milk these animals become frequently infected from cattle, conditions favoring the reverse process are rare. Thus, while it may occasionally be that swine, or possibly other domestic animals, act as intermediaries in the passage of tuberculosis from human beings to animals, the conditions favoring such transmission from man to hog, or from hog to cattle, so rarely show themselves, that again, for practical purposes, this mode of infection may be neglected. (4) If this be so, it should be possible to eradicate bovine tuberculosis in a region in which human tuberculosis continues to be widespread. (5) Human tuberculosis in the majority of cases is conveyed from human being to human being by inhalation, more rarely is conveyed through the alimentary tract, still more rarely through the genital tract, through surface wounds, and from the mother to the fœtus during intra-uterine life. (6) Everything points to the fact that in the main the bacilli causing infection in man are derived from previous cases of the disease in man. (7) By sojourn in the human body and passage from man to man the human tubercle bacilli have acquired properties differing from those acquired by bacilli which have passed through cattle; their shape differs, the rate of growth and the appearance of the growths outside the body are different; their virulence towards animals of the laboratory is also different. (8) The dif-

ferences, however, are not sufficiently marked or constant enough to permit us to conclude that we are dealing with distinct species. On the contrary, the evidence at our disposal points clearly to the fact that in the different species of animals we encounter at most, *races* of tubercle bacilli which by growth in the bodies of animals of another species take on the characteristics of the race of bacilli peculiar to that species. (9) Bovine tubercle bacilli can be transmitted to man, and this either through wounds or through the digestive tract. (10) By passage through cattle the tubercle bacilli gains increased virulence for cattle, rabbits and guinea-pigs, but lessened virulence for man and (it would seem also) for carnivorous animals. (11) Save in the very rare cases of wound infection, there is a significant lack of evidence that bovine tuberculosis infects *adult* human beings. (12) It is infants and those of early age who are liable to be infected by the tubercle bacilli of bovine origin, and this through the agency of milk. The statistics bearing upon the continued frequency of tuberculosis in children and upon the relative frequency of intestinal and abdominal tuberculosis in children must be accepted as conclusive evidence upon this point. (13) Even with children a consideration of the great frequency of bovine tuberculosis in certain regions, and of the absence of any record affecting those supplied from a given "milk round" leads to the conclusion that the bovine bacilli have not heightened virulence. (14) The few positive records we possess of direct transmission of tuberculosis from cattle to man through the agency of milk, indicate that infection is brought about only by the employment of milk from cattle which are very extensively diseased, more especially those suffering from udder disease. In other words, large numbers of tubercle bacilli are required in order to infect human beings with tuberculosis of bovine origin. This again is an indication that the bacilli cannot be regarded as having gained a heightened virulence for man, and that infection is not very readily communicated. (15) Animals showing physical signs of tuberculosis (for mild grades of the disease show no physical signs),

and above all, those exhibiting udder tuberculosis, should therefore be condemned and under no condition should their milk be used for food. (16) Where there is tuberculosis in a herd, Bang's method should be employed, the animals reacting to tuberculin being separated from the healthy ones; the milk from the reacting ones, from whatever purpose used, should be Pasteurized so as to effectively destroy the tubercle bacilli. (17) The great cause of infantile mortality is inflammation of the stomach and intestines, and this is proved to be mainly brought about by the use of badly kept and fermented milk. Pasteurization of milk therefore and prohibition of milk from tuberculous udders will lessen mortality from tuberculosis among children.

M. P. Ravenel.

Dr. M. P. Ravenel, of the University of Pennsylvania, is among the most ardent workers on intercommunicability. He has written at least five remarkable papers within the last two years on the subject. His articles in every paragraph bear the stamp of authority. He proceeds with caution and treats every turn and phase of the subject exhaustively. The address of Koch was spice to his further endeavors, and his recent studies have but strengthened his convictions on the communicability of bovine tuberculosis to man. In his most recent paper delivered before the Pathological Society of Philadelphia * he says: "It is certain that the various types of tubercle bacillus known to us have sprung from a stock common to them all, and that they have acquired their racial peculiarities by residence in different animals through which they are subjected to a difference in food, temperature and resistance. In other words the struggle for life is carried on in the various species of animals under varying conditions, the results being that in each animal the tubercle bacillus acquires properties which best enable it to carry on life in that particular host. The acquisition of these peculiarities no doubt requires a certain lapse of time, but how much we do not know. We have experimental evidence that

* *U. of Penn. Med. Bulletin*, May, 1902.

it does not require a great time to change the tubercle bacillus from a higher to a lower type. By the method of inoculation into the peritoneal cavity in collodion sacs, Nocard has shown that in from five to eight months both the bovine and human bacillus can be made to acquire the cultural characteristics of the avian bacillus, and to a certain extent its pathogenic action also. A few passages from fowl to fowl during four to six months increases this greatly. By passage through the blind-worm Moller has in the course of a year so changed the human tubercle bacillus that it grows like the organism of fish tuberculosis, and has the same temperature reactions. It grows best at 20° C. and ceases to grow entirely at 30° C. . . . . With these facts before us I do not think we are forcing a point in believing that it is at least possible for the bovine bacillus to become rapidly so changed in the body of man that it will show the cultural and pathogenic peculiarities which we find usually in cultures of human origin. . . . . The evidence at hand forces us to conclude that human and bovine tuberculosis are but slightly different manifestations of one and the same disease, and that they are intercommunicable. We are not in a position at present to define positively the extent of the danger, but that it really exists cannot be denied. In the past there has probably been a tendency to exaggeration, but however great this may have been it does not now justify any attempt at belittling the risk and it is folly to blind ourselves to it."

T. Smith.

Since Theobald Smith's famous monograph of 1898 he has indited nothing probably on the relation between human and bovine tuberculosis which he would wish to have quoted on the transference of the diseases. Yet, before the American Academy of Medicine in New York, Dec. 1901,* he made a speech on the difference between the two diseases, in which he gave the gist of his well-known argument. His conclusions should be cited: "(1) There was no evidence that bovine tubercle bacilli might indiscriminately affect the human subject; (2) that

* *Medical Record*, 34 and 35, 1901. Dec. 19, 20, 1901.

there *was* some evidence that bovine bacilli had been isolated from human subjects, but that the successful transfer was uncommon and depended upon certain conditions requiring further careful research. In acknowledging "that there was some evidence that bovine bacilli had been isolated from human subjects" Smith admits more than Koch. It is likely that Smith refers to tuberculous verrucosity of the cutis which many times has been shown to possibly have a bovine origin. The latest cases of the kind in America are brought forward by Ravenel.

D. E. Salmon.

The Chief of the Bureau of Animal Industry of the United States from conviction has been a staunch opposer of Koch. In a paper written lately on "Recent Investigations Concerning the Relation of Human and Bovine Tuberculosis," * after reviewing the work of de Jong, Ravenel and Arloing, says: "The frequency with which man is infected with animal tuberculosis cannot be determined by the data now available, and the investigation of the question is surrounded by many difficulties. It has been made clear that we have no right to demand a primary lesion in the intestine as a criterion of ingestion tuberculosis. In experimental animals fed on tuberculous material the oldest lesions are frequently found in the glands of the head and neck, or even in the bronchial glands or lungs. While tubercle bacilli may pass through the stomach and penetrate the intestinal wall, this apparently is not the most common channel of infection from the food. There are some authors who believe that even in inhalation tuberculosis the bacilli enter the tissues by the naso-pharynx or pharynx; and probably also the naso-pharynx is as easily contaminated by infected food as by inhaled bacilli. It is difficult therefore to see how we can expect anything in the distribution of the lesions which will enable us to distinguish between ingestion and inhalation tuberculosis. Probably the isolation of the bacillus from the lesions in man and the determination of their virulence will give some idea as to the frequency of bovine infection, but we must expect

* *Jour. Amer. Med. Assoc.*, Dec. 20, 1902. Pp. 1571–1574.

in many cases that the bacilli will be modified to such an extent that the source can no longer be determined. It would appear from the researches of Dubard, Nocard and Ravenel that the bovine bacillus may in some cases, when passed through other animals or man, retain its characteristics, and in others may lose them. Recently, Salmon asked Schroeder at Washington to infect a cow's udder with human bacilli, the idea being to find out whether they could multiply in this situation and increase in virulence. They decreased very much in virulence up to the fourth or fifth month. At six months they slightly gained in virulence. The udder at the quarters inoculated became indurated and a thick creamy pus was performed. These experiments showed the instability of the human bacillus in the bovine animal."

R. R. Dinwiddie.

Among the original investigators in the field of bovine tuberculosis, the name of R. R. Dinwiddie is prominent. Indeed, he has been bracketed with Smith and Frothingham and Ravenel as among the best workers in the past decade. When an article with his signature appears following the address of Koch, his opinions are to be listened to with attention. In a recent paper printed at the close of 1902 he says: * "Articles have appeared reviewing the evidence as to the frequency or possibility of human tuberculosis originating by contagion from cattle. Such evidence that we obtain must necessarily be circumstantial. Even if it were permissible to make direct inoculation or infection experiments on the human being, the settlement of the question would only be observed by a series of comparative tests on many individuals with material of human and bovine origin respectively, and accompanied by all the safeguards of exact experimentation which have been found necessary in similar tests with cattle. . . . . It cannot be said that the facts . . . . remove the question (of transmissibility of bovine and human tuberculosis) in any degree out of the domain of speculation.

* *Jour. Amer. Med. Assoc.*, 1902, 1574–1577.

They really furnish mere food for theorizing, and may either diminish or increase our suspicion of dairy products according to the process of reasoning employed. It may be argued, for instance, since bovine tubercle bacilli have been shown to be equally as virulent as those of human origin for all animals tested and more virulent for some, the presumption is that they are more virulent for mankind also. Contrariwise, it may be said that human tubercle bacilli being shown to be less adapted for growth in cattle than the bacilli of bovine origin, there is reason for believing that the converse may also be true. . . . . If the bovine bacillus be regarded as merely a more highly virulent modification of the human variety, this should be shown by the greater gravity of the lesions produced by comparative inoculation experiments on all species of susceptible animals. If, however, there is a selective feature shown by such inoculations, the excess of virulence of the bovine variety being manifested only towards certain species of animals, some support would be gained for the theory of a distinction of races other than that founded on a mere difference in degree of pathogenic activity. The tests necessary to determine this latter point have since been made, and the records are contained in my second report on tuberculosis, 1900. The bovine tubercle bacillus has been shown by these experiments, to possess an indiscriminate and not a selective excess of virulence over the human specimen. Similar results have been obtained by Pearson and Ravenel of Philadelphia and Koch and Schütz of Berlin. In a purely speculative question it is a matter of every-day experience that the same data may lead to entirely different deductions. Prof. Koch . . . . has deduced the inferences, largely, as we infer, from his experimental work on animals, that bovine tuberculosis may constitute no factor in the initiation of tuberculosis of man. Few of us, I think, will be able to follow this process of reasoning. Whether or not his view is correct, it can hardly be said that he derives any support from the purely experimental evidence. I think there is a wide field of investigation yet to be covered before we, as sanitarians, can feel justified

in discontinuance of those safeguards against infection from tuberculous dairy products which an unwilling public are just beginning to appreciate."

The words of Dinwiddie close our section on the first results of Koch's address—the loud acclaim against him and the warm discussion by his contemporaries at home and abroad of his recent opinion. Even the casual reader of the various opinions expressed will be struck with the curious commingling of fact and theory in the opinions of all. But it is theory which makes for fact. The theory of to-day is the demonstrated fact of to-morrow. Not a single person who has written goes the length of defending Koch in his various dicta. The discussion, though here and there is partial agreement with him, is really a babel against him. Many of the tenets propounded by the different scientists in this argument must be examined by future investigators, demonstrated as truth, *i. e.*, scientific knowledge, or cast aside as merely curious theory. That speculation is rife on this great question of intercommunicability no one will deny. What will be the outcome in the future, who will say?

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PART II.

THE MOST RECENT VIEWS OF KOCH AND HIS CRITICS. A SUMMARY OF THE STATUS OF THOUGHT TO-DAY ON THE QUESTION OF INTERCOMMUNICABILITY OF TUBERCULOSIS.

(1.) *The International Tuberculosis Congress, 1902, in Berlin.*

(a) THE OPINIONS OF KÖHLER, PRESIDENT OF THE CONGRESS. (*Recueil de Méd. Vétér.*, 15 Nov., 1902, pp. 700-702, and *Deutsche Med. Woch.*, XXVIII, 801, 6 Nov., 1902).

It seems fitting, in view of the multitude of questions, all more or less connected with the several doctrines of communicability or intercommunicability, which have arisen during 1901 and 1902, that we give a sketch of what occurred at the Tuberculosis

Congress at Berlin, October, 1902. Here it would be that Koch might be expected at last to answer his critics. For nearly a year and a half his speech had stirred up endless investigation and no little vituperative criticism. Koch now, the more that the Congress was to meet in the capital of the German Empire and in the city in which he is professor, found his occasion to give all a dignified answer.

The President of the Congress, Köhler of Berlin, gave an introductory address ("Ueber den Stand der Frage von der Uebertragbarkeit der Rindertuberkulose auf den Menchen"—state of the question of the transmission of bovine tuberculosis to man), in which he said that it was his opinion that the only conclusion they could reach at present on this question was—that they could not affirm with any positiveness whether human and bovine were similar and identical diseases or entirely dissimilar. They could not determine this from statistics, nor experiences, nor in any other sense. The indications were that they would have to maintain sanitary measures against the beef-animals and that they should not even be modified, as they were unable to demonstrate whether bovine tuberculosis could or could not be transmitted to man. He did not speak of the work of the Imperial Sanitary Institute. Its experiments were not yet completed.

(b) *Statements of Nocard, Hüppe, Bang and von Baumgarten, et al.*

Köhler was quickly followed by other speakers. Nocard stated that not only should the actual existing measures be maintained, but that there should be greater application of their severity. He spoke about the recent experiences of de Jong, Thomassen, Max Wolff, Orth, Jensen and Fiberger who were all able to inoculate human tuberculosis to animals, of the statistics of Still and Heller, relative to the frequency of intestinal tuberculosis in children and of the very great virulence of the tubercle bacilli of bovines for man as it had been established by different authors.* Arloing of Lyons maintained that there was

*For Nocard vid. *Recueil de Méd. Vétér.*, 15 Nov., 1902.

a difference in pathogenic activity of human as well as of bovine tuberculosis. There exists a certain rise of virulence beginning with the slightly virulent human bacillus and extending upward to more virulent human bacilli or bovine bacilli to the most virulent form of *perl-sucht*. With certain cultures of human bacilli he was able to produce extensive tuberculous lesions in calves.* Hüppe and Bang took much the same view. Bang reported a number of experimental inoculations of human tuberculosis into the anterior chamber of the eye of calves—formation of minute nodules on the iris. Orth stated that he had produced peritoneal tuberculosis together with tuberculosis of the lymph glands lying within the path of the lymphatics, *i. e.*, an inoculation intra-peritoneally in a calf and goat by virus from a rabbit which had been tuberculized by direct injection of human sputum.

Von Baumgarten,† who, now that Virchow is dead, perhaps, except Koch, knows more about experimental tuberculosis than any man in Germany, spoke somewhat significantly as follows: 1. All experiments which had been made up to the present time and intended to disprove Koch's statements would not stand, as they had been made in an objectionable manner. 2. In order to settle the question, (a) inoculation should be only subcutaneous; (b) the number of bacilli should be limited. These things would show whether infection takes place at the point of inoculation and extends to the system by the blood or lymph. 3. Intravenous injections are entirely useless to the purpose, because from dead bacilli a disease similar to tuberculosis would be set up and produce death due to foreign body emboli. Concluding, he said he had in this manner experimented with human tuberculosis in calves at Tübingen, with negative results.

(c) *Koch's rejoinder—analysis of his speech, his conclusions and suggestions.*

Koch's rejoinder.—As Koch's address of July 27, 1901, had

* For Arbeiten vid. von Baumgarten's article, *Jour. of Tuber.*, Jan., 1903.

† *Jour. of Tuberculosis*, Jan., 1903.

proved so effective in stirring up the International Tuberculosis Congress in London, and as it had been followed by such exertion afterwards on the part of investigators and publicists, one would expect that his speech at the next Congress, this time held in Berlin, would arouse even more attention, and would be followed by much comment and anxious criticism. As a matter of fact, we heard little of it from the newspapers: it was printed as a matter of course, but caused no eruption among the critical. The fact is its spirit, its completeness in kind, the lofty disdain of churlishness which animates it silences the carping and gives at its close the finality of authority. There is no doubt now of Koch's sincerity: he does not appear in this new address a perch-proud savant, but a quiet, even humble discoverer. Koch's last words are suggestions, as from an elder brother. Object as we may, we know that his judgment is sound and should be followed. If his speech of 1901 was reckless and ill-considered, that of 1902 is calm, poised, indubitable.

Analysis of his speech.—The speech is easily divisable into five parts: First, an answer to those who have criticised his views on primary intestinal tuberculosis; second, his exposition of the fallacy in the argument that tuberculosis verrucosa cutis is the dangerous encroachment of bovine tuberculosis upon man; third, why we should not fear infection from meat; fourth, why we should not fear infection from milk; fifth, Koch's advice to the Congress and scientists in general at the present juncture. If we take up the first part, viz., his answer to those who have criticised his views on primary intestinal tuberculosis, on this his main thoughts are: The statistics hitherto collected regarding primary intestinal tuberculosis are too uncertain, and beset with too many contradictions to justify one in accepting them as decisive evidence. In Great Britain the recent statistics of Woodhead, Still and Shennan are contradicted by those of Carr and Coutt in the *British Medical Journal* of the same year, 1901. In America, as Bovaird says, the disease is little known. All German authors agree that it is rare in Germany. Besides there is no general agreement among phy-

sicians and pathologists what primary intestinal tuberculosis is.

Now the second point: Koch's exposition of the fallacy in the argument that tuberculosis verrucosa cutis is the dangerous encroachment of bovine tuberculosis on man. He says the recorded observations of the infection of the skin among butchers and their ilk are most contradictory. Such infections, if we must call them infections, run the course of unimportant local skin diseases and heal of themselves. . . . . It must be perfectly evident that in all attempts to solve the question of the transmission of bovine tuberculosis to man by means of statistics relating to primary intestinal tuberculosis, and through observations on skin infection in man, we are dealing only with indirect evidence. In the most favorable cases included in such statistics we may know that they were genuine cases of primary intestinal tuberculosis, but we do not know for certain that they were caused by infection from bovine tuberculosis, rather than from human tuberculosis, although in every case the latter possibility must be taken into account in view of the extraordinary wide distribution of the disease in the human subject. Thirdly, why we should not fear infection from meat. If infection through the use of tuberculous meat (or milk) were as common as it is asserted to be, cases of the kind could not escape direct observation. . . . . A certain number of human beings, or per cent. of human beings, who had partaken of the infected article of diet must become ill and the case must occur in groups. There has not been recorded anywhere a single instance of the simultaneous infection of a number of individuals in consequence of their having eaten meat in this manner. Besides the Congresses of 1885, 1891, 1895, 1898 and 1901 were unanimously against the total condemnation of carcasses. Fourthly, why we should not fear infection from milk. Koch admits there are on record reputed cases of infection in groups from milk. But he takes up each account and shows where each is insufficient and probably fallacious in reasoning. There are, too, 28 cases on record where patients are reputed to have been attacked singly. No confidence can be placed in these cases as being convincing.

Koch's Conclusions.—(1) Positive proof that the disease was really tuberculosis must be furnished; if possible, the starting point of the disease must be established. To this end we must have in the case of adults indisputable clinical symptoms, or, when they are not present, a post-mortem examination. In the case of children a post-mortem is indispensable, as in them the clinical symptoms are less certain. (2) Other sources of infection must with certainty be excluded. The assurance that the patient comes of a healthy family will not in any circumstance suffice. There are too many other possibilities of infection, both in the family and outside of it, which in the case of every human being must be taken into consideration. . . . . We would refer, for example, to the recent investigations of Preisich and Dieudouné with regard to the very noteworthy source of infection in children in the shape of tubercle bacilli in the dirt of the finger nails. (3) In every case of alleged infection through the use of tuberculous milk the history of all the other persons who have partaken of the milk must be taken into consideration. These other persons form, so to speak, a control experiment; and when, out of a large number of people who have partaken of the suspected milk at the same time, only one becomes ill, this fact speaks decidedly against the supposition that that one person was infected by the common article of diet. Even in the case of typhoid, any suspicion attaching to the milk would immediately be dismissed if it were found that out of all the persons who had partaken of the milk, only one had suffered from typhoid. (4) The source of milk must also receive attention. Seeing that in recent years it has become increasingly clear that the milk of tuberculous cows does not contain tubercle bacilli unless the udder is involved in the disease, we can no longer accept the fact that a person has consumed milk from a tuberculous cow as proof that bovine bacilli have actually gained access to his alimentary canal. It may well happen that a person consumes tuberculous milk without being brought into contact with bovine tubercle bacilli. The milk must be from a cow with a tuberculous udder, and the fact must be noted in

any report regarding milk infection which pretends to be complete.

Koch's Suggestions.—At the close of his 1901 speech Koch spoke rather slightingly of the possibility of infection from milk, and, in closing, laid weight on sputa as the only source of infection which counted. At the close of the 1902 speech after this labored argument in which he gives much space to the question of milk infection, we find him closing in a plea to the Congress that :

(1.) In cases of alleged infection through the use of tuberculous milk, attention be paid to the conditions already laid down—post-mortem examination, exclusion of other sources of infection, history of other persons who partook of the milk, proof that the udder was tuberculous. And :

(2.) In cases in which infection does not occur after the use of tuberculous milk, again a study should be made under the specified conditions—proof that the udder was tuberculous, observation of the persons for a sufficient time, information whether the milk was boiled.

(2.) *A summary of the status of thought to-day on the question of intercommunicability of tuberculosis.*

No one who has followed closely with me in this study of the question of intercommunicability (for all that I have yet written touches more or less this question) will not, on reflection, see a great difference in Koch's speech of 1902 over that in 1901. We find in his last speech no references to inconclusive experiments, a trifle less dogmatic assurance that he is right, a mind made somewhat more open and perhaps more frank than it was before. It seems likely that Koch did not anticipate that fierce criticism which he met at his preceding [illegible] appearance. Instead of taking the position that sputa [illegible] tuberculous patients was the only thing to be reckoned with, he now is willing to allow that the question of possible infection through at least milk products, is matter for serious investigation. And this brings us to our own conclusions :

1. There is no unanimity on the part of scientists at present:

   (a) In what manner and in what degree human tuberculosis may be transmitted to cattle.

   Neither question has been demonstrated beyond controversy.

   (b) Nor in what manner and in what degree bovine tuberculosis may be transmitted to man.

   Neither question has been demonstrated beyond controversy.

2. Since Koch's statements of July 27, 1901, if not before, scientists have been passing through a period of disputation over the question initiated by Theobald Smith and American scientists, but made to stand out strongly before the scientific world by Koch—that of the identity or non-identity of the bacillus of *perl-sucht* and that of human tuberculosis in structural character, in morphology and pathogenicity.

   There is no conjuncture of opinion on this question.

3. Most scientists agree that milk or meat products may be, and sometimes are, vehicles for transmission of tuberculosis to man. It is now believed that the amount of danger to human-kind from this source was greatly exaggerated up to the time of Koch's statements in 1901; but that he, in his famous address, on the other hand, greatly belittled this danger.

4. All agree that bovine tuberculosis is a danger and a menace to most, if not all, domesticated animals—including now, according to recent experiments, the horse, ass and monkey. All believe that, on the score of animal economy and for animal preservation and health, sanitary laws should be stringent against it.

5. We are in the morning of an important scientific period of investigation upon the subject of transmissibility. The discussion which has been rife for two years has reopened all questions which pertain to transmissibility

and the dangers which might ensue from transmission. Tuberculosis is so perilous and devouring that men are goaded to gauge this question of inter-relation and intercommunicability.

6. In the near future, we, as scientists, must settle these absorbing topics:
   (a) In what manner and in what degree human tuberculosis is transmitted, if at all, to cattle?
   (b) In what manner and in what degree, bovine tuberculosis is, if at all, transmitted to man?
7. The first question—that of transmission of human tuberculosis to cattle, to obtain the unanimity of scientists, will have to receive the conclusiveness of demonstration after the most extensive experiments upon large animals—particularly bovines and other animals whose meat or milk products are used for food.
8. The second question—that of transmission of bovine tuberculosis to man—if there is to be unanimity of opinion, will have to be settled by expert study of statistics made and collected in the best manner known to statistical science. Such data, whether it incriminate either meat or milk products as the vehicles of the dread disease tuberculosis, must, to be valuable, conform to some such rules as those laid down by Koch: data of a strict and minute post-mortem examination; exclusion of other sources of infection; history of other persons who partook of the same milk or meat.

It is easy to pass from the stern exactness of the scientist into the shadowy land of fancy. Men too often of late have departed from facts as they could have obtained them in gross and microscopic abnormal anatomy to fanciful by-paths of their own making, where they become lost in argument and bewilderment. As scientists, we must face the questions set for us. We must settle these questions or come to unanimity upon them. Then, and only then, can we as sanitarians fight with best effect against tuberculosis.

MENINGITIS IN HORSES, CATTLE, SHEEP AND SWINE.*

By Louis B. Wilson, M. D., First Assistant Bacteriologist, and S. D. Brimhall, V. M. D., Director Veterinary Department.

(*Concluded from page* 960.)

Experimental horse No. 12, a large, old, thin, but healthy horse, was placed in a box stall at the Research Laboratory of the board and given ensilage as follows:

Jan. 30, 1903, began feeding on good ensilage. No other feed was allowed. Horse at first refused ensilage, but later ate it sparingly. After two sacks of the good ensilage had been given the decomposed ensilage was substituted on February 5. One sack of this had been eaten by the horse by February 9. The animal at this time, however, had lost so much flesh that he was again placed on the better ensilage and a little corn was added to it. The ensilage and grain were made into a mash part of the time and part of the time the ensilage was fed by itself in a moist condition. The animal was kept on this feed until March 13, or forty-three days in all. During this time his temperature was taken twice daily, as follows:

1903.			1903.			1903.		
Date.			Date.			Date.		
Jan.	Hour.	Temp.	Feb.	Hour.	Temp.	March.	Hour.	Temp.
30.	5:15 p. m.	100	19.	5:00 p. m.	100.2	8.	9:00 a. m.	98.2
31.	9:00 a. m.	99.8	20.	9:00 a. m.	100.4	8.	5:00 p. m.	98.8
Feb.			20.	5:00 p. m.	100.2	9.	9:00 a. m.	98.4
1.	11:00 a. m.	100	21.	9:00 a. m.	100	9.	5:00 p. m.	98.2
2.	10:00 a. m.	99.4	21.	5:00 p. m	100.2	10	9:00 a. m.	98.2
2.	4:30 p. m.	99.6	22.	9:00 a. m.	100.4	10.	5:00 p. m.	98.8
3.	9:00 a. m.	99.1	22.	5:00 p m.	99.4	11.	9:00 a. m.	98.4
3.	4:00 p. m.	100	23.	9:00 a m.	99.2	11.	5:00 p. m.	98.2
4.	9:00 a. m.	100.4	23.	5:00 p. m.	99.2	12.	9:00 a. m.	98.4
4.	5:00 p. m.	100	24.	9:00 a. m.	99	12.	5:00 p. m.	98.4
5.	11:15 a. m.	99.6	24.	5:00 p m.	99.2	13.	9:00 a. m.	98.2
5.	5:30 p. m.	100.2	25.	9:00 a. m	98.8	13.	5:00 p. m.	98.2
6.	9:00 a m.	98.8	25.	5:00 p. m.	98.6	14.	9:00 a m.	98.4
6.	5:00 p. m.	99.4	26.	9.00 a. m.	98.8	15.	10:00 a m.	98.6
7.	11:00 a. m.	98.9	26.	5:00 p m.	98.4	15.	5:00 p. m.	98.4
7.	5:00 p m.	99.4	27.	9:00 a. m.	99	16.	9:00 a. m.	98.6
8.	10:25 a. m.	99.4	27.	5:00 p. m.	98.6	16.	5:00 p m.	98.2

* From the Nineteenth Report of the Minnesota State Board of Health.

1903. Date. Feb.	Hour.	Temp.	1903. Date. Feb.	Hour.	Temp.	1903. Date. March.	Hour.	Temp.
9.	10:30 a. m.	99	28.	9:05 a. m.	98.6	17.	9:00 a. m.	98.8
9.	4:30 p. m.	99.4	28.	5:00 p. m.	98.8	17.	5:00 p, m.	98.4
10.	9:00 a. m.	99.6	March.			18.	9:00 a. m.	98.6
10.	4:30 p. m.	98.6	1.	9:15 a. m.	98 4	18.	5:00 p. m.	98.4
11.	10:30 a. m	98.6	1.	5:00 p. m.	98.2	19.	9:00 a m.	99.4
11.	4:30 p. m.	99	2.	9:30 a. m.	98.2	19.	5:00 p. m.	99.
12.	10:25 a. m.	99	2.	5:00 p. m.	98	20.	9:00 a. m.	99.2
13.	10:30 a. m.	99.6	3.	9:00 a. m.	98 4	20.	5:00 p. m.	98.8
13.	4:45 p. m.	101.4	3.	5:00 p. m.	99.2	21.	9:00 a m.	98.4
14	4:15 p. m.	100.2	4.	9:00 a. m.	99	21.	5:00 p. m.	98.6
15.	10:00 a. m.	99	4.	5:00 p. m.	99	22.	9:30 a. m.	98.4
16.	10:00 a. m.	98	5.	9:00 a. m.	98.6	22.	5:00 p. m.	98.6
16.	4:45 p. m.	98.6	5.	5:00 p. m.	98.8	23.	9:00 a. m.	98.8
17.	10:00 a. m.	98.8	6.	9:00 a. m.	99	23.	5:00 p. m.	98.6
17.	4:30 p. m.	98.6	6.	5:00 p. m.	99.4	24.	9:00 a. m.	98.8
18.	10:00 a. m.	98.6	7.	9:00 a. m.	98.6	24.	5:00 p. m.	98.4
18.	5:00 p. m.	99.6	7.	5:00 p. m.	99	25.	9:00 a. m.	98.8
19.	9:00 a. m.	99.4						

The animal showed no symptoms whatever during the entire course of the experiment. During the latter part of the feeding he increased in flesh and his coat became quite glossy. After being kept under observation until March 25, the animal was used for another purpose.

Experimental horse No. 13. This animal was a large, old, sorrel horse, thin and weak, and somewhat lame in hind legs. The animal had been down in the stall two or three times before it was purchased by the laboratory. The feeding of good ensilage to this animal was begun Feb. 3, 1903, and after three days the decomposed ensilage was substituted for the good. This was kept up until February 10, when the animal, being in poor physical condition was given again good ensilage and a small grain feed added. It was kept on ensilage until March 5. During this time it exhibited no symptoms of any sort, but increased in weight. On February 22, the animal's temperature arose and remained up for three days without any assignable cause except indigestion. It was kept under observation until April 16, when it was used for another purpose. The temperature during this period is herewith appended.

During the month and a half of the experiment these two horses were given about one ton of the ensilage, one-half of which was in a decomposed condition.

1903. Date. Feb.	Hour.	Temp.
3.	4:00 p m.	99.8
4.	9:00 a. m.	98.2
4.	5:00 p. m.	100.3
5.	11:00 a m.	99.8
5.	5:30 p. m.	100.4
6.	9:00 a. m.	100.2
6.	5:00 p. m.	100.2
7.	11:30 a. m.	99.2
7.	5:05 p. m.	100.2
8.	10:20 a. m.	99.4
9.	10:30 a. m.	100.4
9.	4:30 p. m.	99.6
10.	9:00 a. m.	99.4
10.	4:30 p. m.	100
11.	10:30 a. m.	99 8
11.	4:30 p. m.	99.8
12.	10:20 a. m.	100
13.	10:30 a. m.	99.4
13.	4:45 p. m.	100
14.	4:30 p. m.	100.2
15.	10:00 a. m.	99.6
16.	10:30 a. m.	99.4
16.	4 45 p. m.	99.6

1903. Date. Feb.	Hour.	Temp.
17.	10:00 a. m.	99.6
17.	4:00 p. m.	100.2
18.	10:00 a m.	98.8
18.	5:00 p. m.	100
19.	9:00 a. m.	100.2
19.	5:00 p. m.	99.8
20.	9:00 a. m.	100.6
20.	5:00 p. m.	100.4
21.	9:00 a. m.	100.4
21.	5:00 p. m.	100.4
22.	9:00 a. m.	101
22.	5:00 p. m.	103.2
23.	9:00 a. m.	103
23.	5:00 p. m.	104.6
24.	9:00 a. m.	104
24.	5:00 p. m.	104.2
25.	9:00 a. m.	103 4
25.	5:00 p. m.	102.8
26.	9:00 a. m.	100.6
26.	5:00 p. m.	101.2
27.	9:00 a. m.	100
27.	5:00 p. m.	100.8
28.	9:15 a. m.	101.2
28.	5:00 p. m.	100.8

1903. Date. March.	Hour.	Temp.
1.	9:15 a. m.	99.6
1.	5:00 p m.	100
2.	9:30 a. m.	99.4
2.	5:00 p. m.	100.6
3.	9:00 a. m.	99.4
3.	5:00 p. m.	100.2
4.	9:00 a. m.	99.8
4.	5:00 p. m.	100.2
5.	9:00 a. m.	100
5.	5:00 p m.	100.4
6.	9:00 a. m.	100
6.	5:00 p. m.	100
7.	9:00 a. m.	99 8
7.	5:00 p. m.	100
8.	9:00 a. m.	100.2
8.	5:00 p. m.	100
9.	9:00 a. m.	99.8
9.	5:00 p. m.	100.4
10.	9:00 a. m.	99 4
10.	5:00 p. m.	99.8
11.	9:00 a. m.	99.4
11.	5:00 p. m.	99.8
12.	9:00 a. m.	100
12.	5:00 p m.	99.6

1903. Date. March.	Hour.	Temp.
13.	9 00 a. m.	100.2
13.	5:00 p. m.	100.6
14.	9:00 a. m.	100.4
14.	5:00 p. m.	.....
(No temp.; floor oiled.)		
15.	10:00 a. m.	100.2
15.	5:00 p. m.	100.4
16.	9:00 a. m.	100
16.	5:00 p. m.	100.2
17.	9:00 a. m.	99.8
17.	5:00 p. m.	99.8
18.	9:00 a. m.	100
18.	5:00 p. m.	100.4
19.	9:00 a. m.	99.8
19.	5:00 p. m.	100 6
20.	9:00 a. m.	100 4
20.	5:00 p. m.	100.4
21.	9:00 a m.	100.2
21.	5:00 p. m.	100
22.	9:30 a. m.	99.6
22.	5:00 p. m.	100.6
23.	9:00 a m.	100
23.	5:00 p. m.	100.4

1903. Date. March.	Hour.	Temp.
24.	9.00 a. m.	100.4
24.	5:00 p. m.	100.2
25.	9:00 a m.	100.4
25.	5:00 p. m.	100.2
26.	9:00 a. m.	100.2
26.	5:00 p. m.	100.2
27.	9:00 a. m.	100.4
27.	5:00 p. m.	100.2
28.	9:00 a. m.	100.6
28.	5:00 p. m.	101.
29.	9:30 a. m.	100.6
29.	4:30 p. m.	100.4
30.	9:30 a. m.	100.8
31.	9:30 a. m.	100.4
31.	5:00 p. m	100
April.		
1.	9:15 a. m.	100.4
1.	5:00 p. m.	100.2
2.	9:15 a. m.	100 2
2.	5:00 p m.	100.2
3.	9:15 a. m.	100
3.	5:00 p. m.	100.4
4.	9:30 a. m.	100.6

1903. Date. April.	Hour.	Temp.
4.	5:00 p. m.	100.4
5.	10:00 a. m.	100.2
5.	4:30 p. m.	100.2
6.	10:00 a. m.	100.6
6.	5:00 p. m.	101
7.	9:15 a. m.	100.2
7.	5:00 p. m.	100.6
8.	9:00 a. m.	100.4
8.	5:00 p. m.	100.4
9.	9:30 a. m.	100 4
10.	8.30 a. m.	100.8
10.	5:30 p. m.	100.2
11.	8:15 a. m.	100.4
11.	5:00 p. m.	100 2
12.	10:00 a. m.	100.8
12.	4:30 p m.	100.4
13.	5:00 p. m.	100.6
14.	8:45 a. m.	100
14.	5:00 p. m.	100.6
15.	9:00 a. m.	101
(Down in stall)		
15.	5:00 p. m.	100.6
16.	9:00 a. m.	100.2

Beaver Creek Township, Rock County (*Horses*)—Sunday, Jan. 18, 1903, Dr. Brimhall visited the farm of S. Bros., Beaver

Creek Township, Rock County, eight miles west of Luverne, Minn. He found a two-year-old gray roan filly up in slings. This animal, noted as No. 31, in laboratory record, was taken sick January 17, and was unable to get up without help, but after being lifted with the slings was able to stand without much difficulty. When taken out of the slings walked without showing any special weakness. The only way incoördination showed was when the animal was turned shortly. It ate with difficulty. Coarse food was partially masticated and allowed to drop from the mouth, but it was able to soften the oats sufficiently to permit of their being swallowed. Drinking was difficult also.

Temperature 101.2°, pulse about 45. By artificial light the pupils were apparently not as sensitive as they should be, but when the horse was led into the sunlight they contracted normally. A large number of *strongulis tetracanthis* were noticed attached to the movement from the bowels.

This horse was found dead in the slings on the morning of Thursday, January 22, the owners not having noticed any change in its condition on the night previous. The head and a portion of the backbone were packed and sent to the laboratory.

The specimens when received in the laboratory were all very solidly frozen. On examination the meninges of both brain and cord appeared to be intensely congested.

Cultures were made from the meninges of brain and cord and from the substance of the brain. After incubation the following bacteria were obtained:

1. *Meninges of brain.* Large spore-bearing bacilli and diplococci (*diplococcus pneumoniæ*).
2. *Brain substance.* Large spore-bearing bacilli and diplococci (*diplococcus pneumoniæ*).
3. *Meninges of cord.* Large spore-bearing bacilli and diplococci (*diplococcus pneumoniæ*).

On Jan. 27, 1903, Dr. Brimhall, accompanied by Dr. Wilson, again visited the farm.

On inquiry it was found that S. Bros. had lost in the latter

part of March, 1902, two horses which exhibited symptoms similar to those above described, though they died in less than two days after the onset. The horses which died in March, 1902, had been running in a barnyard with cattle, hogs and other horses. Shortly after the death of the two animals the other horses were removed from the barnyard. All the horses in the spring of 1902 were drinking from a small creek, the water of which was very foul with decaying vegetation. Later in the spring the barnyard was cleaned up, the horses turned into pasture and a new water supply secured from a deep well. No more trouble occurred until December, 1902, when a horse became suddenly sick showing difficulty in swallowing; went down on December 20, and died December 21.

December 31 another animal became sick and died January 3, 1903. January 4, 1903, a blind mare which had been kept in the stable and led to water became sick and died in about thirty-six hours after the onset of symptoms. She was very violent, struggling severely from the first. Jan. 10, 1903, another animal, which had had a subnormal temperature two days before, died. The next horse to become sick was No. 31, seen by Dr. Brimhall. The horses were all being fed on grain, clean hay and straw. There was no ensilage on the place.

January 27, three horses were sick and down with the disease. One seven-year-old gray horse was taken sick January 25, and went down January 26. This is designated No. 32 in these notes. The second, a buckskin colored yearling colt, became sick the morning of January 26, and went down in a few hours after first symptoms appeared. This one is designated as No. 33 in succeeding notes. The third, No. 34, an iron gray yearling colt, had appeared to have some difficulty in chewing and swallowing in the afternoon of January 26, and was found down on its side but able to rise with assistance in the evening. The following morning, January 27, it was down and unable to rise. The temperature of these horses was taken by Dr. Brimhall:

Horse No. 32, 99.6°.
Horse No. 33, 99.2°.

Horse No. 34, 98°.

These animals were all lying out doors, exposed to the cold wind. No. 34 was shivering at the time.

Autopsy Notes, (*Horse No.* 32).—The animal was killed by bleeding and an autopsy made at once.

Throat and pharynx were found normal. The lungs showed hypostasis in dependent portions. On the upper right lung a large blood stained area was present. On cutting into this the staining was found to be very superficial. The horse had been lying on this, the right side, on the previous day and had been turned over. The staining was probably the remains of hypostasis which had been almost eradicated by the change in position.

The epicardial surface of the heart showed considerable roughening or pitting. There was no change of color about these roughened areas and no deposits of fibrin. The heart in its pericardium had been exposed for some time to a cold wind before the pericardium was opened. This apparent roughening may have been caused by chilling of the tissue before it was completely dead. Several small hæmorrhagic areas were found in the endocardium. The spleen was small, tough and dry; normal in color. The liver was yellowish and fatty in appearance. It also showed small petechial hæmorrhages scattered over the surface. The alimentary canal and mesentery were apparently normal except for the presence of aneurisms containing *strongylus armatus* within the mesenteric arteries. The stomach contained large numbers of bots. Kidneys were apparently normal except for a small collection of serum extra-capsular about the right one. The frontal sinuses were opened and the lining found to be apparently normal. On opening the spinal canal in the cervical region a large quantity of yellowish serum flowed out. The meninges of both brain and cord were markedly congested. No pus was present. Considerable fibrin was adherent to the occiput about the foramen magnum extra-durally. The base of the cerebellum and region of the pons showed the greatest congestion. The auditory nerves were apparently fatty in almost all their bundles.

Direct coverslip preparations, cultures and tissues for histological examination were collected from lung, heart, spleen, liver, kidney, frontal sinuses, brain, cervical and lumbar spinal cord.

Direct coverslip preparations stained with eosin and methylene blue showed bacteria as follows :

Lung. No bacteria.

Heart. No bacteria.

Spleen. No bacteria.

Liver. No bacteria.

Kidney. No bacteria.

Frontal sinus. No bacteria.

Meninges of brain. Lanceolate, encapsulated, Gram-staining diplococci, some intra- and some extra-cellular.

Meninges of cervical cord. Lanceolate, encapsulated, Gram-staining diplococci, some intra- and some extra-cellular.

Meninges of lumbar cord. Lanceolate, encapsulated, Gram-staining diplococci, some intra- and some extra-cellular.

Cultures in broth and on serum after incubation showed bacteria as follows :

Lung. No bacteria.

Heart. No bacteria except one broth culture in which a large spore-bearing bacillus was found (probably a contamination.)

Spleen. No bacteria.

Liver. No bacteria.

Kidney. No bacteria.

Frontal sinus. No bacteria.

Brain. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Cervical cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Lumbar Cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Autopsy Notes (*Horse No.* 33).—The colt was killed by bleeding and an autopsy made at once.

The throat, pharynx and trachea were apparently normal. Lung was normal. Heart showed small hæmorrhages in endocardium. Spleen small in size, normal in color, tough and fibrous. Liver was fatty. Stomach contained bots. The remainder of the alimentary canal was normal. The mesenteric arteries contained several areas in which the walls were roughened and thickened due to the presence of *strongylus armatus*. The kidneys were normal. On opening the spinal canal in the cervical region a large amount of yellowish serum escaped. The meninges of the brain and spinal cord were markedly congested, especially about the cerebellum and pons. The frontal sinuses were examined and found to be apparently normal.

Direct coverslip preparations, cultures and tissues for histological examinination were collected from the lung, heart, spleen, liver, kidney, frontal sinuses, brain and cervical and lumbar cord.

Direct coverslip preparations stained with eosin and methylene blue showed bacteria as follows:

Lung. No bacteria.

Heart. No. bacteria.

Spleen. No bacteria.

Liver. No bacteria.

Kidney. No bacteria.

Frontal sinus. Small, slender bacilli.

Meninges of brain. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Cervical and lumbar cords. Diplococci indistinguishable from those described under case No 29. See page 957. (*Diplococcus pneumoniæ.*)

Cultures in broth and on serum on examination showed bacteria as follows:

Lung. No bacteria.

Heart. No bacteria.

Spleen. Small streptococci.

Liver. No bacteria.

Kidney. No bacteria.

Frontal sinus. Small, slender motile bacilli.

Meninges of brain. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ*) and a few colonies of streptococci.

Cervical spinal cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ*) and a few colonies of streptococci.

Lumbar spinal cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ*) and a few colonies of streptococci.

February 28, rabbit No. 689 was inoculated in left subdural space with 0.2 c.c. of an emulsion of water of condensation of the serum culture, second from horse No. 33. The animal was exhibiting marked symptoms of meningitis on the morning after inoculation and was dead by evening of the same day, March 1.

March 3, 1903, a pig (No. 1), weight about 50 pounds, was inoculated subdurally over the lumbar cord with about 7 c.c. of the emulsion of a 24-hour broth and a 24-hour serum culture, originally from rabbit No. 689. Four hours after the inoculation the pig began to be excited; ran about the stall for some time, then became partially paralyzed in the posterior extremities and though still excited was unable to drag itself about the stall. It was found dead on the morning of the day following the inoculation. On laying bare the spinal cord and brain, the spinal canal was found to contain a large excess of fluid. The pia of both cord and brain was intensely congested. Direct coverslip preparations and cultures from the meninges of cord and brain showed *diplococcus pneumoniæ* in abundance unmixed with other organisms.

March 6, 1903, at 10:20 A. M., experimental horse No. 15

was inoculated by lumbar puncture through the dura of the spinal cord with 7 c.c. of a broth culture second from experimental pig No. 1 and (horse) meningitis case No. 33.

This animal had been under observation in the laboratory for 14 days, during which time his temperature had been taken twice daily and had varied from 98.8° to 100°. The animal was in perfect health at the time of the inoculation. The following notes of his symptoms are herewith given.

Inoculated 10:20 A. M., 10 c.c. emulsion.

1903.

Date March.	Hour.	Temp.	
6.	12:00 m.	100	Fed. Did not eat.
6.	1:00 p. m.	100.2	Trembling.
6.	1:20 p. m.	....	Trembling. Respiration 24, in coördination.
6.	2:30 p. m.	....	Water coming from nose in drops.
6.	3:30 p. m.	103	Unable to stand still. Respiration 56.
6.	4:20 p. m.	....	Wet with perspiration. Respiration 48.
6.	5:00 p. m.	103	Respiration 48. Very restless on forefeet. Sensitive to touch. No urine or fæces voided since inoculation.
7.	7:30 a. m.	102.2	Not so restless. Stronger on his legs.
7.	9:00 a. m.	102.4	Unable to put down his head to drink.
7.	1:00 p. m.	102.6	Eats grain and hay.
7.	5:00 p. m.	102.6	Milky substance running from nostrils.
8.	9:00 a. m.	102.6	Still nervous. Eating well.
8.	5:00 p. m.	102.2	Nervous. Eats oats and a little hay.
9.	9:00 a. m.	101.6	Heavy perspiration on sides and flanks, spasmodic jerking of flanks.
9.	5:00 p. m.	102.4	Still nervous. Eats hay. No oats.
9.	7:50 p. m.	. . .	Down on right side, kicking vigorously, apparently in pain.
10.	8:00 a. m.	....	Found dead.

Autopsy made at 9 a. m., body still warm.

On removing the skin, several small hæmorrhages were found in the subcutaneous connective tissue. The lungs showed some congestion, probably hypostatic.

The heart showed small hæmorrhages in the anterior auriculoventricular groove.

Spleen was normal in consistency and size. Weight, three pounds.

Liver normal in appearance. Weight 15 pounds.

Intestines apparently normal. Large aneurism filled with strongyli in the middle mesenteric artery.

Kidneys apparently normal. Weight of left kidney, one and three-quarters pounds.

On opening the spinal canal and the dura, the subdural space was found filled with a hæmorrhagic exudate. This was most marked in the lumbar region several inches above and below the point of injection, but extended in a lesser degree to the cervical region. The meninges of the brain especially at the base were also markedly inflamed.

Direct coverslip preparations, cultures and tissues for histological examination were collected from lung, heart, spleen, liver, kidney and sacral, lumbar, and cervical spinal cord and meninges of brain.

Direct coverslip preparations from meninges of the spinal cord stained with eosin and methylene blue showed large diplococci, indistinguishable from those inoculated. After 48 hours in the incubator cultures gave results as follows :

From the lung, heart, spleen, liver and kidney, no growth.

From the meninges of the spinal cord at the site of inoculation, four inches back of the site of inoculation, 10 inches in front of the site of inoculation, cervical region and the meninges of the brain, all gave apparently pure cultures of a large Gram-staining diplococcus indistinguishable from that inoculated—(*diplococcus pneumoniæ*.)

Autopsy Notes (*Horse No.* 34).—Animal was killed by bleeding and an autopsy made at once.

Throat, pharynx and trachea normal. Lungs normal. Endocardium showed small hæmorrhages. The spleen was small and tough ; normal in color. Liver fatty. Stomach contained bots. The remainder of the alimentary canal showed no lesions. The greater mesentery showed an enlargment about four inches in length containing dark colored fluid and a number of immature worms (*strongylus armatus*). Kidneys were normal. Frontal sinuses were normal. Upon opening the dura in the cervical region of the spinal cord a large amount of bloody serum flowed out. The meninges of the brain and spinal cord were congested, markedly so about the base of the cerebellum and pons. Direct coverslip preparations, cultures and tissues for histological examination were collected from the lungs, heart, spleen,

liver, kidneys, frontal sinus and brain and cervical and lumbar regions of the spinal cord.

Direct coverslip preparations stained with eosin and methylene blue on examination showed bacteria as follows:

Lungs. No bacteria.

Heart's blood. No bacteria.

Spleen. No bacteria.

Liver. No bacteria.

Kidney. No bacteria.

Frontal sinus. Staphylococci.

Meninges of brain. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Cervical spinal cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Lumbar spinal cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Cultures in broth and on serum on examination showed bacteria as follows:

Lungs. No bacteria.

Heart. No bacteria.

Spleen. No bacteria.

Liver. No bacteria.

Kidneys. No bacteria.

Frontal sinus. Staphylococcus pyogenes albus.

Meninges of brain. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Cervical spinal cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Lumbar spinal cord. Diplococci indistinguishable from those described under case No. 29. See page 957. (*Diplococcus pneumoniæ.*)

Feb. 9, 1903, rabbit No. 672 was inoculated in left ear vein with 0.3 c.c. with broth culture of *diplococcus pneumoniæ* from this case. The animal exhibited no symptoms during the ensuing two months, when it was used for another purpose.

Later S. Brothers reported the death of two more horses during the month of February from the same disease.

It will be seen from the above notes that *diplococcus pneumoniæ* was recovered unmixed with other organisms from the central nervous system of all of the horses examined in this outbreak; that it was inoculated in pure culture into rabbits, one pig and one horse; that in each of these animals symptoms and lesions of meningitis with death were produced; that the organism was recovered unmixed with other bacteria at autopsy of each of the animals. The demonstration of the etiological significance of the diplococcus pneumoniæ in these cases would therefore seem to be complete. It may be noted that none of the horses in this last described outbreak had ever been fed on ensilage, but had been on good hay and grain, and well cared for.

Lebanon Township, Dakota County, (Sheep)—March 18, 1903, Dr. Annand visited the farm of Mr. D. D., in Lebanon Township, Dakota County, near Rosemount, and investigated an outbreak of a disease among sheep. The first symptoms the sheep showed were a drooping of the head and listlessness. "Later they would elevate the head quite suddenly and hold it in the air for a while. In a couple of days they would go down and be unable to rise. While down they would keep the head extended as far back as possible. They had lived from three days to two weeks after getting sick. There was only one that had made what seemed to be a partial recovery. This was able to rise and move about, but had taken a relapse." Eight out of a herd of 60 had been lost. Dr. Annand made autopsies on two of the animals and brought material to the laboratory for examination. There was inflammation of the meninges and the gray matter of the spinal cord. At the base of the brain there was considerable inflammation. Externally the surface

of the brain was very highly congested. On cutting into the cord some fluid was discharged.

Sheep 1.—Smears from the meninges stained by eosin and methylene blue showed what appeared to be large and small bacilli, possibly diplococci.

Cultures from the liver gave a diplococcus in pure culture (*diplococcus pneumoniæ*). Cultures from the heart and meninges gave colon bacilli. No growth from any of the other cultures.

Sheep 2.—Cultures from meninges gave *diplococcus pneumoniæ* in pure culture. Cultures from the spleen gave *diplococcus pneumoniæ* and a white staphylococcus. No growth from any of the other cultures.

TABLE SHOWING ANIMALS DEAD OF CEREBRO-SPINAL MENINGITIS FROM 1898 TO APRIL, 1903.

HORSES.

No. of Outbreak.	Date.	County.	Animals Sick.	Animals Dead.
*1.	June, 1899	Grant	6	6
*2.	June, 1900	Ramsey	1	1
*3.	Nov., 1900	Douglas	5	4
4.	Jan., 1903	Freeborn	5	5
5.	Jan., 1903	Rock	12	12
			29	28

CATTLE.

No. o Outbreak.	Date.	County.	Animals Sick.	Animals Dead.
*1.	Sept., 1898	Dakota	5	5
*2.	June, 1900	Ramsey	1	1
*3.	Sept., 1900	Hennepin	3	3
4.	Jan., 1901	Stearns	5	5
5.	Jan., 1901	Carver	6	5
6.	June, 1901	Rice	9	9
7.	Sept., 1901	Lyon	7	5
8.	Feb., 1902	Stearns	..	..
			36	33

SHEEP.

No. of Outbreak.	Date.	County.	Animals Sick.	Animals Dead.
1.	Mar., 1903	Dakota	8	8

* These cases have been reported in the Biennial Reports of this Board for the years indicated by their dates.

SWINE.

No. of Outbreak.	Date.	County.	Animals Sick.	Animals Dead.
1.	Jan., 1903	Carver	9	9
15.			82	78

SUMMARY.—1. The preceding detailed statement and table show that from September, 1898, to April, 1903, this board has investigated five outbreaks of cerebro-spinal meningitis in horses, eight in cattle, one in sheep and one in swine, making 15 outbreaks in all. These have been distributed in 11 counties. Of the 29 horses sick of the disease, 28 have died. Of the 36 sick cattle, 33 have died. All of the eight sheep and nine swine sick of the disease died, making a total of 82 sick animals with 78 deaths, or a mortality of about 95 per cent.

2. The symptoms may be summarized as follows:

Horses.—There was usually "slobbering" at the mouth, uneasiness, loss of power of deglutition, posterior incoördination, gradual posterior paralysis, rapidly ascending, and rapid loss of sensation over posterior extremities. In some instances evidence of involvement of the meninges of the brain was shown by frenzy and failure of pupils of eyes to react to light. Temperatures ran as high as 105° F., but dropped to normal or subnormal as paralysis ascended.

Cattle.—In most of the cattle examined the symptoms indicated early brain involvement. The animals, at first somewhat stupid, but with a wild staring look in the eyes, shortly became frenzied and rushed about the enclosure attacking other animals. The pupils failed to react to light and some of the animals became, apparently, completely blind. After a short time, the posterior extremities showed incoördination, which was followed by both motor and sensory paralysis, which progressed to the death of the animal.

Sheep.—In the only outbreak observed among sheep, the symptoms began with listlessness and drooping and shaking of the head. After a little while the animals became unable to stand. When lying down the head was retracted. Animals died after an illness lasting from two to fourteen days.

Swine.—In the only outbreak observed in swine, the disease took a sub-acute course. The animals had recurrent "fits," during which time they had short gasping respiration and paralysis of the posterior extremities. The attacks became more frequent and longer in duration after a few days until the animals were continually paralyzed. The paralysis slowly increased and the animals died after about two weeks' illness.

3. No significant lesions were found at autopsy in any of the animals except in the central nervous system. In horses, on opening the spinal canal, a large amount of yellowish or red colored serum escaped. In several cases a quantity of yellowish coagulated serum (fibrin) was attached to the pia of the cord and base of the brain. The meninges of both the cord and brain were uniformly congested, especially in the cervical region of the cord and about the base of the cerebrum.

In cattle, while there was some increase in the amount of cerebro-spinal fluid, it was not so markedly increased as in the horses. The meningeal inflammation was clearly observable. This was especially true of the base of the brain and upper spinal cord.

The same was true of the sheep and swine examined.

4. Of the nine horses on which laboratory examinations have been made, all have shown histological lesions of meningitis with the presence of diplococcus pneumoniæ in direct coverslip preparations, tissues and cultures from the central nervous system.

During the time that the examinations were being made on the above mentioned cases of meningitis in horses, cattle, sheep and swine, similar examinations were made on 16 cases of suspected meningitis in man. The strains of diplococci isolated from the human cases were carefully compared with those isolated from animals. It has been impossible to differentiate the organisms from diplococcus pneumoniæ obtained from human sources by cultural methods.* The variation in acid produc-

* For cultural characteristics see page 461 Biennial Report this Board for 1899-1900, and p. 957 of this report.

tion and milk coagulation is not greater than between different strains isolated from human sources. When inoculated into rabbits, the organisms appear to have a uniformly less degree of virulence for these animals than do freshly isolated strains of diplococcus pneumoniæ from human sources. This variation, however, is not greater than the variation between different strains of diplococcus pneumoniæ from meningitis and pneumonia in man. Besides a number of rabbit inoculations, the ætiological relationship of diplococcus pneumoniæ to meningitis in horses has been further shown by its inoculation into three horses, one subcutaneously, and into the carotid artery, another under the dura of the brain and the third under the dura of the lumbar cord. All of these animals died after exhibiting symptoms of meningitis. At autopsy, the inoculated organism was recovered from the central nervous system unmixed with other bacteria.

It is worthy of note that one strain of diplococcus pneumoniæ originally from a *horse*, after a single passage through a rabbit, was inoculated into the dura of the lumbar cord of a *pig*. The pig died after exhibiting symptoms of meningitis and diplococcus pneumoniæ was obtained in direct coverslip preparations and cultures from the meninges of both cord and brain unmixed with other organisms.

It should be noted that of the five outbreaks of meningitis in horses, only one gave a history of ensilage feeding. It so happened that all the other animals were good horses and were being well cared for and fed on good sound grain or hay. About one ton of ensilage from the silo concerned in the one outbreak noted above, was fed to two horses in the Research Laboratory without the production of any symptoms of meningitis. In the same outbreak *diplococcus pneumoniæ* was isolated from both of the two horses examined.

Of the five cows on which laboratory examinations were made, histological lesions of meningitis were present in all. From one an organism closely resembling, if not identical with, diplococcus intracellularis in man, was isolated. From three of

the others, diplococci indistinguishable from diplococcus pneumoniæ were found in the meninges of the brain and cord.

From the meninges of the two sheep examined, diplococcus pneumoniæ was isolated.

Cultures from the meninges of the two pigs examined showed diplococcus pneumoniæ.

5. The clinical diagnosis of meningitis due to diplococcus pneumoniæ in horses, cattle, sheep and swine would seem to be exceedingly difficult to make. The disease described by Pearson* as forage poisoning in horses apparently so closely resembles meningitis due to diplococcus pneumoniæ that it would seem that only a careful bacteriological examination would serve to differentiate the two. The differentiation of the disease from rabies in cattle is practically impossible without a laboratory examination. The meningeal form of hæmorrhagic septicæmia in cattle does not ordinarily produce so much excitement as does meningitis in cattle due to diplococcus pneumoniæ, but where the meninges of the brain are early affected by *B. bovisepticus* (see *hæmorrhagic septicæmia* outbreak No. 75) the symptoms so closely resemble the symptoms caused by diplococcus pneumoniæ that a careful laboratory examination is necessary in order to differentiate the two.

In making post-mortem examinations of animals it must be borne in mind that the gross lesions of meningitis sometimes appear to be insufficient to account for the severity of the symptoms. The presence or absence of inflammatory changes or bacteria can frequently be determined only by histological and cultural examinations. If these are not carefully made, the meningeal character of a disease with suggestive symptoms cannot properly be excluded.

6. The treatment of meningitis as it has come under the observation of this board would seem to be of little avail.

7. The separation of the sick from the well animals and the careful disinfection with chemicals and by fire appear to be the

* *Journal of Comparative Medicine and Veterinary Archives*, 1900, Vol. XXI, p. 654.

most effective means of checking the progress of the disease in a herd.

8. In connection with meningitis in various animals, there had been planned in the laboratory a series of experiments consisting of cross inoculations and cross immunizations of various animals with cultures of diplococcus pneumoniæ from various sources, to determine the variation or identity of the infecting bacteria. In connection with this it was hoped that it might be possible to produce an immunizing serum by means of some of the strains virulent to larger animals.

THAT an association for the relief of disabled professional drivers is needed was indicated by an incident at the sale at Madison Square Garden recently. Six well known horsemen were seated around a table, when George Starr, who was going about with the aid of a cane, an electric knee boot, and a pair of ice creepers, as the result of an accident at Boston last summer, inquired whether any one else in the party had ever been injured when driving. It turned out that only one man among the six had escaped.

PROSECUTING ILLEGAL PRACTITIONERS IN NEW YORK STATE.—Drs. E. B. Ingalls, H. D. Stebbins and William Henry Kelly, constituting the Prosecuting Committee of the New York State Veterinary Medical Society, have recently, through their attorney, Mr. Harry W. Mosher, of New Berlin, N. Y., obtained judgment in the Supreme Court of Chenango Co., for $200 with costs, amounting to about $90 additional, against Mr. Cranston Owens, of New Berlin, N. Y., who has been practicing veterinary medicine and surgery without being registered in the county clerk's office of Chenango Co., as required by law. Mr. Owens is said to be a graduate of Toronto.

"SNYDER," said to be the tallest if not the heaviest horse in the world, is to be exhibited at the Louisiana Purchase Exposition in St. Louis next year. He is a three-year-old Percheron gelding, twenty-one hands high, and he tips the scale beam at 2700 pounds. His groom has to stand on a step ladder to reach his back in cleaning him. That the horse is a freak in more ways than one appears from the fact that growing out of each side of his head is a well-defined horn about one inch long. "Snyder" was exhibited at several Western fairs last season, attracting marked attention everywhere. He was bred by H. D. Snyder, of Millersburg, Ohio, but is now owned in Cleveland.

INTRAVENOUS INJECTIONS.

COMPILED FROM NOTES AND OBSERVATIONS, BY WALTER F. SYKES, NEW YORK.

"Intravenous injections must come into practice. They are not dangerous nor are they difficult, as generally supposed."—("Traité de Thérapeutique et de Matière Vétérinaire Médicale" de M. Kaufmann, Professeur de Physiologie et de Thérapeutique à l'Ecole d'Alfort).

The administering of medicines both to man and beast by intravenous injection is held by many eminent authorities to be the only rational method whereby prompt and efficient action in acute as well as chronic affections may be obtained. It needs only to be said to be admitted that medicines so administered must, of necessity, be much quicker and surer in results than when taken into the stomach and intestines, the absorptive or assimilative powers of which are impaired because of the illness or disease the patient is suffering from. The drug or medicine passes immediately into the circulating blood, its action is immediate and its effectiveness assured.

Up to a comparatively recent date, the term "intravenous injection" was considered synonymous with "transfusion of blood." This, possibly necessary, but nevertheless improper comparison, will probably explain the disfavor with which intravenous injections are viewed by many physicians and surgeons where the veins are used as a medium for the administration of remedial or curative agents.

Even so eminent an authority as Prof. H. Soulie, in his "Classical Treatise on Therapeutics and Pharmacology," writes as follows:

"Regarding intravenous injections, or the introduction of medicines into the body, I can only say that, a few special cases being excepted, they belong to experimental therapeutics, excepting for the transfusion of blood and for salt injection, which can sometimes be substituted for intravenous injections."

This exception in favor of transfusion and salt injections is

evidently made only because a patient may be in such desperate condition that the most daring operations would seem to be justifiable, but it is the apparent disapproval of intravenous injections that we wish to antagonize. The task is rendered difficult, from the fact that Prof. Soulie does not state his source of information, nor does he give any details of experimental work which would, even in small measure, justify his holding such an unwarranted opinion.

For this reason, I will later on take up and consider every possibility of accident which theoretically or practically might occur in the administration of intravenous injections, in order to show that all objections raised have been in the past and are to-day wholly imaginary.

Before doing so, I desire to quote from an article on "The Technique of Intravenous Injections," by Dr. Jules Renault, in the *Archives Générales de Médecine*, of May 5, 1903, as follows:

"One of the legacies left us by our medical forefathers has been hitherto the fear of interfering with veins, and those amongst us who have witnessed the end of the reign of sepsis can easily understand it. Fortunately for us these ideas no longer prevail, and intravenous injection, *under any circumstances the slightest of all operations on veins*, is no longer dreaded, save by timid souls or by such as reverence tradition so deeply as to disallow any discussion of its teachings.

"The only serious danger of these injections, which, by the way, were practiced as far back as the 18th Century, was, of course, infection. Parallel with good results then obtained, there were observed others so disastrous as to force the abandonment of the method. Nowadays antisepsis has abolished the possibility of phlebitis, a complication which proceeds not from any especial susceptibility of the venous walls, but solely from the organisms introduced. It may be avoided by the observance of the rules of asepsis and antisepsis, nowadays so simple as to be familiar to the youngest student.

"Another source of fear used to be the introduction of air into the veins, a fear which may now be said to be chimerical.

I am ignorant as to what is the general belief of surgeons concerning the introduction of air into a vein during operations on the neck; but of this I am certain, that the introduction of even a large bubble of air into a vein of the elbowfold *remains without any effect at all*, whether for good or ill, whether immediate or remote.

"An objection frequently made is that intravenous injection is at least a delicate operation, if not a difficult one. This very fact serves as the *raison d'etre* of this article, and may excuse the discussion of minute detail, upon which I feel obliged to insist, even at the risk of being considered tiresome."

The accidents possible referred to are gaseous emboli, phlebitis, the production of emboli, and infection, which we consider as follows:

Gaseous Emboli.—Considering the position of the syringe when making an intravenous injection, it is absolutely impossible to inject air into the vein, unless the surgeon really endeavors to obtain this result. As a matter of fact, the syringe should contain no air, but if it does, the bubble will always rise towards the piston. Supposing, however, that a bubble of air *is* injected into a vein, it will not cause any inconvenience or serious consequence, as it will be rapidly dissolved in the blood.* Needless to say, it is the duty of the surgeon making the injection to force air out of the syringe by adopting the ordinary precautions known to even the youngest students nowadays, before the barrel of the syringe is attached to the needle. Gartner has proven conclusively that where an injection is made slowly, a

* Note.—Since writing this article, I have noticed in *The Trio*, January, 1903, an article therein published from which I extract as follows, viz.:

"Just a word as to the danger of air injections. It has been proved time and again that the subcutaneous and even the intravenous injection of air in comparatively large quantities is harmless. This was proved by numerous experiments performed under the supervision of Dr. Chas. T. McClintock (see *Therapeutic Gazette*, July 15, 1897, or *Jour. Amer. Med. Association*, Feb. 27, 1897)."

It is important in this connection to note the fact that the injection of air into the tissues is now used by a number of physicians in the treatment of neuralgia and other affections.

So much for the air-injection bugaboo.

fairly large quantity of oxygen can be injected without inconvenience or injurious results.

Phlebitis.—It can be said, as the result of extensive experimental work, and also as the opinion of many surgeons, that injections of salt water, repeated blood-lettings and accidents which may cause injury to veins *never cause or provoke phlebitis.*

The Production of Emboli.—This can be easily avoided if care is taken not to inject intravenously any oily or leucocytic substance (cocaine) or any other substances which might, chemically, provoke coagulation of the blood.

Infection.—The danger of infection is much less with intravenous injections than with hypodermic injections. Even should the injected liquid or solution not be perfectly sterilized, the few microbes, if any there might be in it, would be immediately destroyed by the blood leucocytes. The fact that intravenous injections are neither difficult to perform nor dangerous in effect, is not a matter of opinion, but can be advanced as the result of scientific work, experimental and in practice, by many eminent surgeons; for, though this method has not yet been generally adopted, its supporters are legion and those who practice it are renowned in the profession. Of what use would experimental therapeutics be if the results obtained could not be adopted, despite the ignorance or prejudice of those who may decry them?

Even had I the desire so to do, the space at my disposal would not permit me to enumerate all those who have regularly used this method of treatment, some of them in thousands of cases. I can but give the names of a few, coupling with them the statement that to Italy is the principal credit due for the advancement of scientific research in this direction and in Italy are its warmest partisans and strongest supporters. France is only second to Italy in its adoption as an improved method of treating many diseases both in man and beast. Dr. V. Patella, of Sienne; Dr. Boari, of Pescia; Dr. Sebastiani, of Monte Castellindi Umbastida; Drs. Bacelli, Peroni, Gaguoni and Sylvo, of Italy, and Dr. Cairus, of Glasgow; Dr. Mongour,

of Bordeaux; Drs. Pichard and Cotty, of Paris; Dr. Canas, of St. Denis; Drs. Grenot and Brunet; Auger and Bourgeois; Giffard, Barbier, Maillard, of Paris; Drs. Chigot and Coret, of Aubervilliers; Dr. Huet, President of the Société de Medecin Veterinaire Pratique, and Dr. Guillemard, former president of the same association.

Dr. Mongour states that intravenous injections have never provoked or been followed by accident of any kind or description, local or general, immediate or remote; that they have never produced the slightest albuminuria!

Dr. Alex. Renault is authority for the statement that intravenous injections of cyanide of mercury are absolutely painless, that they do not produce swelling and that their efficacy is quickly apparent.

Dr. Francis Munch employs intravenous injections of adrenolin in cases of apparent death.

Dr. Netter has made hundreds of injections of collargol and has never had an accident of any kind.

When it is considered that the colloidal state of silver disappears quickly in contact with the serum of the blood and that a thin precipitate of metallic silver is thus formed, it can easily be seen that fear entertained because of particles in suspension in the liquid to be injected, is without foundation.

Many thousands of intravenous injections of Tallianine have been made in France and other countries of Europe and also in the United States without accident of any kind or description, grave or slight.

TECHNIQUE.

The Syringe should be a graduated one and of easy sterilization. For injections of cyanide of mercury it is important to have one in which the liquid does not come into contact with any metal. The syringe of Luer, in which both barrel and piston are of glass, is very suitable, though it might advantageously be provided with a slider to hold the piston and prevent its being pulled out of the barrel.

The Needle should be of iridium-platinum so that it may be

passed through the flame before each injection. One recommendation I do strongly make: that is, to use needles which are beveled very short. Such needles are more easily handled than those in common use; they make the smallest possible wound in the vein wall and the point is not so long as to touch the posterior wall of the vein when the orifice has come to the centre of the lumen.

The jugular vein is usually selected for the injection with the larger animals. The neck should be washed with a 1–2000 bichloride solution. With the thumb of the left hand make

firm pressure on the vein in an upward direction, below the point chosen for the injection, until the distended vein can be clearly distinguished, palpating it with the finger of the right hand to observe the wave motion; then with the right hand enter the needle (previously sterilized) in the vein, at an angle of 40 to 45 degrees with its axis, and penetrate the skin quickly but the vein slowly and steadily without jerking. If it is introduced with a sharp, rapid stroke it may pass beside the vein

or transfix it; whereas, if advanced slowly, it is kept constantly in the desired direction and it is easy to appreciate exactly the direction it takes. As soon as one has got through the skin and through the anterior wall of the vein, one can often appreciate very distinctly the fact that the point of the needle lies in the lumen of the vein; thereupon the point must be advanced a little further in the long axis of the vessel in order to prevent it from disengaging during the movements to follow.

If blood does not flow from the needle after it is entered, it is evidence that the needle is in the cellular tissue, when it must be withdrawn and the operation begun over again. If a very small quantity of blood mixed with air appears, it shows that the point lies in the wall of the vein, either in the anterior wall or, more frequently, in the posterior, in which case it must again be withdrawn.

When now it is quite certain that the point of the needle is well within the lumen and not in the wall of the vein or in the surrounding cellular tissue, the syringe, which has been pre-

viously filled with the liquid or solution to be injected, is, with the right hand, attached to the needle, and the piston slowly and steadily pressed home, giving it at the same time, if it does not slide easily, slight rotary movements from right to left.

The liquid is carried off by the blood current as fast as it is injected, without producing even the slightest swelling at the point of injection. If any prominence is caused by the expulsion of the first few drops, it is proof positive that the needle is not in the vein, but in the cellular tissue, when it must be withdrawn. There should be no restiveness on the part of the animal, as an intravenous injection is entirely painless if the operation is properly performed.

The injection being finished, the needle is grasped at the shoulder so that both syringe and needle may be withdrawn rapidly and with one movement.

In making the injection on the right side of the neck, use the middle finger of the left hand for compressing the vein. The left hand should always be used for this purpose and the right hand for the needle and syringe, unless the operator is left-handed, when the reverse will apply.

In conclusion, I may say that the opportunities for intravenous injections will become more numerous the less they are feared and the better they are known. The diseases already so treated offer a wide field for their application and are but the beginning of the possible list for the future.

PROF. J. BETHUNE STEIN, chair of physiology, New York-American Veterinary College, was married on Dec. 22, at Philadelphia, Pa., to Miss Charlotte Ashton Stockwell. The doctor is a son of the late Alex. W. Stein, who for many years filled so admirably the same position in the American Veterinary College, and whose identity with the early days of veterinary education in this country will ever remain a monument to his devotion to a cause for which he had the greatest respect and sympathy, and to which he contributed so much. The younger Stein has inherited the enthusiastic interest of his sire, and we wish him great joy in his new estate.

ABORTION.

By Dr. M. H. Reynolds, Veterinarian Minnesota Agricultural Experiment Station, St. Anthony Park, Minn.

I have undertaken to collect certain statistics and information concerning this disease. Copies of the following form were sent to the entire membership of the Minnesota State Dairymen's Association. As yet I have had but comparatively few replies.

"How many cows do you generally keep in your herd?

"How many abortions did you have during the year prior to November 1st, 1903?

"Were the aborting cows closely associated in the stable, or otherwise?

"Was there any uniformity in the age, breed or type of cows affected?

"Can you give any information as to your probable source of infection?

"Was there any uniformity as to the periods at which the calves were dropped?

"If you have had previous experience with infectious abortion, how long did the trouble last in your herd before it disappeared?

"What preventive or curative treatment, if any, did you adopt, and with what results?

"Yours very respectfully,

"M. H. Reynolds."

The following is a summary of the information gathered in this way:

Eight reports were received. Three owners reported that they had never had the disease in their herds. In another report out of a herd of 80 to 100 cows, four had been affected; in two herds averaging about 18 cows there had been two cases; one in a herd of 12; and in another herd about one-half the cows had been troubled with this disease. In nearly every case the cows had been closely associated or at least in the same stable;

in one case it was reported that the cows aborting stood side by side.

Two owners reported the disease to be brought in by cows being brought to the herd from farms whereon the disease existed, while the owners of the other herds could give no history.

One man reported having used carbolic acid with good results, another used mercury and glycerine, and another used patent medicine.

Causes.—There are at least four general causes of abortion among cattle: 1st, and most important, infection, *i. e.*, bacteria; 2d, poor physical condition of either sire or dam, or both; 3d, sewage and other objectionable materials in drinking water; and, 4th, injuries and accidents of various kinds including doses of unsuitable medicines. It is generally believed that smut, bunt, rust and various other vegetable parasites that infect the food materials may cause abortion, but it is apparent that, except in the case of ergot, the importance of these as causes has been over estimated.

By "poor physical condition," as used in this discussion, it should be clearly understood that this does not necessarily mean thin flesh, but rather lacking in animal vigor and vitality. It should be borne clearly in mind that an animal may be fat and yet not in good physical condition from a health standpoint. Pure-bred stock is often kept in high flesh with little or no exercise and under conditions which render absolutely impossible a high grade of animal health, although the animals may be in the pink of condition from the butcher's standpoint.

Predisposing causes are in a general way those conditions which tend to reduce animal vigor: constant stabling with lack of exercise, ventilation and sunshine; perhaps early breeding, and a strain on the system from long-continued production of large quantities of milk.

The infectious type of the disease is caused by a bacterium.

Bacteriology.—Prof. Bang, of Copenhagen, has done most careful and thorough work in investigating the cause of this disease, and arrives at a conclusion based upon satisfactory evi-

dence that infectious abortion is a result of chronic uterine catarrh caused by a small bacillus, the specific cause of this disease.

In the early part of Prof. Bang's work with this disease, he secured a pregnant cow from an infected herd, selecting an animal which was then showing symptoms of approaching abortion. This cow was killed and the uterus and membranes with the contained fœtus were carefully removed. A considerable amount of dirty yellow slimy material was found between the uterus and the fœtal membranes, and between the different layers of these membranes a thin, clear fluid of a gelatinous nature was found in considerable quantity. The unbilical cord was much swollen and dropsical. The fœtus had apparently undergone about seven months development. Laboratory investigation of the dirty yellow exudate revealed the presence of a small bacillus present in pure culture in enormous numbers. Using this as a basis and following the clue, 21 other cases of infectious abortion were studied and were found to correspond very closely in examination, post-mortem and in other study with the first one. The bacillus was isolated, and by careful experiments was apparently demonstrated to be the specific cause of the disease. During the course of his studies, he developed the very important fact that abortion bacilli may be present, alive and virulent in the pregnant cow, and yet not result in expulsion of the fœtus. Occasionally there results only the death of the fœtus and its retention in a mummified form.

Practical observers have often reported that calves born in a stable where infectious abortion prevails frequently die at an early age from incurable diarrhœa. Nocard demonstrated the presence of abortion bacilli in very large numbers in the intestines of calves which had been born dead or died soon after birth in abortion stables. The contents of the intestines of the calf which has neither breathed nor taken milk, should be sterile; *i. e.*, free from bacteria.

In one of Prof. Bang's cases the dates showed closely that the bacilli had remained present and virulent for at least nine

months in the uterus, in another case five months. The wonderful vitality of this bacillus was shown by placing them in sterilized test tubes. Seven months later the bacilli were found to be alive in these tubes. This explains why a cow that has aborted is very apt to repeat the trouble. Prof. Bang carried on a series of other careful and extensive experiments in which he produced the disease repeatedly by local injections of cultures of this bacillus. His work seems to have demonstrated in a most satisfactory way that infectious abortion depends for its existence upon the presence of virulent abortion bacilli. He not only produced abortion by injecting cultures of the bacillus locally, but also by injecting cultures into the jugular vein. This was demonstrated for ewes and also for the mare.

How Spread.—The contagion is contained in the mucous secretion. Infection may be established by direct contact from animal to animal, or indirectly through litter, wet stable floors, urine, and even attendants. The contagion may apparently be spread in a great variety of ways. To illustrate:

In one case of record, Farmer "A" loaned his bull to Farmer "B," whose cows had been aborting. Although Farmer "A" had not had abortion among his cattle for eleven years, every cow subsequently served by this bull aborted. The infected bull was sold; the cows were disinfected with a solution of lysol, and the outbreak was permanently checked.

In another case the owners are mentioned as A, B, C. "A" had abortion in his herd. In 1897 "A" had sold his bull and used "B's" bull. All of "A's" cows, fifteen, aborted. "B" also loaned his bull to "C." "B" and "C" had never had abortion among their cattle, but in 1898 the disease appeared in both herds. "B" had nine cases and "C" had twelve cases before July, 1898.

In another case on record, two farmers each had about 25 cows. One of these owners had had this disease in his herd for years, while the other did not. However, after a certain season, when both used the same bull, the disease was found in the previously non-infected herd.

It is a very important question to have settled: Whether or not a cow that has once been infected by the infectious type of this disease will continue indefinitely susceptible to reinfection and keep on aborting year after year. There seems to be abundant evidence to justify the conclusion that usually the individual cow develops an acquired immunity after one to three abortions. A very large proportion do not abort more than two or three times before they become insusceptible to this infection. If this be true the cow that has this acquired immunity and has ceased aborting may, under certain conditions, be more valuable for breeding purposes than one that has never aborted. Where the disease continues over a period of several years in a herd, it is usually continued by new cows that are purchased and the heifers that are growing up and coming into the herd as milk cows. The practical point in this is that the outbreak ceases much more quickly if no new animals are added to the herd until a year or two after the disease has appeared.

It is important to remember that infectious abortion is a disease which does not necessarily produce evident symptoms in all cases. A cow may be infected and infectious to others, and yet her calf may be born at or near term and live, and the calf may be a very serious source of infection for pregnant cows. In other words, a calf born from an infected mother, and taken to a healthy stable where the disease has never appeared, may spread the disease as easily, perhaps, as the infected dam or sire, the infection being probably spread by its bowel discharges. It should be remembered in this connection, and this is an important point, that although the cow may become immunized in the course of one to three years, she may continue after that time infectious to other cows, although carrying her own calf to full term and giving birth to an apparently healthy calf. The cow that has once been the victim of infectious abortion may continue to disseminate virulent germs for years. In some respects this is like Texas fever, in that the Southern cows are not apparently ill with the disease, and yet may have the specific

organism present in the blood in large numbers, and transmit the disease to other cows and they die. The apparently healthy cow that has aborted within a few months is usually lost sight of as a source of danger, whereas it should be borne in mind in all the breeding operations, and association of the various animals in the stable, that such a cow may remain dangerous to other susceptible animals of the herd for an uncertain but considerable period.

Prevention.—In a general way the owner should do everything possible to maintain a high level of animal vigor, with careful and oft-repeated disinfection of the contaminating sources. In some cases it is a wise thing to remove pregnant cows from the stable wherein the disease has appeared and keep them in stables that have not been infected.

One observer (Regenbogen) had under observation a stable in which 26 abortions occurred in a herd of 56 cows within some seven or eight months. The carbolic acid treatment in this case seemed to give very satisfactory results. Only one cow in the herd aborted subsequently, and this was one which had not received the treatment. Some other observers have tried this same treatment with very indifferent results.

Another observer records an outbreak that appeared in a stable of 15 cows, 11 aborting in rapid succession. Antiseptic treatment was adopted in the way of external disinfection, and 3 per cent. solution of creolin being used as a wash and injection three times daily. This treatment seemed to be without effect as the disease was not arrested. During the following season the disease reappeared in this same herd, three cows aborting at periods varying from five to seven months. Carbolic acid treatment was then undertaken, 20 grammes of 2 per cent. solution being injected under the skin. The treatment was repeated every two weeks and the same continued for about two and one-half months. All the remaining cows in the herd gave birth to healthy calves at full term.

The following is recorded in the Government "Experiment Station Record," Vol. II, No. 1, page 88; number of cows in

the herd, 24: One drachm of pure carbolic acid given twice a week part of the time, three drachms per week a portion of the time, the acid being dissolved in hot, then diluted with cold water. This treatment began February, 1897. Cases continued to occur until about the first of July. No more cases up to October, 1898, on cows treated. Six heifers at pasture were used as controls in this experiment, not receiving any treatment. All these aborted during this period.

Treatment, with a view to checking a threatened case, should in general be undertaken by a professional veterinarian who has an opportunity to study his patient, and the circumstances of the case. The treatment usually adopted consists of such medicines as tend to allay irritability of the uterus. Preparations of opium and black haw are the ones most commonly used for this purpose. The cow is kept in a quiet place and disturbed as little as possible during the danger period. After urgent symptoms have disappeared, the cow is kept under the influence of these drugs for three or four days more. In dealing with the infectious type of abortion, the line of action is almost necessarily confined to disinfection, with a view to prevent infection of other cows and the continuance of the trouble. After symptoms of abortion have appeared in these infectious cases it is practically impossible to arrest the disease and prevent the abortion.

It seems probable that carbolic acid has some value as a preventive of infectious abortion, but the methods of treatment used by different men have differed so widely and their results have been so contradictory, in some cases remarkable, and in some cases without effect apparently, that it is difficult to find any data upon which to base a satisfactory conclusion as to its value. The owner must not expect to check the disease very quickly if the premises are generally infected when treatment begins.

Getting Rid of the Disease.—The cow which has aborted should be isolated immediately, or in some cases it is better to leave the aborting cow and remove others that are heavily pregnant. The carcass of a calf which is born dead or has soon

died should be burned. If the calf lives it should be kept in a place where its bowel discharges cannot serve as a source of infection. The afterbirth should be burned or most thoroughly disinfected by chemical agents, like carbolic acid. The stall is thoroughly cleaned; bedding, hay, etc., burned; the stall floors, partitions, mangers, etc., disinfected. This in addition to the proper antiseptic treatment of the cow herself.

It seems to be a matter of experience that when cows heavy with calf are placed in an infected stable they often continue full term and give birth to healthy calves and then abort during the next year.

In a herd of considerable size where the cows are valuable and the loss of the calf means quite a serious item, it may be practical to maintain two herds, in separate stables and carefully isolated in every way. This of course involves the use of two sires. The cows in the aborting herd should not be bred again until all discharge ceases.

In case two herds are not maintained, the pregnant cows should be protected by weekly vaginal injections of warm 2 per cent. creolin.

In February, 1897, an owner applied to Prof. Bang for information concerning this disease in his herd. Prof. Bang advised that the bull be disinfected with a one and a half per cent. solution of warm lysol by injecting about a quart of this, with a syringe, into the sheath before and again after service. A year later the owner reported that the disease had disappeared.

Previous to the adoption of this treatment suggested by Prof. Bang the usual preventive measures were carried out with very great pains but without satisfactory results. The aborting cows had been promptly removed, stalls disinfected, the hind quarters disinfected, special milkers appointed, etc., and yet the abortion continued until the adoption of the treatment suggested by Prof. Bang.

In carrying out this treatment there is less resistence if the lysol solution be first warmed. It is also necessary, according to Prof. Bang, to disinfect the uterus of the aborting cow. She

should be promptly removed, isolated, the afterbirth should be removed and destroyed soon after calving, not later than the next day. Disinfection of uterus must be subsequently continued with one-half per cent. lysol. It must also be borne in mind that the germs which cause this disease are scattered generally about the barn on the woodwork and that everything within reach of this infection must be disinfected.

THE "COW'S COLT".—An interesting case of "foster mother" is furnished us by Mr. M. W. Johnson, the Assumption, Ill., horseman. In Mr. Johnson's own language, the case is as follows: "One of my customers, Mr. A. L. Adams, of Moweaqua, Ill., was at my place a few days ago and told me of an occurrence that was so curious I thought you might like to know about it. One of his mares, in the spring of 1901, foaled a filly by Linn Gould, 2:18¼, and had trouble in foaling, so that she became partially paralyzed and could not get up for ten or twelve days. When she did finally get so she could stand she had gone entirely dry and gave no milk for the foal. They started at once to raise the little filly on cow's milk, and she would soon follow them like a dog. One evening when Mr. Adams was milking, the little filly came up and he milked on her nose. She came right on up and took hold of the teat and begun to suck as if she had always done so. After a few trials she took up with the cow and followed her as if she had been her own mother, and with the aid of this strange foster mother grew into a fine big filly. Although she is now nearly two years old and close to 16 hands high, and the cow has been dry for months, she still stays with the cow and will occasionally stop her and pull at her teats, the cow seeming to enjoy it as much as the filly. I will try to have him get a photo of the filly sucking the cow." This is a strange case, and yet it is not a strange case. The young of any species will "love as a mother" that which gives a mother's care and supplies the nutriment required for infantile subsistence and growth, the love for mother coming through the recipiency of motherly care, and not through inheritance of mother's blood. The case at hand is a strong argument for this. It was neither the cow's "shape" nor her "blood relationship" which attracted the filly's devotion, but her motherly care and motherly provisions. Many phases of human existence furnish similar causes for attachment.—(*The Western Horseman, Jan. 1, 1904.*)

AZOTURIA.

By Geo. E. Corwin, Jr., D. V. S., Lakeville, Conn.

Azoturia is a disease of uncertain pathology, varying etiology, never-failing symptoms, and is a disease which has been treated with nearly every drug in the Pharmacopœia.

It has caused as much discussion as Koch and tuberculosis, and it seems to me that most of us are, like Koch, in abusing the disease.

As this malady seems to occur under adverse circumstances, and the majority having different ideas regarding its pathology, I will feel free in expressing my ideas, knowing there is no authority which I am opposing.

Various names have been used to designate this disease, but it does not seem to me that any of them are appropriate, as they have but slight connection with the cause.

"Azoturia," which has been the accepted term, signifies an excess of urea in the urine, which I consider only a symptom or result; as also the nitrogenous condition of the blood.

Why not call it by a name which would seem more appropriate, "*Motor-ataxia-myodynia*," for instance, which would mean, inability to coördinate the muscles properly, with a painful condition of the same; and these conditions necessarily caused by interference with the nerve-function, where I think the pathological lesions primarily exist.

Finding, as we do, this disease developing under almost any condition, whether the animal be in a state of plethora, which is usually the case, or when circumstances are adverse, the following fact would be plainly proven: that the hyper-nitrogenous condition of the blood and urine is *not* necessary to cause it, but merely symptoms.

The most prominent symptoms of this trouble are no doubt well known (sometimes mistaken), namely, loss of power, usually of hind extremities, paralysis of the anus and bladder, great pain, sweating, quick development, and highly-colored thick urine, followed by intense muscular atrophy of the parts; and

post-mortems of fatal cases will usually reveal general destruction of the kidneys.

With these symptoms always present, the way the disease develops, usually following quick violent exertion, debilitating diseases, or after a severe purge has been given (which I have observed in two of my cases), it seems to me to be purely a nervous disorder.

It is a known fact that nerves take the most important part in the metabolism of the body; that the conductivity of nerves is destroyed or diminished by cold, compression, or injury, and that nerves influence nutrition of a part; and the intense muscular atrophy is due to nerve injury.

Suppose this disease develops after an aloes purge, what would be the cause? This, that there has been a sudden metabolism causing a disorder, by whatever means it may be, of the nerves or nervous-centre of the corresponding parts. The conductivity is diminished or destroyed by injury; consequently, pain and loss of power result.

Suppose it occurs in a horse which is plethoric and is violently exercised immediately after standing, we will again have the same condition; sudden and unprepared-for metabolism, causing nerve injury, then loss of conductivity, loss of power, and pain.

There is no doubt in my mind but that some of the nerves which govern locomotion and the action of the organs, liver, kidneys, intestines, bladder and rectum, are paralyzed; perhaps the lumbar portion of the sympathetic system and the lumbosacral plexus are mostly affected.

Therefore, considering the above mentioned facts, I think azoturia is a disease of the nerves.

In treating this disease, I think it unwise to administer purgatives or diuretics, even though you may have had success, for the reason that paralysis usually exists in all of the abdominal organs and that they do more harm than good.

I have used potassium iodide, alternately with potassium bromide, enemas of warm water, and the catheter, also gentle

back-raking with the oiled hand to remove the accumulated fæces, with good results; and in the convalescent stage, tincturæ nuces vomicæ, ℥ij, in aqua, t. i. d.

I may also add that urea is the principal nitrogenous constituent of the urine. It is formed by the actions of the muscles and converted into urea by the action of the liver and removed by the kidneys, and therefore it is necessarily found in the blood and urine, and in great quantities where tissue change has been rapid, as in so-called azoturia.

ANIMAL PROTECTION.—Nothing more strikingly illustrates the bond of sympathy which exists between man and the lower animals than the efforts constantly being put forth in all parts of the world to guard against his suffering in sickness. The following cablegram to the New York *Herald*, of Sunday, Jan. 24, is republished merely as a specimen of many similar ones which we frequently find in the secular press: "The American idea of ambulances for injured horses is becoming popular over here. About a year ago Our Dumb Friend League, which has on its Executive Committee the Marchioness of Donegal, the Countess of Shaftesbury, Lady Brackenburg and Mrs. Haydn Coffin, started an ambulance for injured horses in London, and so beneficial have been the results that another of more improved type was put on the streets this week, and it is further intended to provide every metropolitan borough with such an ambulance, twenty-six being needed to complete the corps. The new ambulance, which was made by a Philadelphia firm, is so constructed that a horse if totally disabled can by means of a winch be speedily hauled in on a platform travelling along two wooden rails. A well known woman has proposed to present the league with a third wagon, and Mrs. Haydn Coffin, with her husband, is organizing a special matinee at the West End Theatre, with the proceeds of which she hopes to be able to provide a fourth. . . . . Another society doing good work in connection with relieving the sufferings of dumb animals is the Dogs' Protection League, which is now taking women probationers who will undergo a thorough course of dog nursing. At the end of the course the canine nurse will undergo examination and will then receive a certificate from the league, which will then, should she pass, send her out to cases the same way as a human nurse. Those who have experienced the weariness of night and day nursing of some old favorite will greatly appreciate the chance of trained help at a moderate figure."

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

HARD FIBROMA OF THE NASAL FOSSA OF A HORSE.

By JOHN J. REPP, V. M. D., University of Pennsylvania, Philadelphia, Pa.

There was brought to my clinic a sorrel driving gelding, 8 years old, to be treated for a diseased tooth. I found that the third and fourth upper molars on the left side were affected by an alveolar periostitis and consequently removed them. The side of the face on which the diseased teeth were was bulged somewhat. This bulging appeared to be due to a rarefying osteitis of the superior maxilla. The horse passed out of observation for a while, but was later returned with the left side of the face very markedly convex, a discharge from the left nostril, and dyspnœa referable to the nasal fossa. Examination showed the left nasal fossa to be completely filled with a tumor mass. The horse was cast for operation. Two openings, one inch apart, were made with a trephine into the nasal fossa just below the eye, and these openings connected by sawing out the intervening piece of bone. Then by means of long handled knives, curette, scissors and forceps the tumor was removed, and along with it the turbinated bones, to which the mass was intimately attached. The affected parts gave off a copious purulent discharge, and were very offensive for about a week, but by free use of potassium permanganate solution and hydrogen dioxide the surfaces were finally made clean and healing begun. The animal improved rapidly and made a good recovery. The large opening made to facilitate removal of the tumor healed surprisingly well and left only a small scar. Within a month the horse was discharged from the hospital cured, except that he made a little noise in breathing. The owner answered my inquiry in regard to the horse nearly a year later by saying: "When I brought the horse home I turned him into pasture and let him run for four months, then I sold him for $70. He was a little thick in the wind at first, but got all right. Last week he was sold for $100."

The tumor had the naked-eye appearance of a fibroma which had undergone calcareous infiltration at some points. It weighed 10 oz. 3 dr. The accompanying picture gives an idea of the

gross appearance of the tumor, although the artist in making the negative did not arrange the fragments in the best possible

manner. Portions of the tumor were fixed in Zenker's fluid and embedded in celloidin. On staining sections by Van Gieson's method I found it to have the typical structure of the hard fibroma.

ENZOÖTIC OPHTHALMIA.

By E. I. Smith, D. V. M., Franklinville, N. Y.

The purpose of this short article is to show what rigid quarantine measures will do, even at close quarters, *i.e.*, if the reader calls the above named disease a strictly microbian one. From my observation I feel very confident that it is.

Monday, Dec. 7, 1903, I was called to a large stock farm supporting a dairy of forty milch cows. Upon arrival I found an underground stable, well kept, whitewashed over the inside and with all other precautions of cleanliness. Temperature in the basement at time of visit 55° F., while outside it was 38° F.

The owner showed me a large cow at the head of her row and called my attention to her eyes. At a glance I observed sore eyes with watery secretions flowing. I then noticed if any others were suffering, and found two more next to her that had the same affection, only milder, being unilateral. The first cow was affected in both eyes. The symptoms in all were a profuse

flow of tears, swelling of both upper and lower lids, marked congestion of the inner aspect of the canthus. The animal would close the eyes if a bright light were brought in contact. If suddenly disturbed or excited a sudden flow of tears would escape. The flow of milk had dropped off about one-third. Temperatures were found to average 104° F. Animals did not refuse to eat and drink, being in excellent condition and fit for beef at the time. Their feed consisted of hay (hill grown) and plenty of ground feed. I inquired if any new additions of stock had recently been made, but there had been none. I immediately ordered isolation to a dark, moderately cool stable, but the owner hesitated, claiming that he did not have the facilities. As a substitute I requested that he partition the place with blankets, darken the window and sprinkle the surroundings freely for several days with a 1–1000 bichloride of mercury solution. I gave each patient 1½ lb. Glauber's salts and left the following prescription:

℞ Acetanilid, ℥i
Pot. nitrat., ℥iv
Misce. Fiat charts No. ix. Sig. — Give one to each affected cow, daily.

I also left a collyrium of corrosive sublimate 1–5000, to be used thoroughly twice daily.

Friday, Dec. 11, revisited case and found temperatures averaging 102.5°F., less flow of tears, but lower hemisphere of cornea began to show an opacity. No further outbreaks had occurred, but requested that the disinfection with $HgCl_2$ be continued. This time I prescribed half-ounce doses of pot. nitrate and a wash of boric acid, 1–100, made up with aqua pluvialis, to be used twice daily, and at the same time to syringe (syringe previously boiled) the collyrium into the inner surface of the lids.

Tuesday, Dec. 15, revisited the case and found no further outbreaks and a complete recovery of the ailing ones except one cow in one eye had marked opacity of the cornea and was partially blind in the same.

Dec. 27 I had an occasion to visit the herd, and my attention was called to the fact that the cows had wholly recovered, and upon observation I found that the opacities that previously existed had disappeared, leaving the cornea perfectly clear and normal in appearance.

MANY interesting and valuable articles are held over this month on account of lack of space.

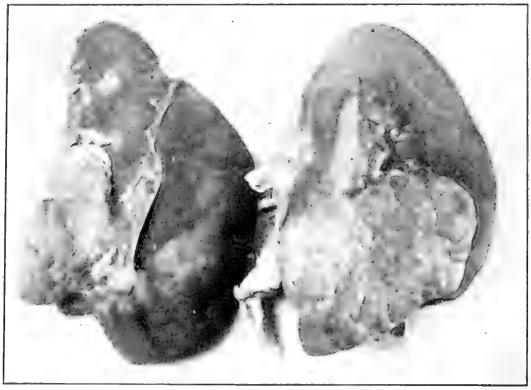
ADENO-CARCINOMA OF THE KIDNEY OF A HOG.

By JOHN J. REPP, V. M. D., University of Pennsylvania, Philadelphia, Pennsylvania.

I happened to visit Dr. T. A. Shipley, Chief Inspector at the Sinclair Packing House in Cedar Rapids, Iowa, on the day that he had taken from a hog in the course of his inspection of carcasses at the abattoir, a kidney which was the seat of a tumor. He showed the kidney to me, but, as neither of us could say definitely what the tumor was, he kindly allowed me to take it to my laboratory for identification.

On making microscopic sections from the tumor and properly fixing, embedding and staining them I found it to be an adeno-carcinoma.

The following illustration will give a very good idea of the gross appearance of the tumor on both the natural surface and the surface of section.



The tumor occupies the greater part of one end of the kidney, displacing the medulla and encroaching upon the cortex and causing it to undergo atrophy, so that in some places it has entirely disappeared. On the natural surface in the region of the pelvis are a number of nodular masses which stand out prominently from the main mass of the tumor, and, being translucent, appear on casual examination much like hydatid cysts.

The tumor is of medium consistency and of whitish color. It is not encapsulated, but is sharply circumscribed, as will be seen by examination of the illustration. There was no evidence of metastasis, all the other organs being healthy. The tumor was primary in the kidney.

A CASE OF FÆCAL IMPACTION OF LONG DURATION.

By EDWARD F. KOEHLER, D. V. S., Easton, Pa.

A similar case to the one reported in "German Review" in the January REVIEW, occurred in my practice.

A black gelding, aged about 20 years, was taken with pain, pawing, rolling, looking into the flanks, raising of one hind leg, frequent urination, pulse and temperature normal. Gave anodynes, but no relief, followed with 1½ pints of raw linseed oil; three days after pains subsided, followed by a passage from the bowels; 24 hours after the pain returned; rectal injections were administered, but no food passed with its discharge; later, rectal explorations, but there was an empty rectum; the pain continued for three weeks without any more passages from the bowels. Advised owner to destroy him.

The post-mortem revealed the stomach and small intestines normal, but the cæcum and large colon were over-distended with dry, partly digested food. At the termination of the large colon and the beginning of the floating colon there was impacted tightly a dry, undigested mass of food which prevented a further movement, the rest of the colon and rectum being entirely empty.

No inflammation having existed, and the appetite being good, the question is, how long might he have suffered until he died?

SUCCESSFUL TREATMENT FOR RHEUMATISM.

By H. M. STEVENSON, V. S., Perry, Iowa.

A gelding, 12 years old, weight about 1300 lbs., had been lame for about eight weeks, first in one leg and then in the other. When I saw the animal the left fore limb was swollen and very painful to the touch, and could not step over a six-inch sill, and I diagnosed the trouble as acute rheumatism.

Treatment.—First I took one gallon of blood from the jugular and injected one gallon ½% solution of chloride of sodium, repeated next day, and in five days owner was plowing with the horse, and there has been no relapse.

EXTRACTS FROM EXCHANGES.

FRENCH REVIEW.

By Prof. A. Liautard, M. D., V. M.

Unilateral Facial Paralysis due to Cauterization at the Origin of the Subzygomatic Plexus [*M. Leon Dupas*].—This case is rather unusual as far as the traumatic cause which gave rise to it is concerned. A four-year-old colt became affected with strangles. Abscesses of the intermaxillary space formed and were evacuated, and later on each side of the throat, under the parotids, manifestations of others in formation were evident by the presence of swellings, hot and very painful, which interfered with the motion of the head on the neck and made mastication difficult. After a couple of days, that of the right gave indications of deep fluctuation and was punctured with a hot pointed actual cautery, which had to be introduced about three centimetres deep before a small quantity of thick creamy pus could be allowed to escape. The next day the countenance of the animal was surprisingly changed. Looking at him full face, the nose and lips were drawn to the left, the right half of the lower lip was hanging, flabby and exposing to view the teeth and gums; the right nostril was small by the dropping of its internal wing. Looked at in profile, the labial commissure of the right side was widely open, free from wrinkles, while on the left side there were wrinkles more apparent than in normal condition and more close to each other. The diagnosis is positive. The animal's prehension of food, liquid and solid, was exceedingly difficult, but after a few days the horse seemed to learn how to make the best of his condition and eat and drank comparatively well. After a month a certain improvement seemed to occur, but yet, notwithstanding all kinds of treatment, the condition after three months had remained almost the same. As sequelæ of the facial hemiplegia, the animal contracted the habit of allowing his tongue to protrude out of the mouth, a condition which gave a still more peculiar aspect to his deformed physiognomy.—(*Rec. de Med. Vet., Oct., 1903.*)

A Few Peculiar Facts Observed During an Inspection of Horses [*M. Dupas, Army Veterinarian*].—1. *A Bandy-legged Horse*, whose left forearm was longer than the right, and

therefore the knee was lower. This abnormality was corrected by a defectuous standing of the leg and the deviation of the foot inward. Notwithstanding this condition, the horse did good service. 2. *A Hunchback Mare*, carrying an enormous gibbosity involving the back and the loins. Cyphosis without scoliosis. 3. *Horned Horse.*—Two bony eminences, rudiments of horns, situated on a level with the orbital arches and symmetrical on each side of the median line. These elevations measured 2 centimetres in height. 5. *Wooled Horse.*—A horse from Britany whose whole body was covered with undulated, curly hairs, from 10 to 30 centimetres in length. 6. *Mares with Tusks.*—During this inspection, the author has met with between 25 to 30 per cent. of mares with tusks more or less developed. In some localities, the abnormality was so common that it would have been risky to judge of the sex of the animals by merely the examination of the mouths.—(*Rec. de Med. Vet., Sept., 1903.*)

CASTRATION OF HORSES WITH THE EMASCULATOR [*E. Marchal*].—Referring to this mode of castration, which has recently entered the domain of French surgery, and to which Prof. Cadiot makes allusion in his late work, the author makes a few remarks upon the different manners he has resorted to in his practice. By his special position he has a number of horses to castrate yearly. At first he resorted to the *clamps*, by the method of covered cord and covered testicle. With its advantages it has many objections, viz., pulling on the cord, irritation of the gaping wounds, requiring a second operation for the removal of the clamps, etc. 44 days are required for the recovery. *Limited torsion* is a good method, yet it has also its risks, viz., hæmorrhages and intestinal prolapsus. In 127 horses which he castrated that way, the average duration for cicatrization has been 19 days. With the *emasculator* he operates also by covered cord and testicle. With it he has had six hæmorrhages out of 101 operations he has performed. With this instrument he does not hesitate to operate on horses of any age; he has castrated one of 16 years without accident or complication. For him this method does away with colics after operation, hæmorrhages, hernias, scirrhous cords, etc., and it possesses all the other qualities of the other methods. An animal can be cast, secured, operated and let loose in six minutes. The average time for the cicatrization out of 101 animals operated has been 16 days. —(*Rec. de Med. Vet., Oct., 1903.*) [In the United States the emasculator is rapidly superceding the ecraseur, which held

sway for many years. Veterinarians in the breeding districts have stated to me that there is less risk with it than with any other method. Most American castrators now perform the operation in the standing posture, and many are very expert and rapid, having the testicles removed in half the time that would be required in adjusting hobbles—one or two minutes being sufficient time. For castration in the standing position the emasculator is especially well suited.—R. R. B.]

TETANUS IN THE DOG [*Ph. Gueyron*].—This affection is rarely observed in the dog. During 20 years of clinical practice Cadéac has seen but one case. Möller, in Germany, claims that out of 50,000 sick dogs there is in the average only one which is affected with tetanus. A few cases have been recorded by French veterinarians. Lately a case was related in a German paper by a veterinarian. A dog, in which the extremity of the tail had been amputated, had an extensive hæmorrhage, which had required the application of a ligature around the end of the tail. Eight days after the animal refused eating, and as he had necrosis of one of the caudal vertebræ the tail was a second time amputated. Two days later the symptoms of tetanus were well marked and the dog was killed. In February, 1901, the author was called to remove a tumor situated on the left side of the chest of a Gordon setter slut. The growth was well pedunculated, and, to avoid hæmorrhage, an elastic ligature was applied on the peduncle of the tumor. This fell off after eight days and left a small granulating wound. A few days after the dog showed stiffness of the dorsal muscles and other symptoms of tetanus, which, notwithstanding cauterization of the wound of the peduncle and injections of morphine, and of chloral, made rapid progress and carried off the dog in four days.—(*Prog. Veter., Oct., 1903.*)

HISTORY OF A RING [*E. Pion*].—In one of his chronicles, the author relates the queer history of a foreign body, which was told to him by another veterinarian, as follows: One day a horse having a large abscess of the thigh near the stifle, was presented to him. It had to be opened, which was done in the classical way, with a bistoury, followed by the introduction of the fingers to carefully tear the bands which might possibly be there. When the pouch was well emptied, the veterinarian went away to see another patient, where he was kept for a good half hour in firing him. When the operation was finished he observed for the first time that his ring was not on his finger. He went back to his first patient, looked in the bedding, every-

where ; no ring was to be found. Three months after he was called again to see the horse with the abscess. The enlargement had disappeared ; the horse was not lame, but he had a fistula, which was very troublesome, always discharging and rebellious to all treatment. The tract of the fistula was probed, a hard substance felt at the bottom ; a slip of the bistoury, and the bague found. Moral, says Pion : Take off your ring when you operate *in corpore animalium.*—(*Semaine Vet., Sept., 1903.*)

Periodic Ophthalmia of Horses—Its Microbian Nature—Treatment [*E. Aureggio*].—After referring to the investigations which he had carried out in 1899 at the Veterinary School of Lyon, with others, the author relates how, after the operation of iridectomy on a mare affected with periodic ophthalmia, the piece of iris was kept in a liquid, and a few hours after two drops of the same liquid injected into the eye of a rabbit, gave him an experimental affection. The same result was obtained with other rabbits, and even on horses. Following the researches upon the pathogenous agent, it was finally discovered that it was a staphylococcus, having much analogy with the *Staphylococcus pyogenes aureus.* Later on, a committee was appointed to inquire into the proper treatment which might be followed, and the result of the inquiry was that the use of iodide of potassium internally and externally would give the desired effect. The proposed treatment is to administer the iodide by the mouth in increasing doses, from 20 to 30 grammes daily, and to apply over the eye compresses moist with a solution of the iodide 1:100. Periorbital injections can also be resorted to with advantage. The treatment has already been employed by several army veterinarians and recoveries have been obtained by them in a few days. It seems that the therapy with iodide has already given very good results in Germany also. In some cases relapses have been removed by large doses of the drug.—(*Progres Veter., Nov., 1903.*)

Old Diaphragmatic Hernia [*M. Morel*].—After having exhibited severe symptoms of colic, on different occasions, the horse died. In the last attacks he had shown more or less depression, moaned a great deal, and exhibited alternately marks of great depression, which were followed by violent excitation, etc. One day he had a severe fall and struck heavily on the ground ; his abdomen then became hard and painful ; the temperature varied ; his breathing was strictly pectoral ; the flanks were immobile ; percussion of the chest indicated submatity. At the post-mortem two classes of lesions were found.

First, an old laceration of the diaphragm, with sclerosed borders, through which the stomach and a portion of the small intestine have passed. Second, a laceration of the stomach, with food in the peritoneal and pleural cavities. The old diaphragmatic hernia gave rise during life only to repeated attacks of colic, but yet the well-marked lesions of the peritonitis and pleurisy, of septic nature, seemed well to indicate that the laceration of the stomach existed at least several days before death.—(*Journ. de Zoötech. and Rev. Gen., Nov., 1903.*)

INTERNAL MEDICATION IN OSTITIS DE FATIGUE AND SPRAINS OF TENDONS [*G. Joly*].—A long experience has shown the author that in saddle horses, antifebrine in doses of 20 to 25 grammes morning and evening, emetic in 10 gramme doses, arecoline (5 grammes), eserine (5 centigrams), pilocarpine (10 centig.), in subcutaneous injections, can (no doubt as vaso-constrictors) produce a rapid disparition of the symptom *heat* in diseased extremities, and even in its place give rise to a sensation of cadaveric cold. Then, all those drugs can be utilized in all the cases of ostitis de fatigue : *laminitis, exostosis, splints, osteo-arthritis of the knee, of the hock, vetebral ostitis*, and also in *chronic sprains of tendons and ligaments*. Animals react in very different manner with each of these vaso-constrictors. In a few days, however, one soon decides of the action of, say, antifebrine on this or that subject. If there is no cooling manifested in the leg, another agent must be tried. Arecoline is practical in veterinary hospitals. Antifebrine can be applied by the clients themselves.—(*Rev. Gen., Nov., 1903.*)

DUTCH REVIEW.

By L. VAN ES, M. D., V. S., Agricultural College, North Dakota.

PANCREON IN THE TREATMENT OF SCOURS IN YOUNG CALVES.—As the name indicates, pancreon is a pancreas preparation. In human therapy it has been used with good results in diabetes mellitus and in chronic intestinal disorders. Under the name of pancreon B, a preparation especially designed for veterinary purposes, has been placed on the market. It seems that in scours of new-born calves this article is especially indicated. While in this disease hygienic measures are usually more useful than any other, the difficulty of having those carried out by breeders is responsible for numerous losses. For

this reason, a remedy which reduces the mortality will be quite welcome. As soon as the disease makes its appearance two tablets of pancreon are given. This is repeated three times a day, or in severe cases four times. This treatment is continued for two or three days. In the cases treated the fæces became normal, the appetite and vitality returned. For experimental purposes the remedy was placed in the hands of 76 breeders. Of those 56 had occasion to use it. In 77 calves it was used as a preventive, and in 253 calves it was given after the disease had made its appearance. The total loss was 18 head, in six of which there was a probability of other causes being at work. The beneficial action of the drug is attributed to its stimulating effect on digestion and assimilation, by which the natural power of resistance is so increased that the bacterial invasion can be successfully met. It is pointed out that in scours in calves the hygienic measures recommended by Poels must be given a first place, but that pancreon may prove to be a valuable accessory in its management.—(*K. de Vink, in Tijdschrift voor Veeartsenijkunde.*)

EXTENSIVE DILATATION OF THE ŒSOPHAGUS IN A COLT.—In most cases of dilatation this is brought about by stricture or stenosis. The case here described is remarkable by the absence of any diminution of the lumen below the dilated portion, the condition evidently being due to a primary, partial paralysis. The patient, a 4½-months-old stud colt, was presented for treatment on account of a swollen throat and because it slabbered a great deal and could not eat. The animal was poorly developed, was lifeless, weak, and had a dull coat. It kept its neck protruded while a dirty green saliva driveled from its mouth. The lower edge of the neck was thickened over its whole extent by a thick cord-like, doughy swelling in such a manner that the trachea was displaced toward the right side. The conjunctiva was pale, the nasal mucosa injected and dirty, pulse weak, respiration normal, temperature 38.5 C. The animal seemed to be hungry, masticated its food, but was unable to swallow. Drinking was impossible, the water regurgitating through the nose. A probang could not be pushed beyond the thoracic portion. The history of the case shows that the colt was weaned 5 weeks before and that it had presented symptoms of the present condition about one week afterward. A diagnosis of a food accumulation in a very much dilated œsophagus was not difficult. The prognosis was very unfavorable, and no treatment was attempted. The patient died 5 days afterward. The autopsy showed that the

œsophagus from the pharynx to 15 c.m. from the diaphragm was very much dilated, having the appearance of a large sausage. At the location mentioned it abruptly narrowed to its normal size. Although no sign of respiratory trouble was shown during life the lungs were found to be inflamed and food particles were found in the bronchia. On opening the œsophagus it was found to be stuffed with food, pressed into a hard cylinder which protruded with a little tip in the healthy portion of the œsophagus. The wall of the dilated portion was very thin, the muscle coat atrophic, while the mucosa had disappeared or had remained attached to the mass of food. The lumen of the dilated portion measured 20 c.m. in circumference. With the exception of the large intestines, the digestive organs were empty. The conclusion was made, 1st, that the condition arose from a paralysis, partial and primary; 2d, that the trouble was congenital as it dated from the time when the colt was compelled to take large quantities of solid food. Death seemed to be due to inanition.—(*M. Van der Vliet, in Tijdschrift voor Veeartsenijkunde.*)

WHAT IT COST TO EXTERMINATE FOOT-AND-MOUTH DISEASE.—In the Report of the Secretary of Agriculture, issued Dec. 1, 1903, the final figures are given regarding the recent unexampled campaign against this disease by the Bureau of Animal Industry. To those who appreciate the great danger to which this country was exposed through the presence of this highly contagious disease, the wisdom, the energy, and the success of the undertaking reflect the greatest credit upon the Secretary for his broad-minded and prompt action, while we all applaud and admire the heroic work of Chief Salmon and his assistants in devising and carrying into operation the effective measures which have saved the country from one of the greatest of modern pestilences. Operations were begun December 1, 1902, and the last diseased herd was slaughtered May 9, 1903. The number of animals slaughtered was 4,461, of which 3,872 were cattle and the rest hogs, sheep, and goats. The Department allotted 70 per cent. of the appraised value as indemnity, and the amount thus paid was $128,908.57. Including all the other expenses, the Secretary estimates the total cost of the eradication of the disease at less than $300,000. A general extension of the contagion over the country would have caused cattle raisers direct losses aggregating hundreds of millions of dollars, while indirect losses from restrictions on traffic and embargoes on our export trade would have been simply incalculable.

REVIEW OF BIOLOGY.

ON THE TUBERCULOUS INFECTION OF DOG THROUGH THE DIGESTIVE CANAL [*Fernand Arloing*].—The attempts at infection through the alimentary canal which have been made in cattle, goats, sheep, swine, rabbits and guinea-pigs are numerous. The same trials made in dogs are comparatively very few. Among those can be mentioned only those of Gunther, Harms, Bollinger and more recently those of Ravenel, made on two young dogs which had been fed with milk containing human bacilli. One of the dogs died in 57 days with tuberculosis, generalized principally to the lungs and liver; the other, killed after 85 days, showed a few caseous nodules in the lungs, the parotid and mesenteric lymphatic glands. There were no intestinal lesions in either. Ingestion of bovine tuberculosis in two other dogs gave about similar positive lesions. Mr. Arloing reports seven experiments in which the dogs were made to take emulsions of human tuberculosis in different ways, and from those experiments makes the following conclusions: (1) Ingestion of human tuberculous bacilli has been followed by infection of the intestinal canal of the dog 3 times out of 7; (2) The changes of the chemical gastric contents or the alterations of the stomach envelops have not promoted the local infection; (3) Twice the tuberculosis started in the intestines, has become generalized, and tubercles were found in the spleen and in the lungs; (4) Twice also, with the absence of any macroscopic and microscopic lesion of the gastro-intestinal tract, the peri-gastric glands have been found tuberculous by the microscope; (5) These last show once more that the bacilli of tuberculosis may make their way through the healthy intestinal mucous membrane without leaving marks of their passage and afterward infect, with time, all the organism; (6) One must consequently be cautious when designating the door of entrance of pulmonary tuberculosis, as the absence of intestinal lesions does not exclude the suspicion of primary digestive origin of the tuberculous infection.—(*Soc. of Biol., April, 1903.*)

UPON THE ACTION OF TICKS IN OVINE PIROPLASMA OR CARCEAG [*M. Motas*].—In a previous communication, the author had said that he has transmitted carceag to four lambs in putting on their wool ticks taken from sheep already infected. Mr. Mequin had made objections on the possibility of such transmission, because fecundated females only suck blood, and

when once gorged, unable to go on another subject, they allow themselves to drop on the ground, where they lay their eggs and die. Mr. Motas observes that he did not resort to ticks gorged with blood, but that he deposited on his lambs adult ticks, sexed and not gorged with blood. He then reports the experiments that he has made to define the action of the tick (*Rhipicephalus bursa*) in the transmission of carceag, and establish the various stages of its evolution. His conclusions are: (1) The larvæ and nymphoes of the *R. bursa*, even those born of mothers gorged with blood of diseased sheep, are unable to transmit the disease to healthy sheep upon which they are deposited; (2) the (sexed) adult tick alone seems capable to give the disease; (3) eggs from ticks gorged with blood of diseased sheep contain the specific hematozoœ, which has to pass through a certain evolution, yet unknown, during the various stages of development of the tick. There is an evolutive parasitic circle between the sheep and the *R. bursa*, which insures the transmission of the disease.—(*Soc. de Biol.*, *April*, *1903*.)

Mechanism of Death Following the Entrance of Air in the Veins [*Chr. A. François-Franck*].—An important quantity of air, entering into veins, collects first in the right auricle and ventricle. It distends them, mixes with the blood and is pushed by the right ventricle into the pulmonary artery, while it is at the same time pushed back in the veins. The foaming blood, pushed back in the veins, goes to impregnate the encephalic nervous centres and promote in them peculiar conditions. At the same time, the air, mixed with the blood, is pushed back in the cardiac coronary veins. It passes almost entirely through the pulmonary network. Brought back to the left cardiac cavities, the bloody and airian mass is thrown into the aorta and among others goes to obstruct the superior encephalic and medullary capillaries, while, on the other hand, the small veins are filled with an identical spumous fluid; the suppression of the arterio-venous current in the nervous centres is also followed by acute cerebral nervous anæmia. But death of the heart is the consequence of the direct penetration of bubbles of air in the coronary arteries. Myocardiac anæmia follows and the heart dies, exactly as if it was under the effect produced by the ligature of both carotids.—(*Soc. de Biol.*, *July*, *1903*.)

Three Veterinarians took the State examination at Trenton, Jan. 22 and 23, for license to practice in New Jersey.

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

DR. NOCKOLDS' RECENT LETTER IN THE REVIEW.

FORT ASSINABOINE, MONT., Jan. 16, 1904.

Editors American Veterinary Review:

DEAR SIRS:—In the "A. V. D." of your January issue you publish a letter from Dr. C. Nockolds, 1st Cavalry, in which he states that he has been away on a four months' leave in Europe *and England*, and has been unable to keep up with current events at home.

Nevertheless, the good doctor jumps lightly at the conclusion that "the only correct way for the army veterinarian is to obtain a commission if only as a second lieutenant." "I believe," he says further, "that the veterinarian would be better off as a second lieutenant at half pay than with double pay and no rank."

If these utterances of Dr. Nockolds are taken literally, I, for one, am very willing to let him have a commission as a 2d lieutenant with $62.50 monthly pay, but I would prefer $250 per month and the present rank. I am certainly not a worshipper of the dollar, nor do I have any objection against a commission. But a commission as a 2d lieutenant is the lowest in rank, carrying with it so little more rights and privileges than the rank conferred upon us by authority of the War Department. And if his proposition was intended merely as a joke, I believe that the question before us is too serious to be settled by such a flippant remark. It is gratifying to know that we have a younger man in the army service who is willing and fearless enough to express his views in writing, but this should not be done at the expense of a thorough investigation of the subject and careful conclusion. As far as army veterinary matters are concerned the doctor is evidently not yet well informed.

In the meantime, our petition has gone forth asking for the commission of a second and first lieutenancy. I have signed it with reluctance, because it asks for no organization, without which we can never develop professionally in the Army; because it is explained solely by arguments for a personal betterment of our position almost pitiful in its appeal, whereas we should have come out with our just claims based upon a neglected veterinary service that is a disgrace to an educated army; and finally, because it contains an exceptional provision that surrenders it to methods of ordinary politics. I shall never again sign a similar document unless it is strong in its just claims for the establishment of an organized army veterinary service and morally clean from any exceptional legislation. I have done so this time because I wanted to obey the wish of the majority, and because I did not want to endanger its passage by a minority report without the previous knowledge of my army colleagues.

OLOF SCHWARZKOPF.

* * *

Veterinary Hospitals for the Army.—The following order has been issued by the War Department:

"A board of officers to consist of Capt. Thomas H. Slavens, Q.M.; Capt. Howard R. Hickok, 15th Cav.; Capt. Charles P. Summerall, A.C.; Veterinarian Walter R. Grutzman, 15th Cav., is appointed to meet at Fort Myer, Va., to take into consideration the preparation of plans, specifications, and estimates of cost of construction of suitable buildings, with their equipments, for the care and treatment of sick public animals at posts where they may be found necessary." (Jan. 4, W.D.)

With the exception of Fort Riley, Kansas, there are very few Cavalry Army Posts that have any provision whatever in the way of veterinary hospitals. Most of our large Cavalry Posts have from six to eight and more large stables containing between 600–800 horses and mules, yet there is no provision for a suitable place to operate during icy cold or otherwise inclement weather, not to speak of the absence of any arrangements to sling horses, etc. While it is very true, as pointed out by some officers, that the army veterinarian ought to get used to do operations and treat wounded and sick horses on any spot and under any weather in the field, where he can have no facilities as are accorded in hospitals, yet it is cruel and wanton not to properly provide for up-to-date treatment while the horses are in the garrison. Besides it is poor economy. Of late the subject has been brought forcibly forward in reports by army veteri-

narians to the Quartermaster's Department, and we are pleased to know that the arguments and suggestions have not been made in vain, and that at least a beginning has been made in the above appointment of a board of officers to consider the matter officially. (O. S.)

* * *

A Bill for Breeding Army Horses.—"H. R. 8338, Mr. McCreary.—To provide for the improvement in breeding of horses for general purposes, and to enable the United States to procure better remounts for the Cavalry and Artillery service. The bill directs the Secretary of War 'to designate three officers of the Regular Army on the retired list from the Cavalry, Artillery and Infantry services,' who, together with twelve practical horse breeders, to be selected by the Secretary of Agriculture, shall constitute a commission to inspect stallions and mares to be used for breeding. The President is to designate one member as president of the commission, who is to appoint the secretary, to whom a salary of $2,500 is to be paid, the other members of the commission to receive only actual expenses. A fee of five dollars is to be charged for registering horses and three dollars for mares, the owners agreeing that the registered stallions shall serve the registered mares for a fee to be fixed by the commission. The country is to be divided into five or more geographical districts and registered animals shown at fairs or exhibitions are to be judged only by judges who shall be members of the commission created by this bill. Sec. 6. That the United States shall have the right to call upon the breeders, who shall have taken advantage of the provisions of this act to furnish for the use of the United States such registered horses, over four and under eight years of age (excluding stallions and mares actually in use in breeding), as said owners may have in their possession when the said call may be made: Provided, however, That the United States shall pay to the owner for every such horse so taken for public use such sum as shall be fair indemnity to the owner for the reasonable value of his animal so taken, the commission to be appointed under this act, or a committee of three of its members, to determine the value of the horse and to make award for the payment of the money equivalent therefor to the owner by the United States. Sec. 8. That the registry fees provided for in Sec. 4 of this act shall be covered into the Treasury of the United States as other miscellaneous revenues."

This is the second time that this bill has been introduced

into Congress. Although largely fashioned after the pattern of some European laws, some of which have been in force for nearly one hundred years, and have more or less solved the difficult question of providing for suitably bred horses for the armies of Continental Europe, it is all right in its way even for the United States. At present the U. S. Army is certainly confronted with the serious problem of how to procure proper cavalry horses, as they seem to have vanished from our country. But there is one omission in this bill, that will work as a boomerang if not corrected in time, and that is the absence of a provision for army veterinarians to be members of this commission. It is a pity that we have no chief veterinarian of the army, who can look after this bill, and have it corrected before such patch-work of a bill becomes a law. (O. S.)

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ARMY VETERINARY DEPARTMENT NOTES.

Samuel Glasson, Jr., D. V. S., Vet. 9th U. S. Cavalry, spent August, September and October in the Yosemite National Park, and is back again in the General Hospital at Presidio, San Francisco, suffering from his old complaint (chronic amœbic dysentery).

Dr. Lawrence, 5th Cavalry, had his left leg amputated (hip-joint operation) on Dec. 28, at the Army General Hospital, San Francisco. He was injured while playing polo in the Philippines, and osteomyelitis developed.

Dr. W. H. McKinney, formerly of Geneseo, Ill., has been appointed army meat inspector, Quartermaster's Department, U. S. Army, at the Union Stock Yards, Chicago.

"SPECIAL REPORT ON THE DISEASES OF THE HORSE."—We acknowledge our indebtedness to the Chief of the Bureau of Animal Industry for a copy of the new edition of this excellent document, which has been revised and a number of new chapters added by well-known American veterinarians. A full review of the "Report" was published in these pages several months ago, giving details of the revision and the additions. The quantity as authorized by the last Congress was 300,000 copies, but the Department of Agriculture is not entrusted with their distribution, Representatives and Senators being assigned almost the entire edition. Therefore veterinarians wishing to secure a copy (and every one should possess one) must apply to their Representative or Senator.

CORRESPONDENCE.

BULLETIN 41 OF THE BUREAU OF ANIMAL INDUSTRY.

PROSPECT, OHIO, Dec. 30, 1903.

Editors American Veterinary Review:

DEAR SIRS:—In a recent communication made elsewhere, I alluded to the fact that the Bureau of Animal Industry, under Dr. D. E. Salmon, is working with the wrong germ as regards their so-called hog cholera, swine plague, contagious pneumonia, otherwise and more properly called swine fever. Then, as well as now, I had, and have no desire to detract one iota from the valuable scientific research otherwise rendered by Dr. Salmon and his staff.

Very recently I perused with great care Bulletin 41 of the Bureau of Animal Industry, viz.: A form of hog cholera not caused by the hog cholera bacillus. Circular 41 is simply a confession that the Bureau is "up a tree," and the writer's former assertion that the Bureau is working with the wrong germ is more than ever a fact.

The writer was formerly an orthodox believer and supporter of the side taken by Dr. Salmon; that is, he believed in the presence of separate producing germs for hog cholera and swine plague; but since the writer has used the antitoxin originated by Dr. DeVaux, which is made from an encapsulated basic germ, and has proven itself a positive preventive and very large curative agent of what the Bureau calls hog cholera, swine plague, contagious pneumonia, and Bulletin-41 disease, this orthodox belief in the existence of individual germs has necessarily been shattered, and as far as the writer is concerned the above antitoxin has proven that there is only one germ as the basic cause of these several so-called diseases, and that is the encapsulated germ of DeVaux. Last year, either in June or July, I sent the Bureau some tissues of two 30-40-pound pigs from Portland, Mich., belonging to a Mr. Francis. These were sent because I wanted a confirmation of the existence of hog cholera. The Bureau very kindly made an examination and informed me in due time of the fact that no hog cholera germs were to be found in those tissues. All but a few of these pigs died subsequently with swine fever. There was soon after a generalized outbreak of swine fever in that section, and it was the most extensive and malignant outbreak the writer has ever seen. It might be well to state that the pigs of Mr. Francis were about the first ones in that terri-

tory to be affected with the disease. In this outbreak the antitoxin was used extensively, proving a positive preventive and reliable curative agent. The fact that the Bureau of Animal Industry finds it difficult or at times impossible to produce cholera, as they term it, by inoculation with their germ, and the fact that their immunization results are practically negative, is so far reasonable proof that they are working with the wrong germ, as the reproduction of the disease by the introduction of the supposed cause presents unimpeachable proof of a certainty of such cause.

On the other hand, no such difficulty exists with the encapsulated germ found by DeVaux. It promptly produces the disease and its antitoxin is preventive and certainly will cure all those which are curable. Bulletin 41 announces the discovery of a new and highly contagious disease among swine, calling it a form of hog cholera. The post-mortem examinations are the same as in their genuine hog cholera, only the hog cholera germ is wanting, but it so happens that the germ is there all right, only the Bureau has not found it, and that germ is the one discovered by DeVaux.

In support of the above, a great mass of clinical material has been accumulated by the writer, which will be produced whenever the necessity arises. It seems that the time is ripe were either the efficiency or the inefficiency of the serum under discussion, and should be publicly settled, as well as the causative germ or germs, a proposition of vital importance to the practicing veterinarian and certainly so to the stock owner.

Here is a problem for the American Veterinary Association to settle, which association has endeared itself to every veterinarian of a progressive spirit. Let a representative body of veterinarians address the originator of this antitoxin, have a reasonable number of hogs immunized, then exposed to the hog cholera, swine plague, contagious pneumonia, Bulletin-41 disease of the Bureau of Animal Industry, and watch the results, as so far the Bureau either cannot or will not settle this point. It is to be hoped that this question of national interest will appeal to the American Veterinary Medical Association and that they will take it up. W. E. A. WYMAN.

DR. W. H. DALRYMPLE WRITES A NEWSY LETTER ON MANY SUBJECTS.

We fear we are violating the proprieties in publishing extracts from private correspondence, but there is so much wisdom

in a letter received from Dr. Dalrymple, of the Department of Veterinary Science of the Louisiana State University and Agricultural and Mechanical College, dated Dec. 28, that we subjoin the entire epistle, with the omission only of some personal pleasantries:

". . . . I had the pleasure of attending the late International Live Stock Exposition at Chicago, and had two students of our agricultural course accompany me, as a matter of educational interest to them in live-stock husbandry. While in the 'Windy City,' I had the good fortune to be able to attend a couple of the sessions of the Illinois State Veterinary Medical Society, which was quite enjoyable to myself as well as the young men I had with me. It was an opportunity for the latter to come in contact with representative members of the profession, and probably deepen their impressions with regard to the value of veterinary medicine. Dr. Salmon made a most interesting address along the line of the scope of the profession in different branches of work, which ought to have proved very encouraging to his auditors, and which I know was very much appreciated by my little 'crowd.' There was a short paper presented which was a report of an outbreak of anthrax in the State of Illinois. I was rather amused, from a Southern standpoint, at the length of the discussion. After a question or two was asked by one of the members, it was moved that the discussion be closed. I thought to myself, if that had been down our way, we would have had a few more queries to put to the essayist, wise or otherwise, before the subject was dropped. Of course, I understand this is a matter of much lesser interest to the members of the profession in that section of the country than to us. Still, at the same time, I rather think that anthrax is becoming more widespread than formerly, or it is being more frequently identified, and should, in consequence, be given a little more time to its more thorough discussion whenever it comes up. There was a point which impressed me rather forcibly, viz., with reference to holding autopsies on anthrax cadavers, which, under ordinary circumstances, I think is to be deprecated. If I mistake not, a post-mortem was held on each of the animals that died in the outbreak referred to—probably six or eight, if I remember correctly. Of course, if cremation is strictly and carefully carried out, the danger is reduced to the minimum; but if not, there is great danger in furthering the spread of infection through spilling of the germ-laden blood. Unfortunately we do not all possess micro-

scopes, nor are we all versed in inoculation methods. But it occurs to me that both are accessible, especially in States having Live-stock Sanitary Boards, or Boards of Health, and ought to be taken advantage of to the exclusion of the dangerous post-mortem system in the case of such a readily distributed disease as anthrax. The reason for its out-cropping in hitherto apparently non-infected sections of the country, I cannot say, except that the distribution and utilization of commercial feeds being much greater than formerly may have something to do with it in some cases. I have had personal experience with at least two outbreaks, the spores of the disease being evidently introduced in this way. Of course, in such a case, the grains used must, most probably, have been raised on some anthrax-infected area; and it is no new thing across 'the pond' for outbreaks to occur through the intermediation of food stuffs imported from foreign countries infected with anthrax. However, I must call a halt or you will get the impression that I am writing for publication.

"The next day or two will decide whether or not I start for the annual meeting of the National Live Stock Association to be held in Portland, Oregon. As I think you are aware, I am a member of the Executive Committee, and also of the Committee on Sanitary Measures, and of course would like to attend. But the distance is so great, and the time of year rather inopportune, that it is probable I may not go after all, although I would enjoy seeing that part of the country exceedingly.

"We are going to introduce something of a novelty on the Chicago market next week. Our Western friends seem to have the idea that cattle cannot be fitted for the fat stock market outside of the 'corn belt.' Our Experiment Station is sending 16 head of steers to Chicago next week which I think will have a tendency to explode the Western notion. These animals were purchased in Central Illinois as calves, ranging from four to eight months old; were immunized against Texas fever by your humble servant, and have been developed and fattened on Louisiana products—chiefly, sugar-house molasses, rice, bran and cotton seed meal (very little corn), and the native grasses and hays. In age they average two and one-half years, and 1300 pounds in weight. By the way, the molasses part of it might interest friend Berns, of your city. This experiment, or test, has been undertaken by our Station with the view of advertising our State in this line of animal husbandry, by disabusing the minds of prospective immigrants who may be doubt-

ful of our capabilities in this branch. This of course will give them a practical demonstration, and will, no doubt, be an inducement to many to seek the more genial climate of the Southern States and still be able to continue in the line of industry they have been most accustomed to. Sugar-house, or low-grade molasses has entered into our feeding operations for quite a number of years now, and with excellent results, although it is being fed with more system than formerly. In fact, on many of our large sugar estates it is now the chief source of carbohydrates. By its use, and the utilization of other by-products, such as rice-bran, and cotton-seed meal, along with pea-vine and alfalfa hays, we are able to keep the cost of the ration down pretty low, in comparison to what it used to be when Western oats, timothy hay, etc., were the chief ingredients. On the properties of one of our large sugar planting companies, we managed to reduce the cost of the per diem ration from 33c. to 18c. These people own some 1500 head of large mules, and control away up into the thousands, which will give you some idea of the economy of intelligently balancing their rations with their home products, some of which, the molasses for instance, used to be absolutely thrown away. Another innovation, which we believe we are largely responsible for, is the institution of a cattle-feeding department in connection with the sugar plantations. As I have just mentioned, there has been, and yet is, a great deal of waste of by-products of both the sugar-house or refinery, and the field, in the form of low-grade molasses, green cane-tops, etc., and some time since I was forcibly impressed with the conviction that all this waste could easily and profitably be turned into beef, and gave expression to my belief at one of our farmers' institute meetings in one of the sugar sections of the State. The idea at once took root in the minds of a few of our leading and most influential planters, and good fruit has already been borne. That is to say, some of them have started feeding operations with cattle, and are highly pleased with their prospects, although there has not, as yet, been sufficient time for them to arrive at practical results; of which, however, I have not the least doubt; in fact, am perfectly sanguine, although being a new departure for the sugar planter, it must take time, patience, and experience to make a success of it. The passing of the Cuban Reciprocity measure, and allowing Cuban sugars to enter this country at a reduction of 20%, will force our people here to all kinds of economies in order to succeed at all. And I have no doubt that just such by-indus-

tries as I have mentioned, and no doubt others, will have to be undertaken to prevent failure, or, it may be, total collapse in many instances.

"Now, I expect I am wearing you out. This epistle reminds me somewhat of a case of mixed infection, as I have given you a little of all sorts, both professional and industrial. Before closing, I might just mention that at a recent meeting of the East Baton Rouge Parish Medical Society, the members did me the honor of unanimously electing me an honorary member of the Society. . . . ."

(*From the N. Y.-Phila. Med. Journal, Jan. 9, 1904.*)

CREDIT TO AMERICANS FOR AMERICAN WORK.

UNIVERSITY OF PENNSYLVANIA,
DEPARTMENT OF VETERINARY MEDICINE,
PHILADELPHIA, PA., December 21, 1903.

To the Editor:

SIR: Men doing original work in this country frequently complain that their work is ignored by foreign writers, and there can be no doubt that there is much cause for complaint on this score. Three explanations for this annoying condition have been offered: 1. American publications are not carefully read by foreign investigators. 2. There is doubt in the minds of foreign investigators as to the accuracy of some of the original work that is carried out and published in this country. 3. There is no *Zentralblatt* in this country to present concise reviews of the work done by our investigators.

There is, however, gratifying growth of interest abroad in original work done in this country, so that investigators here who judiciously select the proper means for bringing their work to the attention of workers in similar lines in other parts of the world have less and less difficulty in obtaining the recognition they deserve. One cannot fairly take exception to the tardiness with which our meritorious work has been received abroad in view of the rather prevalent tendency on the part of American writers to look to foreign sources for their quotations and authorities even when they might quote better work and as high authorities at home.

An illustration of this tendency on the part of American writers is given in a recent paper on tuberculosis, published in the *The New York Medical Journal*, December 19, 1903.*

*On the Natural Habitat of the Tubercle Bacillus. By J. W. Kime, M. D.

In this article the writer refers to Koch's statement as to the action upon cattle of tubercle bacilli of bovine and human origin, and says "It must be accepted as correct, and this distinguished authority be conceded to have established the first proposition which he advanced at the Tuberculosis Congress in London." Here is a statement which, in effect, credits Koch with a discovery that was made, remade, and confirmed years before in this country by Theobald Smith, Dinwiddie, Ravenel, and de Schweinitz. The writer adds: "Koch found that the bovine bacillus was pathogenic for all experimental animals, while the human bacillus had a much more restricted range in pathogenesis." While it is undoubtedly true that Koch reported this finding, it was not, as might be inferred from the text, his discovery. Very much more complete evidence of this fact, based upon work done prior to that of Koch, was reported to the same congress before which Koch's paper was read by Dr. M. P. Ravenel, bacteriologist of the State Live Stock Sanitary Board of Pennsylvania. In the same paper the writer states: "Kossel used bacilli of human origin from the mesenteric glands in one case and from the peritonæum in another for the injection of calves, both of which showed generalized tuberculosis at death. Many others have confirmed the findings of Kossel." Here, again, credit is given to a foreigner for work that was done a long time ago in this country, and has been reported by Ravenel, de Schweinitz, and Smith. It is intimated by the form of the statement regarding Kossel's work that it was original work and that it has been confirmed by the work of others. On the contrary, Kossel was but following lines of work previously conducted in this country and, instead of being confirmed, he confirmed the work done here.

In the article under consideration, no direct reference is made to any investigations in this country; American authorities are wholly ignored.

It would be interesting to know why American writers go abroad for authorities and ignore their colleagues in this country in instances where they have done earlier work, more work, and better work than that cited.

LEONARD PEARSON, B. S., V. M. D.,
State Veterinarian.

ALTHOUGH the REVIEW is printing 120 pages this month, many important communications have been omitted through lack of space.

BIBLIOGRAPHY.

VETERINARY STUDIES FOR AGRICULTURAL STUDENTS. By M. H. Reynolds, B. S. A., D. V. M., M. D., Professor Veterinary Medicine University of Minnesota, etc. St. Paul: Published by the Author, St. Anthony Park, Minn., 1903.

It is an infrequent if happy result for a publisher of veterinary literature to be forced to print a second edition of a professional work within two months after its issuance, and the circumstance is certainly worthy of record. The first edition of 1000 copies of "Veterinary Studies," by Prof. Myron H. Reynolds, of the University of Minnesota, was taken from the press early in November last, and before the first of January a second edition was under way. Something like twenty agricultural colleges and State universities have already adopted it as a text-book or have signified their intention of doing so.

When the work is carefully studied this result is not to be so wondered at, because the author-publisher has not been forced to rely upon veterinarians solely as his patrons, else we fear such good results could not have been obtained, for it is the experience of most all publishers of strictly technical veterinary works that the American veterinarian is rather dilatory in investing his money in literature. Dr. Reynolds has sought to address himself more particularly to the task of furnishing "a text for veterinary classes in agricultural colleges," and to "stockmen who are not able to attend our veterinary colleges." At the same time he has striven to give them the "kind and character of veterinary work which is generally demanded and conceded as necessary, without giving our students a sort of training which will turn some of them into unqualified practitioners."

The author has assuredly well accomplished the task which he set out to do, and he has devoted the greatest care in editing and supervising the printing of his book, having employed a splendid highly calendered paper, with large clear type, which make the reading easy and not tiring. His arrangement of his chapters and subheadings is very comprehensive, and the half tones and drawings, which are very numerous, are clear and very illustrative of the text. He aptly explains in this connection that the "illustrations have not been used in any case merely as pictures; every one is intended to illustrate something and make that illustration as impressive as possible." At the end there are about fifty blank pages for notes by the student.

The work itself is divided into 58 lectures, which include

Anatomy, Pathology, Cause and Prevention, Common Diseases, Obstetrics, Medicines, and for the purposes intended it is written in that clear forceful manner that leaves a lasting impression upon the student. We are sure that students of agriculture who follow Dr. Reynolds' course of "Veterinary Studies" will have a much more comprehensive understanding of the principles of veterinary medicine than they could obtain without it, and they will have a wholesome respect for the educated veterinarian, and will be his best clients when they become practical agriculturists. It is a matter of long observation that the laymen with some real knowledge of diseases is always more ardent in the care of his animals and more concerned when they are sick and disabled than he who knows nothing or very little of the dangers from such sources.

We congratulate the doctor on what he has accomplished, and also upon the hearty manner in which his maiden effort has been received. It should certainly stimulate him to produce something in the technical line for his fellow veterinarians.

OBITUARY.

PROF. DR. W. DIECKERHOFF.

The Berlin Veterinary School came to a great loss, on Dec. 14th, through the death of Prof. Dr. W. Dieckerhoff, at the age of 69. The deceased directed the intern clinic since 1877, the same time lecturing on infectious diseases and veterinary jurisprudence. In 1888, the University of Greifswald, as an acknowledgment of his great achievements, conferred upon him the honorary degree of M. D.

He was always a hearty worker for the advancement of the veterinary profession, and through his thoroughness and deep knowledge, he secured the admiration of the fellow men in his profession. His literary accomplishments are proofs of his great experience and trained mind; his works on theory and practice (two volumes), on the Eastern cattle plague, on veterinary jurisprudence, and numerous other subjects in which his personal opinions came chiefly to consideration, show his great practical ability. He was the advocate of eserin, barium chloride, etc., in the treatment of colics, and while his preferred medicinal treatments were not all of great success, at the same time it is through him that the subcutaneous, intratracheal and intravenous applications of medicines have been so extensively adopted in veterinary practice. A. EICHHORN.

SOCIETY MEETINGS.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.

REPORT OF THE CLINICS AT THE MEETING HELD AT ITHACA, SEPTEMBER 15, 16, 17, 1903.

By W. L. WILLIAMS, Chairman Committee on Clinic.

(*Continued from page 787.*)

(9) *Suppurating Open Joint.*—Operator, W. L. Williams.

The patient was an aged gray mare of about 1000 pounds weight and greatly emaciated. About August 1st, 1903, while working in the woods, a snag had entered the antero-lateral portion of the right posterior corono-pedal articulation, which had produced an infected wound. Without recognizing the seriousness of the injury, the owner neglected it for a time, but later secured the services of a veterinarian, which, however, were unavailing because of the surrounding conditions. The patient being unable to travel, was brought to the clinic in an improvised ambulance. She was extremely lame, bearing practically no weight whatever upon the affected limb. There was a copious discharge of purulent synovia on the lateral side of the right corono-pedal articulation, which was much swollen and very sensitive to the touch. The patient was placed upon the operating table, chloroformed, and a transverse incision about three inches long made through the skin, connective tissue, lateral and capsular ligaments into the articulation. Considerable exostosis had already appeared, which rendered the free opening of the articulation difficult, but after considerable labor this was accomplished and the articular cavity was packed with gauze saturated with tincture of iodine, and over this a pack was applied saturated with 1:1000 corrosive sublimate solution and was then securely bandaged. Over all was applied a tarred bandage, which included the entire hoof, and the dressing was allowed to remain undisturbed for three days, when it was repeated, and thereafter the wound was disinfected daily, injected with tincture of iodine and the part covered over with antiseptic bandages.

The discharge of purulent synovia gradually decreased after the operation of September 17th, until September 25th it had practically ceased, and the opening closed. From this time on the swelling about the articulation gradually decreased and the

wound completely healed by October 1st, at which time she placed the foot squarely upon the ground and bore considerable weight upon it. The animal now began to improve in general condition, while the local symptoms progressed favorably, and on October 22d the patient was discharged and traveled home without discomfort, a distance of twelve miles.

This case was intended to demonstrate the good effects of free opening and perfect drainage of those suppurating articulations in which anchylosis is practicable without destroying the value of the animal. The extensive exostoses about the articulation, the result of the long duration of the disease prior to treatment, interfered with results which had been hoped for, but the recovery of the animal after a period of 35 days from the date of operation is, after all, reasonably satisfactory under the circumstances.

(10) *Fistulous Withers and Poll Evil.*—Operators, D. H. Udall and W. L. Williams.

The patient was an aged brown mare, weighing about 900 pounds, emaciated and weak. There was a very large abscess upon the poll, which was discharging freely and extended beneath the neck ligament from the occiput backward about ten inches.

Upon the withers there was an enormous abscess, containing about three quarts of pus, which had not yet opened. On September 16th the animal was placed upon the operating table and chloroformed, and, after shaving and disinfecting the poll, a longitudinal incision was made, beginning behind the diseased part and extending forward on the median line down over the crest of the occiput. The ligamentum nuchæ was separated from the adjacent tissues from the occiput as far backward as it was underrun and the isolated piece excised completely. With Luer's bone forceps a groove was made on the median line through the crest of the occiput to nearly a level with the attachment of the ligament, and all remnants of the ligamentous attachment were curetted away. The cavity was then filled with an antiseptic pack and the wound closed by means of continuous sutures.

A free incision was made into the most prominent part of the abscess on the withers and the pus allowed to escape. Examination revealed a large portion of the spine of the second and third dorsal vertebræ in a necrotic condition, which necessitated their removal. Alongside of these processes the pus had burrowed far down toward the vertebral bodies, to drain which

an incision was made from in front of the scapula obliquely upward and backward until it penetrated the suppurating cavity and afforded dependent drainage. The cavity was thoroughly cleansed with disinfectants and filled with an antiseptic pack retained by sutures. The hæmorrhage during the operation was copious.

The wounds were dressed daily with antiseptics, and stimulants and tonics administered from time to time. The wounds progressed rather poorly, and the animal showed no vigor and grew constantly weaker, the temperature ranging from 101° to 103½°. By November 1st both wounds were nearly healed and the discharge was very slight, but the patient had continued to grow weaker in spite of the local improvement, and died on November 3d. The autopsy revealed the wounds in good condition at every part and nearly healed. There was nothing to be seen in the wounds to directly account for the animal's death, nor were any serious lesions found in any part of the body. The animal had apparently succumbed to the extreme debility resulting from chronic septicæmia.

(11) *Inflammatory New Growth (Botryomycosis?) in the Sheath and Prepuce of a Gelding, with Secondary Abscesses in the Abdominal Walls and Fatal Metastatic New Formations in the Lungs.*—Operators, Drs. C. E. Clayton and W. L. Williams.

The patient was an aged bay gelding of roadster breed and about 1000 pounds weight, which was reported to have been well until sometime in the fall of 1902, when a swelling appeared in the sheath, accompanied by purulent discharge, and gradually increasing difficulty in protruding the penis.

Treatment was attempted by means of injections into the sheath, which, judging from the irritability of the animal, had been of a severe kind.

When presented, complete phimosis existed, the sheath was much swollen, and there was a copious fœtid discharge. The swelling was located at the anterior part of the sheath, was indurated, very firm and of spheroidal form, about eight inches in diameter. The cavity of the sheath was so completely occluded that it was impossible to introduce the hand. The general condition of the patient was good and the presence of the tumor seemed to cause little inconvenience, except that it interfered with urination, but even this was accomplished without great difficulty, although slowly.

On September 17, 1903, the animal was placed on the oper-

ating table, chloroformed and a longitudinal incision made on the median line through the skin and subcutaneous tissue, beginning at the region of the scrotum and extending to the point of the sheath, and the divided tissues dissected back from the tumor as two flaps. The tumor was found to involve the entire circumference of the sheath from the subcutaneous connective tissue to the abdominal tunic, from the anterior opening of the sheath back to the anterior border of the pubis. This was dissected out entirely in one piece. The glans penis was found entirely on the central side of the tumor, apparently normal in every respect and lying in an accumulation of pus, which was prevented from escaping readily by the swelling anteriorly. The prepuce constituted a portion of the tumor and was removed with it. The excised tumor weighed four pounds. The excision of the tumor having included the prepuce, left no support for the penis, and it was fixed to the abdominal tunic by means of two heavy silk sutures. The cutaneous incision was then closed after the hæmorrhage had been controlled and the cavity packed with iodoform gauze. On September 18th, the condition of the patient was satisfactory, and the sheath was dressed similarily to the previous day.

On September 19th, the general condition remained the same and was similarly dressed and a suspensorium added to counteract the weight of the pack in the sheath. The swelling had increased considerably by this time, but by the 21st it had begun to disappear. On September 24th some of the sutures were sloughing out and were replaced by new ones. By September 28th the swelling had so far disappeared from the sheath that the suspensorium and pack were omitted, and the parts washed with 1:1000 corrosive sublimate solution. The general condition of the wound and animal were good. On September 30th the penis was much swollen and the sutures were removed from it, which allowed it to drop down against the skin and protrude somewhat from the anterior opening. There were frequent attempts at urination, and, suspecting cystitis, the urethra and bladder were washed with a 10 per cent. solution of boric acid, which apparently afforded relief. On October 3d, the second series of cutaneous sutures had sloughed out and were not renewed. On October 9th the patient was very dull, had no appetite, the penis was much worse swollen, portions of the glands were gangrenous and the animal lay down much of the time. The parts were thoroughly disinfected and internally nux vomica and ginger were given. No improvement was noticeable on

the 11th, and on the 12th potassium iodide was prescribed in doses of one ounce daily, but the penis continued to swell, although the general symptoms improved somewhat. The penis and sheath were becoming excoriated and sloughing at some points, to overcome which there was prescribed :

Tannic acid,	6 Parts.
Carbolic acid,	1 "
Glycerine,	20 "
Water,	73 "

The swollen penis was wrapped in absorbent cotton, which was saturated with the mixture, and over this the suspensory applied. This line of treatment was followed until October 24th, when the swelling had been so far overcome that the bandage was omitted, and by November 2d the penis had regained its normal size, but protruded about six inches beyond the wound. A small abscess was discovered in the scrotum, which was opened. On November 3d, the animal was placed on the operating table, the parts thoroughly overhauled and disinfected, and a second abscess in the sheath opened. A considerable swelling had taken place by this time along the floor of the abdomen in front of the wound, and an examination revealed an abscess about eight inches in front of the sheath near the median line, which when opened discharged about a pint of pus. Tincture of iodine was now adopted as a disinfectant for the parts on account of its supposed specific action upon the microörganism of the so-called botryomycosis. On the following day the swelling was much reduced, which continued to disappear on the 5th, and on November 6th another large abscess was opened on the left side of the sheath, and one in the abdominal wall. The swelling was increased on November 9th, and the animal very sore. On November 12th the potassium iodide was discontinued, after having taken one troy ounce daily for thirty days.

The swelling in the parts slowly disappeared, and on November 18th the animal was placed upon the table and the sheath reopened along the suppurating tract, where two sutures were discovered in the abdominal tunic, which had been overlooked, and were removed. The suppurating areas were disinfected with hot irons and dressed with tincture of iodine.

Echinacea was given twice daily in doses of ¼ ounce. On November 20th the patient was much worse, very dull and scarcely able to walk. One ounce of sulphate of quinine was given. He was improved on the following day and on the 22d

was feeling quite well. On November 23 the patient was again worse, the eyes were dull, there was a haggard look, and œdematous swelling along the trachea and loud mucous râles in the trachea and bronchi. The operative region showed decided improvement day by day, but the general condition of the animal was constantly growing worse and occasionally discharges of fœtid pus took place from the nostrils. The animal was reduced almost to a skeleton and tottered as he walked.

A diagnosis of metastatic abscess in or near the lung, with unfavorable prognosis, was made, and the animal, continuing to grow worse, was destroyed on December 19th. Aside from the general emaciation, and the traces of the operative wound and neighboring abscesses, which had successfully healed, the notable lesions were confined to the lungs. The right lung was adherent to the mediastinum and diaphragm. In the median side of the right lung near its centre was a hard swelling about five by eight inches in size, of roundish shape, consisting apparently of dense fibrous tissue. In the centre of the neoplasm there was a necrotic mass two inches in diameter.

Near the superior border of the right lung there was a second enlargement about three inches in diameter and having the same general character, except the necrotic centre was wanting. In the posterior portion of the left lung there was a series of three new growths in a line and contiguous to each other, of about the same dimensions and character as that last described.

The tumor which was removed from the sheath on September 17th and those found in the lungs on December 19th were handed to Dr. V. A. Moore for examination, and the following is his report:

"Upon section the growth removed from the sheath was firm, glistening, and of a greyish color, with pockets containing pus scattered more or less irregularly through it. A microscopic examination and cultures of the pus revealed the presence of a streptococcus and *Micrococcus pyogenes aureus*. In a few tubes other bacteria were also present. Sections of the growth fixed and stained showed it to consist of fibrous tissue resulting from a productive inflammation presumably of an infectious origin. The excessive growth of fibrous tissue had stimulated a slight proliferation of the squamous and glandular epithelium of the skin. The structure of the growth was not unlike that frequently found in the productive inflammation of fistulous withers or in certain cases of scirrhous cord. The fact should be noted that the species of pyogenic bacteria present in

this growth were identical with those frequently associated with other productive inflammations in the horse.

"The largest of the growths in the lungs consisted of a necrotic mass surrounded by a thick wall of firm, greyish tissue, which was quite sharply differentiated from the normal lung. The central mass contained pyogenic bacteria like those found in the growth on the sheath. Sections of the wall showed it to consist of fibrous tissue with an occasional slight multiplication of the alveolar epithelium. The smaller growths were uniform throughout and composed of fibrous tissue."

When this case was placed on the operating table the operators were of the opinion that they were dealing with a malignant tumor, which they hoped they had completely removed, affording a fair prognosis, and when the examination revealed the absence of a true tumor, and in its stead an inflammatory new growth of apparently infectious nature, the prospects for recovery seemed brighter, but from the outset the course of the malady was vacillating in the extreme and the outlook changed from day to day. For a time the wounds and general symptoms alike seemed favorable, then the wounds looked bad and the condition good or *vice versa*. Finally the external lesions all healed and there remained nothing on the exterior which looked unfavorable, but here the constitutional symptoms asserted themselves in a more constant and serious form and gradually and surely increased in severity until no doubt was left as to the final termination. The extremities were swollen and œdematous, the countenance haggard, the eyes dull, the pulse feeble, the appetite variable, extreme prostration, intermittent pulmonary discharge, and what seemed to us all the symptoms accompanying the ascendency of a malignant tumor. There was certainly a close clinical resemblance to metastasis of malignant new growths.

The case teaches that such chronic infections in the horse may at times become highly malignant from a clinical viewpoint, as we have once observed in scirrhous cord, with numerous metastatic new growths in liver, kidneys and other abdominal viscera, without pronounced external lesions.

The date of origin of the pulmonary lesions in this case can not be definitely determined, but it seems to us almost certain that the primary lesions were those removed from the sheath and prepuce on Sept. 17, and that those in the lungs took their origin as metastases from these, possibly subsequent to the operation.

At the date of operation we perceived no signs of cachexy or metastasis, and none showed themselves to us until late in the period of our observations.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK COUNTY.

The regular monthly meeting was called to order Wednesday evening, Jan. 6, at 8.30, the President, Dr. J. E. Ryder, in the chair.

On motion, roll-call was dispensed with.

Members present: Drs. E. B. Ackerman, R. R. Bell, C. E. Clayton, R. Dickson, M. J. Dair, R. W. Ellis, F. C. Grenside, R. C. Jones, D. J. Mangan, A. O'Shea, J. L. Robertson and J. E. Ryder. Visitors: Dr. W. W. Yard, Denver, Col.; Dr J. J. Hayes, Sheridan, Wyoming; Dr. Wm. Hayes, New York City, and Dr. Wm. J. Fink, New York City. Also students of the New York–American Veterinary College.

The minutes of the previous meeting were read and adopted.

The Board of Censors and Judiciary Committee had no reports to make.

Dr. Jas. L. Robertson presented a specimen of a large tumor, weighing twenty pounds, which was removed on post-mortem from the small intestines of a draft horse; it was an irregular-shaped affair with a few abscesses in it. History: Due to the fact that Dr. Bell attended the case, at first, he described the symptoms. About a month ago this animal showed colicky pains and apparent symptoms of indigestion. The usual treatment was pursued, including a physic pill; in a few days the horse showed an improvement in spirits and fed well. He was finally sent to work, but in a short time he was taken sick again, showing the same symptoms. This time the animal received a course of tonics, etc., and apparently improved, but after a day or two at work he went through the same performance. These attacks occurred several times, and as nothing seemed to relieve them, Dr. Bell decided to send the horse to the Manhattan stables of the owners, where Dr. Robertson attends. Dr. Robertson said the animal showed the same symptoms as described by Dr. Bell, and nothing could check the colicky attacks; finally a few days ago another attack came on in the evening; the animal gradually grew worse during the night, dying about 9 o'clock in the morning. On post-mortem, Dr. Robertson found this tumor, which was adherent to the small intestines, sur-

rounded by a localized peritonitis. In the stomach he found a quantity of bloody fluid. The animal up to a month ago, when the symptoms first appeared, was in excellent condition. His temperature remained throughout about 101½° F. Dr. Robertson said that on post-mortem he also detected traces of a few melanotic tumors, but this large tumor had no semblance of melanosis; he also stated that he could not find the primary cause of the growth.

Drs. Ryder, Ackerman, Bell, Robertson and Grenside took a very active part in the discussion which followed.

Dr. Bell presented a specimen of a tumor located in the cervix of a small pug bitch. One month prior to the death of the animal the case came under Dr. Bell's observation; it showed decided symptoms of impaction of rectum, the animal making futile attempts at defecation, and in so doing would actually scream with pain. Supposing at the time it to be a case of impaction, he treated it as such without making a physical examination. Later on the case presented itself again for treatment. On physical examination of rectum and vagina he found this tumor of the uterus, which almost filled the entire pelvic cavity. The animal was six years old, and two years previous had given birth to a litter of puppies without any apparent difficulty. An operation was decided upon, with the consent of the owner that in case the tumor was found unoperable the animal could be destroyed at once. On incision it was found that the tumor involved a portion of the vagina, including the entire cervix uteri; in fact, completely filling the cavity, so the animal was destroyed. The specimen was eagerly examined by all who were present at the meeting.

During the discussion which followed, Dr. Ackerman reported a case of a bull terrier bitch which had suffered with a difficult parturition, he having to remove the pups piecemeal. Some time afterwards, tumors developed in the vagina and uterus. He sent the specimens to the laboratory and the pathologist reported them to be cancerous.

Dr. Ellis recalled a case in a dog similar to Dr. Bell's; symptoms just alike. On examination he found a tumor in the vagina, which was removed, there being no recurrence of the growth.

Dr. Ackerman stated that in his case, he thinks the primary cause of the growths was due to the injury which the mucous membrane suffered in the attempts to remove the pups. He also mentioned that the incident which attracted his attention

to the condition of the bitch was the vain attempts of a bull dog to serve her when she was in heat; the dog could not connect. So Dr. Ackerman made an examination and found the growths. The animal being his own he destroyed it.

Dr. Robertson suggested that Dr. W. Lellman be requested to kindly make a microscopical examination of the tumor which Dr. Bell presented.

Dr. Ackerman reported another dog case which he was called to treat recently. He could not get much history of the case. When he saw the dog it seemed to be in the best of health and spirits, when suddenly it would walk in and out of the room, then stand for a second or so and shake its head; these movements would be immediately followed by a severe contraction of the muscles of the neck to such a degree that it would appear as if the head would telescope into the body. As these attacks would follow exercise, Dr. Ackerman advised rest; but nevertheless the attacks persisted just the same. Another peculiar feature about the case was in the fact that the spells would appear principally in the morning. Sometimes these spells would last for an hour or more. He administered antispasmodics without effect. Thinking that the trouble was due to indigestion or parasites causing a reflex action, he gave intestinal antiseptics, antiferments, and anthelmintics. At the present time the animal continues to have the attacks, but they are not as frequent.

In the discussion which followed, Dr. Mangan stated that he saw a similar case in a fox terrier, in which a condition of torti-collis or wry neck developed, and on post-mortem parasites, the *Filaria immitis*, were found in the heart.

Dr. Clayton asked Dr. Bell if anything was found on microscopical examination of the lung specimen which was removed from a coon cat. Dr. Bell replied that Dr. Wilson, the pathologist at the college laboratory, reported that the lesion in the lung was a simple circumscribed broncho-pneumonia, and that it was not of a specific nature. It appeared to Dr. Bell that the coon cat coughed itself to death.

Dr. Grenside asked if some member present would give a definition of soundness; he stated he never read or heard one which satisfied him.

Drs. Ryder, Robertson, Grenside, Bell, Clayton, and Dickson discussed the question. Various definitions were offered, but none seemed satisfactory. The question was confined to its legal sense.

Dr. Bell stated that on the witness stand an expert veterinarian would be justified in saying that a definition of soundness is an unsettled question.

Dr. Ellis suggested that each and every member give his individual definition of soundness in writing at some future meeting.

This question of Dr. Grenside's brought forth some very fine discussion, and definitions of soundness.

As the hour was growing late, a motion was made, seconded, and carried, to adjourn.

Before the adjournment the President announced a very elaborate programme for the next meeting, consisting as follows:

Paper by Dr. W. Lellman, "Tuberculosis in the Cat," with microscopical demonstration.

Paper by Dr. R. W. Ellis, "The Care of Horses' Teeth," with a demonstration of a new dental machine.

Paper by Dr. Jas. L. Robertson, on "Weaving."

Also reports of cases. D. J. MANGAN, *Secretary*.

THE ONTARIO VETERINARY ASSOCIATION.

The annual meeting of this Association was held in the Veterinary College, Toronto, Canada, on Wednesday, Dec. 23d, 1903, the President, Dr. J. H. Tennent, V. S., of London, in the chair. As there were matters of much interest to be discussed in the course of the day, he called for the usual business routine at once.

The minutes of the previous meeting were then read and confirmed.

The Secretary-Treasurer's and Auditor's reports were read and adopted, showing the finances to be in a favorable condition.

A number of new members were duly proposed and accepted.

A number of communications were then read, among the most important being those from T. Eaton Jones, Esq., M. R. C. V. S., Secretary Congress of Royal Institute of Public Health, inviting this Association to send delegates to that meeting in Lamport, England, last summer; from Mr. John R. Mohler, Department of Agriculture, Washington, D. C., U. S., relating to the proposed monument to the late Prof. Nocard; from W. Truman Barrett, Esq., Honorable Secretary Victoria Veterinary Benevolent Fund; from J. McKenny, Esq., Secretary Veterinary Medical Association of Ireland, with the reports of a case respecting the exemption of veterinarians from attendance on juries. These had all been promptly replied to.

Dr. J. A. Tancock, V. S., of London, read an interesting and instructive paper on "Horse Shoeing."

Prof. A. Smith, Principal of the Ontario Veterinary College, gave an excellent address and exhibited a specimen of a sarcomatous tumor in the nasal chambers of the horse, and described the case as it existed in the animal before as well as after death.

Dr. D. King Smith read a particularly interesting paper on "Azoturia" in the horse, especially marking the pathological conditions existing therein.

The meeting adjourned for luncheon.

The President opened the meeting after lunch by an address that was well received. He gave a synopsis of the late meeting of the American Veterinary Medical Association in Ottawa, and spoke with much enthusiasm as to its success, giving especial credit to Dr. Rutherford, Chief Veterinary Inspector of the Dominion of Canada, for his energetic and untiring exertions in advocating that the meeting should be held in Ottawa, the capital of our Dominion, and in making that meeting the undoubted success it proved to be. He also dwelt at some length on advancing the standard of our profession, and on increasing the period of study at the Ontario Veterinary College.

Dr. W. J. R. Fowler, V. S., read an interesting paper on "The Action of Arecolin." He had injected it for purposes of experiment on different horses, both intravenously and hypodermically, causing several actions of the bowels in a few minutes, it acting two or three minutes quicker by the intravenous mode.

Dr. R. Barnes, V. S., of London, gave a good description of the injection of oxygen into the udder of the cow in cases of so-called parturient apoplexy. He exhibited the small tank that he uses. It is about 14 inches high and 4 inches in diameter, and contains 40 gallons of compressed oxygen. His record of cases shows extraordinary success with this mode of treatment.

His Worship, Mayor Urquhart, of Toronto, gave a short address, welcoming the members to the city. He said that he had a very high opinion of the advantage of scientific knowledge in the treatment of the diseases of the lower animals, and in conclusion paid a glowing tribute to the success of the teachings of the Ontario Veterinary College.

Dr. Rutherford, Chief Veterinary Inspector, gave an eloquent address on the general advancement in the education and position of the veterinary profession in Canada. He dwelt especially on better legal protection. He read extracts from the Veterinary Act of Manitoba, which is a most excellent Act, and thought

that it would be well to get something similar to it in the Province of Ontario. He urged pushing for protection by earnest and united effort, and said now was the time. He suggested that steps should be taken at once to organize members of the profession in counties or groups of counties. That the keynote of this movement is organization. He said of the financial contributions that he had received to assist in defraying expenses incurred in connection with the late meeting of the American Veterinary Medical Association in the City of Ottawa, an overplus of $111.65, and he proposed handing over this sum to the Ontario Veterinary Association as a nucleus for further contributions, as funds would be required for organization.

Prof. A. Smith, C. Elliott, J. D. O'Neil, J. H. Reed and others spoke strongly in favor of organization.

A subscription was at once taken up. Prof. A. Smith subscribed $100; several other members subscribed various sums, and it was resolved that Messrs. J. H. Tennent, J. G. Rutherford, T. Allen, J. H. Reed and J. F. Quinn be a committee on organization.

It was also resolved "That the Secretary be instructed to issue circulars to all members of the veterinary profession in Ontario requesting subscriptions for the purpose of pushing forward at once in our endeavors to obtain better legal protection for our profession in the Province of Ontario. That Dr. Rutherford, Chief Veterinary Inspector for the Dominion of Canada, Ottawa, be the Treasurer of the fund and that all cash or checks be sent direct to him."

In consequence of a communication from Mr. John R. Mohler, Department of Agriculture, Washington, D. C., U. S., the subjoined resolution was also passed: "That the Secretary be instructed to issue circulars to all members of the veterinary profession in Ontario, informing them of a proposed monument to be erected to the memory of the late Prof. Nocard, and request them to forward their subscriptions for this desirable object to Dr. Rutherford, V. S., Ottawa, and he will forward them to their proper destination."

The sum of $25 was appropriated for a medal to be presented and to be competed for by the graduating class of the Ontario Veterinary College at the approaching spring examinations.

During the course of the meeting the operation of caponizing was performed on some roosters by Mr. Phieffer, a student of the Ontario Veterinary College. It was viewed with much interest by the members present.

The following are the officers elected for the ensuing year:

President—W. Lawson.

First Vice-President—J. H. George.

Second Vice-President—F. J. Gallanough.

Secretary and Treasurer—C. Heath Sweetapple.

Directors—Messrs. S. J. Jupp, F. J. Gallanough, J. Pickel, R. Barnes, O. H. Duncombe, F. A. Hutton, P. Herold, M. J. Kellam.

Auditors—Messrs. C. Elliott and J. H. Reed.

Delegates to the Industrial Fair, Toronto—Prof. A. Smith and Col. T. H. Lloyd.

Delegates to the Western Fair, London—J. D. O'Neil and J. A. Tancock.

The retiring President on vacating the chair gave a short address thanking the members for the uniform courtesy and kindness extended to him during his two terms of that office, and introduced his successor, Dr. Lawson.

Dr. Lawson on taking the chair thanked the members most heartily for the honor conferred and promised to use his best efforts in the interests of the Association, and to further by all the means in his power the advancement of the position and interests of the veterinary profession in Ontario.

C. H. SWEETAPPLE, *Secretary.*

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The annual meeting of this Association was held at the Trenton House, Trenton, N. J., Thursday, January 14th, 1904, and was called to order by the President at 10 A. M. Twenty-six members were in attendance. Veterinarians from other States in attendance were Drs. Pearson and Hoskins, of Pennsylvania; Dr. W. Reid Blair, of the New York Zoölogical Park, and Dr. R. E. Waters, of Gravesend, L. I. The State Grange was represented by the Master, Hon. Geo. W. F. Gaunt, of Mullica Hills; the State Board of Agriculture by the President, Dr. Voorhees.

Dr. L. L. Horner, of Woodstown; Dr. James W. Little, of Newark, and Dr. Robert Dickson, of Sea Bright, were elected to membership.

Hon. George W. F. Gaunt, Master of the State Grange, was elected an honorary member.

Reports of Committees and Delegates.—Dr. Wm. Herbert

Lowe reported for the Legislation Committee. Dr. George reported for the Publication Committee. A report from the Press Committee was given by the Chairman, Dr. Budd. Report of Committee on Delinquent Members was made by Dr. Vander Roest. The Secretary made his usual report and the Treasurer reported a small balance in the treasury. Dr. Wm. Herbert Lowe and Dr. T. E. Smith reported as delegates to the New York State Veterinary Society. Dr. Smith also reported as a delegate to the American Veterinary Medical Association. Dr. Treadwell, delegate to the Connecticut State Association, made a report, as did Dr. Pope, delegate to the Illinois State Veterinary Association and the International Live Stock Exposition. Dr. Budd reported as a delegate to the Atlantic City Horse Show. Dr. Budd pointed out the advantages resulting to veterinarians from horse shows and urged members to encourage them in every way possible.

Dr. Vander Roest, as a member of the Legislative Committee of the State Road Drivers' Association, spoke of anticipated legislation to govern the speed and management of automobiles and requested members of the Veterinary Medical Association of New Jersey to aid in the enactment of the proposed bill.

A letter from Mrs. Wm. B. E. Miller was read by the Secretary. The letter announced the illness of Dr. Miller and expressed regrets at his inability to be present at the meeting. It was voted that the Secretary write to Dr. Miller and express to him the sympathy of the Association.

A letter from Dr. John R. Mohler called attention to the efforts being made to secure funds for erecting a suitable monument to the memory of Prof. Nocard. It was voted that the Treasurer be authorized to send the sum of ten dollars to Dr. Mohler as a contribution toward this fund.

The advisability of converting the annual meeting into a two days session was quite fully discussed. Some spoke for a two days session at the annual meeting and a discontinuance of the semi-annual meeting, but after considerable discussion the matter was laid on the table.

Dr. Vander Roest spoke of cases of illegal practice, and a long discussion followed. The concensus of opinion was that in order to prosecute such cases the State Board of Examiners must have suitable evidence and that such evidence should be furnished by the complainant. Upon motion the discussion was closed and the meeting adjourned to enjoy one of the best dinners which the Trenton House serves.

Dr. John B. Smith, State Entomologist, read a paper entitled, "Insects that are the Carriers and Cause of Animal Diseases." Dr. Smith's paper was well received and lead to considerable discussion and inquiry.

Dr. W. Reid Blair, Veterinarian and Resident Pathologist N. Y. Zoölogical Park, read an interesting paper on "Modes of Tubercular Infection in Wild Animals." Dr. Blair's paper was discussed by Dr. Pearson and others.

Dr. Halliday, of Bayonne, read a paper stating his experience with several cases of forage poisoning or so-called cerebrospinal meningitis. Dr. Halliday's paper was discussed by Drs. Loblein, Pearson, Rogers and Hurley.

Dr. Halliday also read a report of a supposed case of tuberculosis in a horse, and gave the results of the post-mortem. This paper led to much debate and a question as to the exact nature of the disease. Dr. Halliday stated that unfortunately the viscera had been inadvertently destroyed while he was making plans for a bacteriological examination.

Dr. Tuttle read a paper entitled, "Echoes from the New Jersey Sanitary Association Meeting." As Dr. Tuttle had attended the full session of the above association and taken careful notes, his report was of great interest and replete with information as to the advancement being made in sanitary problems.

Dr. R. E. Waters, of Gravesend, L. I., was present and prepared to operate on a cryptorchid, but unfortunately a suitable subject could not be secured. Dr. Waters very cheerfully responded to the questions propounded by members, and as far as possible under the circumstances explained his method of operating.

A report concerning the outbreak of a peculiar disease in Ocean County was read by the Secretary. The report was prepared by Dr. Chas. H. Perry, of Lakewood. A discussion followed the reading of the report.

Resolutions of respect to the memory of the late Dr. R. R. Letts were adopted.

Hon. George W. F. Gaunt, Master of the State Grange, was introduced, and in a pleasing manner congratulated the Association upon the advancement which it had made and expressed himself honored to stand before such a body of men.

It was voted that the next meeting, occurring on Thursday, July 14th, 1904, be held at Newark. At 5 P. M. the meeting adjourned.

GEORGE W. POPE, *Secretary.*

NORTH DAKOTA VETERINARY ASSOCIATION.

The second annual meeting was held at Hotel Dacotah, Grand Forks, on January 12, 1904. The following veterinary graduates being present: Drs. Van Es, professor of Veterinary Science, Agricultural College, Fargo; S. P. Smith, Cando; J. W. Robinson, Coal Harbor; W. F. Crewe, Devil's Lake; J. N. Sheppard, Fargo; D. Fisher, Grandin; R. J. Bestul, Grafton; W. J. Grady, Hendrum, Minn; B. O. Minge, Langdon; J. B. Campbell, Larimore, and E. J. Davidson, Grand Forks.

Owing to the morning trains being late and some of the members being delayed, the meeting did not come to order until afternoon. The forenoon was principally taken up by clinics at Dr. Davidson's Infirmary. At 1 P. M. meeting was called to order by President Smith. Minutes of last meeting read and approved. The Committee on Resolutions and By-laws submitted a copy, which was read by the Secretary and adopted as read. It was moved and seconded the President appoint a Committee on Legislation tending to have our veterinary laws in regard to the Examining Board amended so that the board might be self-sustained. The dues of the Association were fixed at $3.00 per annum and paid by all members present.

There being no further business, the reading of papers was next in order, the following programme having been prepared: A paper on "Immunization and Its Practical Application,"* by Dr. Van Es, an excellent paper and freely discussed by Drs. Crewe, Sheppard, Bestul and Smith.

A paper on "Swamp Fever," by Dr. D. Fisher, of Grandin; discussion participated in by all members present.

A paper entitled a "Pasture Outbreak," by Dr. J. W. Robinson, of Coal Harbor. This proved to be an instructive paper. Discussion was led by Dr. Van Es, and many interesting points were brought out.

A paper on "Cerebro-Spinal Meningitis," by Dr. S. P. Smith, of Cando. Discussed by Drs. Crewe, Bestul, Sheppard, Davidson, Van Es.

A paper on "Acute Synovitis," by Dr. Davidson, of Grand Forks. Discussed by all present.

The next meeting will be held at Hotel Metropole, Fargo, N. D., the second Tuesday in January, 1905.

E. J. DAVIDSON, *Secretary.*

* Will be published in an early number of the REVIEW.

PASSAIC COUNTY VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting was held at Dr. Wm. Herbert Lowe's office, 169 Paterson St., Paterson, Jan. 5, 1904, with the President in the chair. The meeting was called to order at 8.30 o'clock P. M., and the following members answered to their names: Drs. John H. Degraw, Wm. H. Lowe, Jr., Wm. Herbert Lowe, Paterson; Geo. W. Pope, Athenia; J. Payne Lowe, Passaic; Wm. J. Fredericks, Delawanna.

Minutes of last meeting were read and approved. The Secretary reported that he had received a communication from Dr. John R. Mohler, wishing the Association to contribute towards the erection of a monument to Prof. Nocard, to be erected in France. The members of the Association voted to contribute five dollars for the erection of monument; and the Treasurer was instructed to send a check for the same to Dr. John R. Mohler, Department of Agriculture, Washington, D. C.

Dr. Fredericks made a motion that the next regular monthly meeting be held at Dr. J. Payne Lowe Hospital, Jefferson St., Passaic, on Feb. 2, 1904. The motion was carried to that effect.

The State Veterinary meeting will be held at Trenton on Jan. 14, 1904, at 10 A. M., at the Trenton House.

The State board of Veterinary Medical Examiners will meet at the State House, Trenton, on Jan. 22 and 23, 1904.

President Dr. Wm. Herbert Lowe attended the meeting of the New Jersey Sanitary Association, held at Lakewood, on Dec. 4 and 5, 1903, made a report on Animal Diseases and Foods, which is published in the January number of the AMERICAN VETERINARY REVIEW.

Without any further business the meeting was then adjourned until the next regular meeting, which will be held at Dr. J. Payne Lowe's Hospital, Passaic, Feb. 2, 1904.

WM. J. FREDERICKS, V. S., *Secretary.*

COLORADO VETERINARY MEDICAL ASSOCIATION.

This Association held its second annual meeting at the Gentleman's Riding and Driving Club rooms, Denver, Jan. 4. There was a large attendance and four interesting papers were read, which drew out much discussion. The papers were as follows: Dr. Geo. H. Glover, "The Relation between Human and Bovine Tuberculosis"; Dr. F. W. Culver, "Pneumonia";

Dr. A. B. McCapes, "Ridgling Castration"; Dr. Charles G. Lamb, "Horseshoeing."

The officers and Board of Directors were reëlected for the coming year.

Seven new members were duly elected.

The meeting was voted a perfect success, and the prospects of the profession look very bright for the future.

The meeting adjourned to meet on the first Monday in June, 1904. M. J. WOODLIFFE, M. D. C., *Sec.-Treasurer.*

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular monthly meeting of this Association was held at Boston, Dec. 23, 1903, and there was a very good attendance, and business relative to the new registration bill, etc., disposed of.

It was voted that twenty-five dollars be contributed to assist in erecting a memorial to the late Dr. Nocard.*

Dr. Winchester read an interesting paper on "Glanders," which was much appreciated by the members present. This was the first of a series of papers, to be given this winter, on the subject of glanders. F. J. BABBITT, *Secretary.*

NEWS AND ITEMS.

FREDERIC T. DOLAN, M. D. V., of Dorchester, Boston, Mass., died on Nov. 16.

THE Chicago Veterinary College has a foot-ball team which distinguished itself the past fall in competition with other college teams.

IT is reported that rabies exists in the flock of sheep of Peter S. Tiger, near Somerville, N. J. Affected animals butt and kill each other in fierce battle.

AT the St. Louis Exposition an effort will be made to organize an association of breeders of the American carriage horse, with special reference to performances in the show ring.

DR. ADOLPH EICHHORN, Inspector B. A. I., who was transferred to the East in connection with the successful crusade against foot-and-mouth disease, is again stationed at Milwaukee, Wis.

DR. ROBERT H. MCMULLEN, of Buffalo, N. Y., has been appointed, after civil service examination, by the government, as

* This contribution was forwarded to the REVIEW, and has been transmitted by us to the French Committee in charge of the fund.

an inspector of cattle entering the Philippines, and sailed from San Francisco for Manila in November.

DR. D. J. DIXON, of Hoboken, N. J., after resisting the shafts of Cupid for lo these many years, has finally surrendered to a lady living in the vicinity of his newly-purchased stock farm in New Jersey, and he is now a happy benedict. We offer our congratulations.

DR. A. W. AXFORD, Naughright, N. J., a prominent member of the Veterinary Medical Association of New Jersey, mourns the death of his estimable wife, who was his companion for over thirty years. Mrs. Axford was the daughter of Mr. and Mrs. John Naughright, founders of the village of Naughright.

MR. ALEX. EGER, the Chicago agent of the REVIEW, suffered one of the saddest bereavements that fall to the lot of man in the loss of three sisters, a niece and a nephew, in the recent destruction by fire of the Iroquois Theatre, in Chicago. We tender him our sincerest sympathy, and know that his friends throughout the profession of the country will share in this expression.

"DR." GEORGE LOCKE, Flemington, N. J., was before Judge Connet January 11th, for sentence on the charge of illegally practicing veterinary medicine, to which indictment was found at the September term of Court, and to which he plead *non vult*. Judge Connet told Locke that owing to his recent severe illness and for other reasons he would suspend sentence and warned him not to continue practicing without a license.

MR. E. G. SWIFT has been promoted to the position of general manager of the extensive drug manufacturing house of Parke, Davis & Co., of Detroit, to succeed the late William M. Warren, whose death was announced in the January REVIEW. The high ideals of this firm have won the confidence of the veterinary profession, and Mr. Swift will undoubtedly keep to the standard of professional dignity which characterized his lamented predecessor.

CARING FOR OLD HORSES.—In New York there is an association known as "The Equine Provident Society," whose object is the care of aged horses which have done good serviceand through infirmities or advanced age are no longer able to be profitable or pleasureable to their owners. It has established a ranch at Central Islip, Long Island, and is supported by voluntary contributions. In public places small boxes for silver coins are placed, with a card descriptive of the object of the home. In the appeal for funds the following lines are quoted: "'No

heaven for brutes', you fancy that is clear ; Then let us make a heaven for them here. If immortality is to them denied, Then all the more incumbent doth it seem, To make their earthly life a happy dream."

DOSING FOR MILK FEVER.—American special-purpose dairy papers, and some general-purpose journals, continue to publish antiquated formulas for the cure of milk fever in cows, under which thousands of the best annually go down to death, while enlightened Canadian veterinarians and dairymen are saving the lives of over 95 per cent. of cases by the simple process of injecting pure oxygen into the udder through the teats, and without any dosing with salts or other medicines, one firm of veterinarians having saved 47 cases out of 48 by this means, the only troublesome cases having been those which had been dosed before the up-to-date doctor was called in. Another veterinarian reports a magical recovery in every case except those previously dosed, a few of which have succumbed to pneumonia, the result of medicine given having entered the trachea, owing to the inability of the cows to swallow. Even in these cases, the administering of the oxygen brought the cows out of their state of coma, and would doubtless, have saved their lives but for the dosing. When dairymen and cow-keepers generally learn to adopt nature's course of letting the calf suck for the first three or four days after it is born, or being careful to milk the cow only partially for that period, there will be a mighty falling off in the number of cases of milk fever, and if the few cases that then occur are treated with the oxygen remedy the losses will be practically nil, but it takes some people a long time to learn, and the oxygen cure is so simple that it doesn't appeal with force to those who are fond of physic. It is well, however, that so many have so far advanced as to rule out of the list of cattle complaints what used to be termed hollow-horn, the orthodox treatment for which was boring a gimlet hole in the horn, splitting the tail, and filling both orifices with salt and pepper. The practice of dehorning has knocked one branch of this business endwise. Let us hope the tails may not have to go as a sacrifice to ignorance or superstition. But whatever you do, dear reader, don't dose the cow for milk fever, for the good ones that have been killed by that process would make a hecatomb higher than the Himalayas. If you are not within reach of a veterinarian who has the oxygen outfit, get a bicycle pump with a rubber tube and milking tube attachment, and fill the udder with fresh air, which is over 20 per cent. oxygen, and ten to one a quick and

sure cure will result. This has, to our knowledge, been proven over and over again.—(*Farmers' Advocate, Winnepeg, Man.*)

TAIT BUTLER AND THE CATTLE TICK.—John E. Wing, staff correspondent of the *Breeder's Gazette*, has the following in his letter in the issue of Dec. 23 with reference to his recent visit to North Carolina: "Dr. Tait Butler is one of those enthusiastic impracticable troublesome men who won't let 'well enough' alone. He is like Christopher Columbus and Patrick Henry and a lot more of those dreamers who insist on stirring things up and overturning the order of good old things. Tait Butler knows the cattle tick. He knows its strength and its weakness. He has bottled ticks that were born in the bottle and have lived on the bottle, on the inside at least, since last April, waiting patiently for a breakfast time that will never be. It rather dismayed me when Tait Butler showed me those myraid young ticks crawling about the inside of that empty bottle, waiting their chance to get on their coveted host, some unwitting cow, perhaps a 'thoroughbred' from the North, with its veins full of rich warm blood ripe for impregnation with the deadly fever germ. You know these little ticks carry within their minute bodies yet more minute germs that attack the red corpuscles in bovine blood. The tick cannot help it, yet because it does convey these germs it must die, or rather it must never live. Tick eradication by dipping is impracticable, so thinks Tait Butler. Tick starvation by change of pasture, by leaving the young broods to hatch, to crawl upon the grass, waiting patiently for cows that never come, until they resolve themselves into dust again, he has proved to be practicable and easy in the higher lands of Western North Carolina. It costs little thus to eradicate ticks. It is a mere matter of education and coöperation among farmers. Already they are hard at work in the hill counties. They make a farm-to-farm canvass, report the presence or absence of ticks and counsel the farmers how to proceed to rid their cattle and their fields of them. Their chief trouble is with the man with one or two cows who does not know about ticks nor care about ticks, and who is too indifferent to try to eradicate them. It may need law to help him. Tait Butler organizes county cattlemen's associations to combat this indifference. He thinks he can gradually crowd the quarantine line down farther and farther. He sold a carload of cattle that he had fed below the line last spring and the mere fact that they were in quarantine pens cost him $175 in the price received for them."

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table will be found the dates, places of meeting, and Secretaries' names and addresses of all the Veterinary Medical Associations of the United States and Canada, so far as obtainable by the REVIEW. Secretaries are urgently requested to see that the organizations which they represent respectively are included in the list, and that the details concerning them are properly stated. We shall be glad to receive notification of errors of commission and omission.

Name of Organization.	Date of Next Meeting.	Place of Meeting	Name and Address Secretary.
American V. M. Ass'n.....	Aug. 16-19, '04.	St. Louis, Mo.	J. J. Repp. 5249 Addison St., Phila., Pa.
Vet. Med. Ass'n of N. J.....	July 14, 1904.	Newark.	G. W. Pope, Athenia, N. J.
Connecticut V. M. Ass'n.....	Feb. 2, 1904.	Hartford.	B. K. Dow, Willimantic.
New York S. V. M. Soc'y....	September, 1904	Brooklyn.	W. H. Kelly, Albany, N.Y.
Schuylkill Valley V. M. A....	.....	.....	W. G. Huyett, Wernersville, Pa.
Passaic Co. V. M. Ass'n.....	Feb. 2.	Passaic, N. J.	W. G. Fredericks, Delawanna, N. J.
Texas V. M. Ass'n.....	Call Ex. Com.	.....	H. D. Paxson, Ft. Worth.
Massachusetts Vet. Ass'n.....	Monthly.	Boston.	F. J. Babbitt, Lynn, Mass.
Maine Vet Med. Ass'n.....	April, 1904.	Waterville.	C. L. Blakely, Augusta.
Central Canada V. Ass'n.....	.....	Ottawa.	W. W. Boucher, Ottawa.
Michigan State V. M. Ass'n...	Feb. 2, 1904.	Lansing.	Judson Black, Richmond.
Alumni Ass'n N. Y.-A. V. C..	April, 1904.	141 W. 54th St	F. R. Hanson, N Y. City.
Illinois State V. M. Ass'n.....	Feb. 23.	Peoria.	W. H. Welch, Lexington, Ill
Wisconsin Soc. Vet. Grad.....	Call of Pres't.	Racine.	S. Beattie.
Illinois V. M. and Surg. A....	.....	.....	W. A. Swain, Mt. Pulaski, Ill
Vet. Ass'n of Manitoba	.....	.....	F. Torrance, Winnipeg.
North Carolina V. M. Ass'n...	July, 1904.	Greensboro.	T. B. Carroll, Wilmington.
Ontario Vet. Ass'n.....	December, 1904	Toronto.	C H. Sweetapple, Toronto.
V. M. Ass'n New York Co....	1st Wednesday of each month.	141 W. 54th St	D. J. Mangan, N. Y. City.
Ohio State V. M. Ass'n.....	.....	.....	W. H. Gribble, Washington C. H.
Western Penn. V. M. Ass'n...	1st Wednesday of each month.	Pittsburgh.	F. Weitzel, 100 Parkway, Allegheny.
Missouri Vet. Med. Ass'n.....	Aug. 15, 1904.	St. Louis.	Stanley Smith, Columbia.
Genesee Valley V. M. Ass'n...	.....	.....	J. H. Taylor, Henrietta, N.Y.
Iowa State V. M. Ass'n.....	.....	.....	H. C. Simpson, Denison, Ia.
Minnesota State V. M. Ass'n ..	.....	.....	J. S. Butler, Minneapolis.
Pennsylvania State V. M. A...	March, 1904.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila.
Keystone V. M. Ass'n.....	2d Tuesday of each month.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila
Colorado State V. M. Ass'n...	1st Mon. in June	Denver.	M. J. Woodliffe, Denver.
Missouri Valley V. Ass'n.....	Feb. 15, 1904.	Kansas City.	B. F. Kaupp, 3712 Michigan Ave., Kansas City
Rhode Island V. M Ass'n....	.....	.....	T. E. Robinson, Westerly, R I
North Dakota V. M. Ass'n....	2d Tues. Jan.	Fargo.	E. J. Davidson, Grand Forks
California State V. M. Ass'n...	Mch. Je. Sep, Dc	San Francisco.	P. H. Browning, San Jose.
Southern Auxiliary of California State V. M. Ass'n....	Jan. Apl. Jy, Oct.	Los Angeles.	H. D. Fenimore, Los Angeles
South Dakota V. M. A.....	.....	.....	E. L. Moore, Brookings.

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Subscription price, $3 per annum, invariably in advance; foreign countries, $3.60; students while attending college, $2; single copies, 25 cents.

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Alex. Eger, 34 East Van Buren St., Chicago, Ill., Veterinary Publisher and dealer in Veterinary Instruments, Books, and Drugs, is the authorized agent for the REVIEW *in Chicago and the Middle West, and will receive subscriptions and advertisements at publishers' rates.*

OWING to an influx of new subscriptions in December, the December issue though larger than any previous one, became rapidly exhausted; the result of which is, that there are many who, desiring to begin their subscriptions with the December number and prior to it, have had to be disappointed. And while we regret such disappointment to any one desiring that especial number as the beginning of his subscription, we especially regret it, where it chances to be a subscriber who has allowed his subscription to run out with the Aug., Sept. or Oct. number, and now desires to renew it, and naturally wants all the back numbers for binding. In view of that fact, the publishers would call the attention of those who do *not* bind, to the fact that they will gladly purchase DECEMBER 1903 NUMBERS OF THE REVIEW, at regular price, if they will communicate with the Business Manager at 509 West 152nd Street, New York.

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AMERICAN VETERINARY REVIEW.

MARCH, 1904.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, January 20, 1904.

VETERINARIANS IN THE ACADEMIES OF MEDICINE.—No one is infallible, and personally I know of many errors which I have committed, and which, had I given more thought to it, I would have avoided. Among the many that I am willing to acknowledge there is one which has in late years been made more evident, and to which I must refer, to caution friends in America who might be tempted to fall into the same error.

Years ago I had been asked to join the Academy of Medicine in New York. I considered the proposal, thought of the good that the veterinary profession might gain by having one of its members among the scientific body, and I consented to have my candidature presented, with the proviso that I would be received, if I was, as a veterinarian, and not as a physician. The result was not long in becoming known: I was beautifully blackballed. No one can enter the Academy except as a physician, and I believe as a physician in practice. A second attempt was made months after by other friends in my behalf, but the conditions being the same, the result was also similar, and I trust that these results were the reason that no veterinarian has yet entered the Academy of Medicine.

Is it so important, it might be asked? Can veterinarians be of some use in an Academy of Medicine?

The attendance that my leisure time has allowed me to give to that honorable body in Paris has convinced me that veterinarians have their place marked in the ranks of such society, that they will find occupations pertaining to the profession among the various committees, and that veterinary science can but gain in elevation, especially in the United States, by such membership.

* * *

In the Academy of Medicine of Paris there are 150 active and 200 associate and corresponding members; these are divided into national and foreign. The active members are arranged into sections, viz.: that of anatomy and physiology, in which I find the name of Chauveau, so well known to all of us; the section of medical pathology; that of surgical pathology; that of therapeutic and medical natural history; that of practical surgery; of pathological anatomy; of obstetrics; of public hygiene; legal medicine; that of veterinary medicine, with Trasbot, the late director of Alfort; Barrier, his successor; Railliet, the learned professor of natural history and therapeutics of Alfort; Meguin, a retired military veterinarian, and Menard, the director of the Vaccine Institute of Paris. There are two other sections, that of medical physics and chemistry and that of pharmacy, with one veterinarian, Paul Yron.

To recapitulate: there are to-day seven members of the veterinary profession belonging to the Academy de Medecine here. And there is yet a vacancy for which there are four candidates. Among the national corresponding members I find the names of six veterinarians—total, 13.

* * *

But, let us see to what special line of work these veterinarians, active members, are called. The permanent committees of the Academy are nine in number. In that of epidemics, veterinarian Meguin belongs; in that of vaccination, Menard; in that of tuberculosis, Barrier; in that of associate members, Trasbot; Chauveau, Railliet and the others are in the committee of corresponding members.

Such is the position of members of our profession in the French Academy of Medicine. I know that a similar condition exists in Belgium, and I have no doubt it is to be found also in other countries of Europe. Why should it not be so in America? Perhaps it is! I do not know; but, if it is not, and if the fault is due to causes similar to the one that excluded me years ago, for the good of the profession, I think veterinarians of America, who possess the degree of M. D., and I believe there are many, ought to apply for admission in the Academy of Medicine with their M. D. title, and once admitted, their D. V. S. or similar degree will soon open their doors for special work.

* * *

Examining Horses for Soundness.—There is no doubt that too much care and attention can never be taken in these days of progress in surgery; and, no matter how minute and strict an examination is made at the time of purchase, and no matter how conscientious and honest an opinion may have been given, there seems to be always some fear of unpleasant surprise springing out on the poor veterinarian who has been examining a horse for soundness. Of course, much depends on the manner of interpretation of the sound or unsound condition of the animal—condition which may differ entirely when considered under the two professional points of view, that of the doctor of veterinary medicine and that of the doctor of law. These remarks are suggested by an article which I read in the *France Cheraline*, where the decision of a court was given in a horse case. A gentleman had a horse which met with an accident, in which the animal fell down, had his knees broken open, and after some time had such an ugly cicatrix that to be relieved he had to be submitted to the operation for broken knees, invented by a French veterinarian, Mr. Vinsot. This last operation, when properly performed, removes all the ugliness preëxisting and leaves instead a linear cicatrix so perfect that it is almost impossible to detect it, especially when hairs have grown over. This horse was then sold, examined by an authority (a professor in a veterinary school) and passed free from all blemishes. Other

veterinarians examined him later and discovered the cicatrix. The buyer asked the court to decide if he was not justified in returning the horse and getting his money back. The court so decided. It is certainly hard, even if it is just. The accident which gave rise to the original cicatrix did not necessarily imply a defectuous condition of the animal; the almost imperceptible cicatrix of course was there, but was it sufficient to condemn the animal—not as unsound, it is true, but even as a blemished one? My dear colleagues over the Atlantic who have many examinations to make, let me call your special attention to that cicatrix of the Vinsot operation.

* * *

A CHAIR OF DEONTOLOGY.—It may have seemed, well let us say funny, to see in the announcement of one of the veterinary colleges of America, that a chair of deontology had been established. I was personally much pleased when I read that in Philadelphia the new chair had been placed in the hands of Dr. Hoskins. I had made the suggestion years before, and it certainly was gratifying for me to see it inaugurated at last. The same has just been recommended, not only in medical, but in veterinary schools in France. It is suggested that a course of twenty lectures be inaugurated. The recommendation comes after a series of observations made by a veterinarian in which no doubt important breaches of ethics had been committed, not only among veterinarians, between themselves, but in the exercise of their professional capacities, such as the delivery of signed blank certificates, for animals which were supposed to have been examined and had not been visited. Such occurrences have taken place at the frontiers, for instance, where sanitary inspectors are on duty, and are certainly reprehensible in all respects, and it is well that the young generation of veterinarians be educated in the principles which regulate the deontology of all professions, no matter if it is legal or medical, but we believe specially for the veterinary, where so many opportunities may be offered to make one deviate from the straight road, and to forget those professional obligations that one owes

not only to himself, but to his colleagues, to his employer, to his profession, to his country. No, there is nothing funny about it. It may not be a branch of medical knowledge, but one of a higher standing, one which will elevate the individual who possesses it and by him raise the profession to which he belongs.

* * *

A DEBT REPAID.—Several years ago, when the REVIEW was not what it is to-day, I had many occasions to complain of the comparative lack of interest that our colleagues in active practice exhibited towards her. Why don't you write? I used to say. I was urging them with all my might. One day, almost in despair to find a stimulant to obtain records of cases, I read in an English paper, the *Veterinary Record*, if I remember right, a heading to the chapter of records of cases which was printed. I thought the notice good, and inserted it in the REVIEW. Since that day, and ever since, we have obtained from our friends plenty of good records. The notice is there yet, and the cases are still coming—so rapidly that the REVIEW has been forced to double its size to print them.

In a late number of the *Record* there is an editorial headed "The Dearth of 'Clinicals'"—in other words, our friend, DR. W. Hunting, the able editor, complains as I did of scarcity of material—"of a decided falling off in cases," he said, as I did, "yet we know how many good observers there are in the profession, and how many interesting phases of disease are constantly seen"; and, again, "of course, we have no claim upon our readers, save the old one that if we afford matter for them to criticise they might reciprocate by supplying something for the instruction of others"; and, finally, "What a volume of interest the *Record* would be if each of its readers recorded one case every two years."

All that I said years ago. Will the learned editor allow me a suggestion: Print at the head of his department of cases the notice which is on that of the REVIEW, and which, if my memory is not at fault, was borrowed from him years ago, and has done so well in America. A. L.

VOLUME XXVII CLOSED.

With the present number twenty-seven yearly volumes of the AMERICAN VETERINARY REVIEW are completed, and, as has been the unvarying rule for a number of past years, we are again enabled to say that the one just closing has been the largest and best of any. It will be noticed that there have been printed 1256 pages, exceeding the volume immediately preceding it by 56 pages; the 25th by 210, the 24th by 284, the 23d by 330, the 22d by 364, the 21st by 358, the 20th by 368, and so on almost from the beginning. That is say, the profession of America has contributed very liberally the material which has been encompassed in this large volume, and by its financial support has enabled the publishers to reproduce its contributions. We have all been great gainers by this concerted action, for our readers have received monthly a splendid symposium of contemporaneous clinical experience and scientific thought the world over, and the publishers have had the satisfaction of being sponsors for a magazine for which they do not feel called upon to offer any apologies to any one in all the world. It is satisfying, then, to feel that the veterinary profession of the Western Hemisphere has a representative the equal of any in the English tongue, and that it is full of life and vigor, fully alive to the necessity of keeping right in the front rank of thought and action. A short analysis of the contents of Volume XXVII may not be without interest in this connection. During the year, 77 pages were devoted to the interesting letters from the senior editor, in which he depicted the latest advances made in the veterinary centres of Europe, keeping his readers thoroughly posted upon topics of vital importance in the rapidly unfolding discoveries in the fields of bacteriology and sanitary medicine, the latest ideas and facts in therapeutics and surgery—all delightfully interspersed with chatty talks with his friends, his American colleagues. Editorials upon home topics filled 38 pages, and they were devoted mostly to themes concerning the welfare of the profession, attacking evils which threatened or retarded its ever-advancing tread, or the chronic-

ling of items which denote her upward tendency—all tending to do that which will serve best to safeguard her welfare. The department of "Original Articles" has eclipsed all past records, for there were contributed to this volume 543 pages upon the most varied and important subjects. "Reports of Cases" were never more numerous nor valuable, for there were 104 pages, containing 82 different articles, many of which were enlivened by illustrations, which are extremely helpful to the reader in giving him a better understanding of the description furnished. In the judgment of many, this department is the most valuable one in a medical journal, as it is the basis of our real knowledge, coming as it does fresh from the stall of the patient whom we strive to equip ourselves to serve. The REVIEW endeavors to live up to its title, and in order to place its readers in possession, not only of what is transpiring in professional circles at home, but her collaborators have searched the literature of many lands in pursuit of the best thoughts and most valuable occurrences in foreign countries. Thus a reference to the "Index" in this number will show that they have found a great mass of interesting material in the various tongues; for "German Review" contains 24 extracts; "French Review," 46; "English Review," 44; "Italian Review," 39; Belgian Review," 14; "Dutch Review," 4. Although "Review of Biology" has decreased in quantity, there were 3 articles published during the year. Each number of the closing volume contained a department devoted to the interests of the Veterinary Service in the United States Army, which was largely utilized by those most concerned. The REVIEW trusts that some good has been accomplished, and it will continue to offer its pages for the benefit of this arm of the service, which has been earnestly endeavoring to receive a tardy recognition from the Government. There were 41 communications and articles bearing upon the service published in the twelve numbers. "Correspondence" was well patronized by the profession, for there were 16 communications upon all manner of subjects. Never in veterinary journalism, certainly never in this country, were the

various veterinary medical association meetings so thoroughly reported as during the volume now closed. There were 36 associations represented, either in the recording of transactions, or the announcement of approaching meetings, and to do this 73 separate accounts were necessary, consuming 251 pages. These institutions are the bulwark of our progress, and their publication can have no other effect than to spread the best contemporaneous thought. A distinct advance has been made in the quality of these reports, since more space is devoted to the scientific aspect of the proceedings, and less to the routine of the business. Miscellaneous articles are interspersed through the various numbers upon a variety of subjects, while in "News and Items" the personal side of professional life is sought to be kept alive, mingled with paragraphs which are both helpful and curious.

In summing up the vast array of material which has been furnished our readers, we wish to emphasize the fact that it is to the profession as a whole that they are indebted for this precious volume, for without their assistance such a record would be impossible. If the REVIEW in acting as its mouthpiece has met the approbation of the profession, and has served it intelligently and with credit to them, those who have labored so hard to deserve it will feel fully repaid for their efforts.

MERITED RECOGNITION BY CONGRESS.

The veterinary profession will be much pleased to hear that the Congress of the United States has recognized in an unusual manner the invaluable services of the distinguished Chief of the Bureau of Animal Industry, not only by conferring upon him an increase in salary, but attesting through the report of the House Committee on Agriculture its sense of the deep obligation which is due the recipient. The bill has passed the House in this form, and will doubtless receive the concurrence of the Senate, as the tendency in that body is to increase rather than to cut down the appropriations passed by the House. It is not often that Con-

gress makes such a personal distinction in increasing a salary, and it is all the more glorious since Dr. Salmon is not a politician, and the proposed action is purely a testimonial to his good work and worth. We understand that the recommendation proceeded from the office of the Secretary of Agriculture, without the knowledge of the Chief of the Bureau.

The reference of the Committee on Agriculture to the incident is as follows:

"There are but two actual increases in the statutory salaries and these are not made permanent, viz., $500 to the Chief of the Bureau of Animal Industry, and $500 to the Chief of the Division of Entomology. These increases are in the nature of 'additional compensation' only while the offices are held by the present incumbents, and are considered by your committee as a just recognition of very efficient service rendered by these gentlemen at a time when great industries of this country were very seriously threatened, viz., the great meat industry by the foot-and-mouth disease, and the great cotton industry by the cotton-boll weevil."

WINNER OF THE DOUGHERTY PRIZE.

As the forms were closing for the present number, we received the decision of the judges—Profs. W. L. Williams, James L. Robertson, and Joseph Hughes—as to their estimates of the merits of the essays published in the December and January numbers of the REVIEW in competition for the prize offered by Dr. Wm. Dougherty, of Baltimore, Md., for the best short essay upon the "crab" or "forger," to be competed for as per conditions published in the October REVIEW, page 628. By a majority vote the prize is awarded to "No. Five," and upon referring to the name attached to this essay we find the writer to be Dr. F. C. Grenside, of New York City.

A RECENT work on engineering states that a horse can pull on the worst earth road three times the weight he can carry on his back, on a macadamized road nine times and on asphalt pavement thirty-five times the weight.

ORIGINAL ARTICLES.

CALCIUM SULPHIDE IN THE TREATMENT OF POLL-EVIL AND FISTULOUS WITHERS.*

By Bert Raymond Wilbur, D. V. M., Randolph, N. Y.

Calcium sulphide or sulphuretted lime is a pale gray powder, exhaling a strong odor of hydrogen sulphide, and having an offensive alkaline taste and reaction. It is insoluble in alcohol, very slightly soluble in cold water, and is decomposed by boiling water.

As the salt readily deteriorates and decomposes from exposure to air, it should be kept in tightly sealed containers and should not, therefore, be dispensed in the form of powders with the expectation of obtaining complete and satisfactory results.

In 1869 Dr. Ringer claimed for the sulphides, and for this preparation particularly, the power of arresting suppuration. He recommended the use of one grain of calcium sulphide in eight ounces of water and a teaspoonful of the solution to be taken every hour. To this was ascribed the cure of scrofulous and tuberculous abscesses in human practice.

Its use in human medicine is very extensive and seems to have found considerable favor. It has been described as the best anti-suppurant known, where the condition is not due to syphilis. The mucous membranes being influenced by it and suppurative action checked, as in the early purulent stages of bronchitis and pneumonia, also in nasal catarrh where the secretion is abundant with a tendency toward purulency. As a remedy for successive crops of boils, it is said no agent is superior.

The influence of calcium sulphide, on the suppurative process, is described by Dr. Ringer as follows: "A thin, watery, unhealthful discharge becomes, at first, more abundant, then diminishes and becomes thicker and healthier, like 'laudable pus': the condition of the sore improving correspondingly, its

* Abstract of a Thesis presented for the degree D. V. M. at the New York State Veterinary College, Ithaca, N. Y., June, 1903.

healing, the while, being promoted. In some cases, any pain that exists is temporarily aggravated, but as a rule, it is speedily mitigated. The general health improves and the debility and feeling of uneasiness and discomfort, so frequently attending these maladies, promptly passes away."

According to Shaller, "the drug is decomposed in the body, the sulphate of calcium passing out in the fæces, and the sulphuretted hydrogen after absorption into the blood is eliminated by the skin and lungs. Because of this elimination by the lungs, this drug produces excellent results in diseases of the bronchial tubes, where the sputum is scanty and tough and where the cough is distressing."

So far as I have been able to find, there are no recorded cases of its use in English veterinary literature, except a few cases recorded in Dr. Law's work on Veterinary Medicine. It is recommended in this work, in cases of purulent nephritis and in inflammation of the renal pelvis. Dr. Law gives one case of an old standing quittor where its administration internally effected a speedy cure. He also recommends it in cases of furunculosis or boils occurring on the digital regions of horses in winter, or where the parts are exposed to street mud containing an abundance of decomposing organic material. In these cases the sulphide was given internally combined with local applications of phenol or tincture of iodine.

The use of calcium sulphide in this research was confined to the treatment of poll-evil and fistulous withers only. In all, seventeen subjects were experimented upon, a few of these (four or five) were not suffering from acute disease but were experimented upon to determine the proper physiological dosage. Doses ranging from five grains to two ounces were tried with varying results. Many of the diseased cases were not under my complete control and received other internal treatment which, within certain limits, rendered the sulphide treatment unreliable. Therapeutic doses have no marked effect upon the pulse, respiration and temperature.

Case one, patient, a black mare weighing about 1050 pounds.

When brought to the clinic there was a fistula on the side of the withers discharging quite freely. The tract was laid open freely and continuous irrigation kept up for several days, in order to allay the inflammation and to get disinfection. After a week the administration of the sulphide was begun, two drachms being given three times a day. Later on, an ounce dose daily was given and still later a two ounce dose daily was administered. The discharge from the wound was quite excessive and a new pocket of pus had developed. The patient ate well while receiving the large doses and the general health did not seem to be affected. The sulphide was also applied locally to the wound, but this seemed to increase the discharge. The medicine was withheld for a week and then resumed in ounce doses. Another pocket of pus had developed in the meantime and this was opened and thoroughly cleaned. Some days later there was still quite a free discharge but the wound was healing slowly. The patient was under observation thirty-nine days. During this time there were no very marked changes in the respiration, pulse nor temperature. The lowest number of respirations recorded were 8, the highest 18; the lowest pulse record was 38, the highest 56; the lowest temperature was 98.4°, and the highest 101.8°. These variations were due not merely to the dosage, but in part at least to a variation in the condition of the animal as a result of the disease. It was observed that no digestive disturbances appeared as a result of the large doses, which seems to be contrary to the experience in human medicine.

Cases two, three and four were of a similar character, except that they received a uniform dosage of fifteen grains of calcium sulphide three times a day. Case three was a cow and was discharged after twenty-three days, but later on was returned for further treatment. Cases two and four were horses and were under observation for thirty-seven and thirty-three days respectively. Potassium iodide was also given internally. In both of these cases it was found that the pus had burrowed a second time after the treatment had begun.

Cases five to eleven inclusive were not diseased but were used solely for experimental dosage. Three of the horses received one drachm doses of the sulphide three times daily. In one of them the temperature and pulse increased slightly above normal; in the other two the temperature and pulse were slightly decreased. In another horse receiving one drachm once a day there was a slight rise in temperature and pulse; but in another horse receiving a half-drachm dose once daily there was a slight decrease. The two remaining horses in this series received five and fifteen grain doses respectively of the sulphide once daily. The temperature, pulse and respiration remaining within normal limits. Although an increase and decrease is referred to above, the variations from normal were very slight.

Case twelve was a sorrel mare weighing about 1000 pounds. This case was purely experimental, the aim being to produce the disease and begin treatment early in the course. Some pus was collected from a patient suffering from poll-evil. Bouillon cultures were made from the pus and 3.5 c.c. of a one-day-old culture were inoculated over the region of the poll of the mare, but a little to one side of the median line. Due antiseptic precautions were taken in collecting the pus and making the inoculation. The day after the inoculation a large tender swelling appeared at the point of inoculation. The mare's appetite declined and the swelling increased in size. The neck became somewhat stiffened and there was evidence of increasing tenderness over the poll. Six days after the inoculation five grain doses of the calcium sulphide were given twice daily. The swelling remained at about the same size but there was evidence of less soreness and the patient ate freely. After five days the dose was raised to ten grains twice daily and three days later fifteen grain doses were given. There was less stiffness of the neck and no increase in the size of the swelling, although it was still quite sore. Sixteen days after the inoculation, a thin watery fluid was discharged from the swelling and a day later a thick creamy pus appeared. On examination it was found that nearly the entire surface of the swelling was necrotic

and the hair upon this surface was loose and easily removed. The mare was confined in the stocks and the abscess freely opened, discharging a half pint of pus. On probing, a fistula was revealed running down the side of the neck, for a distance of five or six inches. The silver probe used in exploring the abscess became considerably blackened, indicating the presence of sulphuretted hydrogen from the calcium sulphide which had been administered.

As much pus and necrotic tissue as possible were removed involving a total area of six or eight square inches. A ring of hair, one or two inches in width, was removed around this area, the hair coming out quite easily. After securing efficient drainage the wound was carefully disinfected and dressed with a pack soaked in a solution of lysol. Subsequent dressings consisted of injections and washings with a solution of echafolta. Internal treatment with calcium sulphide was kept up and in two weeks recovery was complete. During treatment the lowest pulse was 40 and the highest 60. The lowest temperature was 99° and the highest 103°.

Case thirteen was a control of the previous case. This subject was inoculated with the same amount of bouillon culture as case twelve. The swelling appeared the next day and general symptoms coincided closely with those of the previous case. After two weeks the subject was killed and about half a pint of partly inspissated pus was obtained from the abscess. In neither of these two cases was the ligamentum nuchæ involved. Case thirteen received no treatment whatever. At the time of killing there was no indication of *pointing* in the abscess and the pus was less fluid than in number twelve. The inference is that the calcium sulphide, in the previous case, hastened the ripening of the abscess (which was discharging after sixteen days) and stimulated the healing process.

Cases fourteen, fifteen, sixteen and seventeen were regular patients at the clinic and received ten grain doses of calcium sulphide twice daily, except number fifteen, which received a twenty grain dose once a day. This patient also received potas-

sium iodide internally. Two of these cases had received previous treatment outside of the clinic, without success, but yielded readily to the combined local and internal treatment. Case seventeen was under observation one week, but was sent home before complete recovery with directions to the owner as to proper treatment. This was not carried out and the patient was returned later in poor condition and with new pockets of pus forming. The calcium sulphide had been administered but the local treatment had been neglected. This case is cited to emphasize the desirability of maintaining good local treatment. The evidence that the quickest results may be obtained by the proper combination of the two.

As a summary of the observations taken during this work it would appear: 1. Doses of calcium sulphide larger than ten or fifteen grains twice daily tend to increase the discharge and perhaps hinder the healing process. 2. Large doses disturb the temperature and pulse. 3. Large doses, even as high as two ounces daily, do not appear to cause derangement of the digestive system in the horse. 4. Calcium sulphide locally applied increases the discharge. 5. The best effects are obtained when calcium sulphide is used without the administration of other drugs. 6. The administration of small doses of the sulphide (10 grains) appears to lessen the discharge and prevent the burrowing of the pus. 7. Good local treatment is essential, by freely opening the the fistulæ and keeping the wound thoroughly disinfected. 8. A convenient method to administer the drug is in gelatin capsules of the proper size. These protect the drug from the air and will be readily taken by the horse when given with moistened feed. 9. It is best not to administer the drug until the fever caused by the operation has subsided. 10. The patients do not appear to lose condition during the treatment, but tend to increase in flesh. 11. Without a good quality of the drug, no good results can be obtained. Calcium sulphide rapidly loses its properties when exposed to the air.

Acknowledgments for advice and suggestions are due to Drs. Fish, Law, Williams and Hopkins.

IMMUNIZATION AND ITS PRACTICAL APPLICATION.

By L. Van Es, M. D., V. S., State Veterinarian, Fargo, North Dakota.

A Paper presented at the Meeting of the North Dakota Veterinary Association at Grand Forks, Jan. 12, 1904.

Of all the factors which have given the veterinarian a place among the professions, there is none which can equal the importance of the prevention of the microbic diseases.

Of course, a skilful surgeon will always be admired, the services of one who is successful in the treatment of internal diseases will ever be in demand, but at no time is veterinary aid of more value than when a country's wealth of live stock is threatened by some of the communicable diseases. The amount of money saved in that respect, since the profession has been placed on a rational and intelligent footing, is of enormous proportions, and yet science is almost daily widening this sphere of usefulness.

In this great work practical immunization occupies a place only second in importance to the enforcement of sanitary measures, and a short review of its applications and the principles involved will not be out of place at this gathering. The methods of preparing the materials used may also be of some interest, as I fear that this part of veterinary pharmacy and materia medica is frequently neglected by our practitioners.

While processes of immunization are coming more and more into use in medicine, they have nowhere reached a higher degree of usefulness, or are employed more extensively and successfully than by the veterinary branch of the profession.

Immunity has been explained in various ways, but with all the causes summed up, it has not been possible to hit upon the underlying principle in a manner which will set aside all doubt. It is, however, not improbable that immunity will be explained entirely on a chemical basis. It is needless to say, that when speaking of immunization, reference is made to the establishment of acquired immunity. It was noted, long before one had

thought of making practical use of it, that one attack of a certain disease conferred immunity for a time or forever a protection against the same disease. This phenomenon is very marked in Texas fever of cattle and in yellow fever of man. In the majority of methods, used with a view of bringing about artificial immunity, this knowledge serves as a base. In such immunization, we simply cause the animal to have the disease against which we wish to protect it, but by the use of special methods we limit the severity of the attack within such boundaries that fatal results do not occur or are so rare that they are greatly outweighed by the advantage gained. As will be seen later non-fatal attacks can be induced by the inoculation with cultures of the specific microörganisms or with the bacterial poisons or toxins developed in live or artificial culture media.

Another method which, however, must be considered to be in the experimental stage, depends on the introduction of active antitoxines, which are usually obtained from highly immunized animals.

In veterinary practice its uses are yet very limited, but there is no denying that the method is sufficiently promising to induce scientists to further experimentation and to cause practitioners to watch with care the results of the same.

Artificial as well as natural immunity is specifically limited. Immunity conferred against anthrax affords no protection against black-leg. An animal being immunized against Texas fever by having had the disease is by no means proof against anthrax. In cases where immunity is conferred by the blood serum of hyper-immunized animals the same rule holds good. The same animal, however, may be immunized against several diseases and it has been demonstrated by laboratory experiments that the blood serum of such animals is protective against the same diseases, when injected into other individuals.

To a limited extent immunity is hereditary, it being conveyed by the mother's blood. It is, however, not lasting, as the antitoxic principles are soon eliminated from the organism of the young. The experiments of Ehrlich have shown that im-

munity is transmitted by the milk of immune mothers and in this way the congenital immunity is being strengthened. It is not impossible that those facts have some bearing on the resistance shown by sucking calves against Texas fever infection. While calves are by no means absolutely immune they certainly do not succumb to the disease like animals of more advanced age. While practicing in the South, I have seen little calves from non-immune mothers die of the disease, but never witnessed a fatality in those of immune cows.

The oldest method of immunization is that of vaccination against small-pox, in which cow-pox material is capable of protecting man against variola. As long as the etiology of small-pox remains a problem, it will be difficult to explain this phenomenon, but it seems probable that cow-pox is identical to variola, but that by passing through generation after generation of cattle its virus has become so attenuated as to be no longer capable of producing serious disease in man. The light form of small-pox or vaccinia, however, establishes a high degree of immunity.

Perhaps the earliest application of practical immunization of animals was made with a view of checking the ravages of anthrax. In this disease a temporary immunity is secured by the inoculation with attenuated virus, with soluble bacterial products and perhaps also with serum from immunized animals.

The weakening of the virus may be accomplished in various ways, viz.: 1st, by action of heat; 2d, of antiseptics; 3d, of the oxygen of air; 4th, by oxygen under pressure.

The first successful attenuation of the anthrax bacilli was obtained by Toussaint, who exposed defibrinated anthrax blood during ten minutes to a temperature of 55 degrees C, and found that sheep, which received 3 c.c. of this liquid proved to be resistent to a subsequent inoculation with virulent material.

Chauveau continued in this direction and studied the effect of high temperatures not only on anthrax blood but also on cultures in artificial media and by incubation at an initial temperature of 42 and later on heated to 47 degrees for three hours suc-

ceeded in getting a virus which was no longer capable of killing guinea-pigs. He found, however, that when this culture was developed further at a temperature of 37 degrees that the virulence returned. After considerable experimentation he established a method by which a more or less permanent, or rather hereditary attenuation could be secured. The bacillus taken from virulent blood is grown for 24 hours at 42.5, then for three hours at 47 degrees. By reducing the temperature to 37 degrees, spores of a reduced virulence are produced. This culture is now heated for one hour to a temperature of 80 degrees to 84 degrees C, when a truly attenuated virus is obtained.

Roux and Chamberland found that the addition of certain antiseptics has an attenuating effect on anthrax cultures. Bouillon cultures containing a proportion of 1–1200 to 1–600 of carbolic acid gradually lose their virulence. Such a culture when twelve days old is still capable of killing rabbits and guinea-pigs, but those animals experienced no inconvenience when inoculated with a similar culture of 29 days old. Bichromate of potash (1–2000–5000) and sulphuric acid (1–200) have similar tendencies.

It is, however, doubtful if this method of attenuation could be depended on in practice, as new varieties of bacilli seem to develop, which may have lost some of their disease-producing qualities in one animal species, while in another species may be found to be extremely virulent.

Pasteur, Chamberland and Roux experimented in order to produce an attenuated virus by contact with air, but met a serious obstacle in sporulation of the bacillus. The spores are not affected by a mere contact with air. By cultivating, however, at 42 or 43 degrees C. no spores are formed, and a gradual attenuation of the bacteria takes place. Such cultures when twelve days old are harmless to guinea-pigs; when thirty-one days old they kill mice but are resisted by guinea-pigs and rabbits, and when forty-three days old it is no longer virulent to the smallest animals.

When again grown at 37 or 38 degrees C., spores are formed

which have the same virulence as the bacilli from which they are grown. In making the cultures, a maximum amount of culture surface should be in contact with the air.

When anthrax bacilli are grown in an atmosphere of compressed oxygen a reduction in virulence takes place. Chauveau found that cultures grown for four generations at 38 degrees under an air pressure of 117.6 pounds per square inch, were harmless to sheep but were yet capable of killing guinea-pigs. The fourth generation grown under a pressure of 132.3 pounds per square inch no longer killed guinea-pigs. The attenuation thus obtained is practically hereditary, while the virulence slightly increases, it never reaches the point of being dangerous to sheep. When pure oxygen is used, a lesser pressure and a shorter period of growth are required to bring about the desired reduction in virulence. In those experiments it was possible to entirely deprive anthrax bacilli of their virulence and it was shown that such cultures were still able to confer immunity.

In practice, cultures attenuated in the manner described are almost exclusively used. From the above may be concluded that we may select any degree of attenuation which may make inoculation a safe procedure. It must, however, not be forgotten that the more virulent the vaccine used, the more lasting and certain will be the immunity conferred.

The vaccine most commonly used is the one prepared according to the method of Pasteur, Chamberland and Roux.

In immunization by this virus two vaccinations are regarded as necessary. The first vaccine is a greatly attenuated culture, while the second vaccine, which is applied twelve to fifteen days later, consists of a virus in which a certain degree of virulence is retained. For this reason it will be needless to caution against the use of second vaccine before the first one has been given. Of the vaccine prepared by Pasteur's method $\frac{1}{8}$ c.c. is the required dose for adult sheep and $\frac{1}{4}$ c.c. for horses, mules and cattle. It is applied as an ordinary hypodermic injection, selecting in cattle the region behind the shoulder, in horses the sides of the neck, and in sheep the inner side of the thigh.

As a rule the vaccination is not followed by any apparent consequences. Sometimes local swellings may be observed and a few accidental losses have also been observed.

Such losses, however, are slight compared with those experienced in "anthrax countries" before vaccination was extensively practiced. In certain regions cattle and sheep raising would be impossible were it not for this process of immunization.

The immunity obtained in this manner is considered to be complete some fifteen days after receiving the second vaccine, and while its duration may vary in different individuals, we may regard one year as the period of safety.

In anthrax regions it is advisable to practice vaccination in the spring.

In Chili, immunization is produced by the use of a virus prepared by Chauveau's method (cultures grown in an atmosphere of compressed oxygen). By this method only one inoculation is required (dose $\frac{1}{20}$ c.c. for sheep and $\frac{1}{10}$ c.c. for cattle). The results obtained are excellent in cattle, less so in sheep.

While the preceding methods of immunization are those most commonly employed, some interesting results were obtained by the use of toxines produced by the anthrax bacillus.

Professor Law of Cornell University, sterilized anthrax blood by heat (212 degrees) extracted the toxines with water and apparently established immunity by injecting from 2–4 c.c. of this solution. In other hands this method was not quite as successful, but this may be due to the fact that some of the toxines were rendered insoluble by the great heat used in sterilization.

Roux and Chamberland at least obtained promising results by using fractional sterilization at 58 degrees C.

If a method of immunization could be developed along those lines, it certainly would have the advantage of doing away with the use of living cultures. It is possible that by the use of blood serum from hyper-immunized animals, immunity may be established. It will, however, require a large amount of experimentation before a definite method can be developed on this plan.

In black-leg various methods of immunization can be resorted to, although in this country only one protective virus is generally employed.

Immunity is established by active virus, attenuated virus, by the toxines of the specific organism and by serum of immunized animals.

Immunization by the inoculation with an active virus, perhaps, will never be seriously considered in practice as it is not free from danger and is always accompanied by a certain element of risk.

The virus used in this method is the serum obtained from the specific swellings. The dose used is 4–6 c.c. in cattle and 1–2 c.c. in sheep, and must be applied intravenously, as the least infection of the subcutaneous tissue may have very disastrous results.

Thomas, however, obtained good results by the insertion of a thread soaked with virulent material into the subcutaneous tissue of the tail. It is to be presumed that the amount of virus is exceedingly small.

Vaccination with attenuated virus is most extensively used in this country and abroad. Modified virus is obtained by various methods which largely depend on the same principle, namely, the action of the high temperature on the disease-producing qualities of the microörganism.

Arloing, Cornevin and Thomas rubbed up a piece of black-leg swelling in a mortar with a small quantity of water. The resulting mass was then filtered through fine muslin and the liquid is spread in a thin layer on a plate or piece of glass. This is placed in a drying oven at 37 degrees C. It is kept here until perfectly dry. The resulting powder retains its virulence indefinitely.

From this virulent powder, the authors mentioned, prepare a first and second vaccine. In order to do so the powder is mixed with water in the proportion of one to two, and the liquid is divided into two equal parts. One part is heated to 100 degrees to 104 degrees C for seven hours, and constitutes the first

vaccine. The other half is heated in a similar manner to 90 degrees to 94 degrees C and forms the second vaccine. The resulting dry scales contain spores of a modified virulence and before being issued for use must be pulverized to the required fineness.

Kitt has improved upon this method and prepared a virus of which one inoculation is sufficient to obtain immunity. This vaccine is made like the preceding, but is subjected to only one heating, viz.: for 5½ to 6 hours to a temperature of 98 to 100 degrees in a steam sterilizer.

Nörgaard, of our own Bureau of Animal Industry, employs the same method, but heats only to 93 to 94 degrees.

Leclainche and Vallee use bouillon cultures of five to eight days old and heat them to 70 degrees during two hours. One c.c. of this heated virus injected hypodermically constitutes a first vaccine. Seven days later they receive 2 c.c. of a virulent culture, after which they are said to be absolutely immune.

Immunization by toxines has not yet been introduced into practice, although laboratory experiments were made by Roux, which seem to indicate that their success is by no means out of the question. The success of other methods perhaps is responsible for Roux's methods not being further developed.

The same can perhaps be said of the use of antitoxic serum, which was first tried by Kitt. It is to be hoped, however, that the experiments of Roux and Kitt will ultimately yield some practical results, as it cannot be denied that processes of immunization with non-virulent material will always have a great advantage over the use of living virus.

The method of black-leg vaccination most generally in use in this country is perhaps the most practical one. It consists of the simple hypodermic injection of a certain amount of virus suspended in water. The virus as issued by the Bureau of Animal Industry is prepared according to Kitt-Nörgaard method, and although the distribution of it is merely conducted for experimental purposes, the saving of live stock will amount to many millions of dollars.

Other methods are also employed, but as they are all very similar in principle, they will not require special mention.

Immunization against Texas fever is accomplished in this country by the injection of defibrinated blood derived from an immune animal.

The method usually employed, is the following: Under the necessary aseptic precautions a quantity of blood is drawn from the jugular vein of an immune animal by means of a trocar and collected in a sterilized beaker. The blood is now defibrinated by means of stirring it with a glass rod. The fibrine collects on the rod and is shaken off until it has all been removed. The blood is now drawn into a hypodermic syringe and one c.c. of it is injected into the animal to be immunized.

It is recommended to keep the blood warm and not to use it until after it has been drawn for one hour.

This inoculation is followed in non-immune animals in from 6 to 10 days by a rise in temperature amounting to 103 to 106 degrees F, and this fever may continue for several days.

In a number of cases a secondary fever occurs, but the appearance of the febrile stage is not constant. A second inoculation of 2 c.c. of blood is made after the animal has recovered from its first attack of fever. The last injection is usually followed by a very mild type of fever after which immunity may be considered as being established. It is always safer to make such inoculations during cool weather.

Another method sometimes employed in this disease is by infesting calves with a small quantity, say from 25 to 50 ticks. In due course of time this is followed by a febrile attack. When recovery from this has taken place, a larger number of ticks—200 to 400—are placed on the animal in order to establish a higher degree of immunity. This is very slowly established and is sometimes not completed for months.

The good results obtained with the preceding method by Francis, Conaway, Cary, Dalrymple and others seem to recommend it over the tick method.

Immunity against tetanus may be secured by the inocula-

tion with cultures of the tetanus bacilli, with toxines and with anti-toxines. The first method is but little in use and is at present of no practical importance. When old cultures from which the bacteria have been eliminated are injected into an animal from time to time in increasing doses, immunity may be established, especially if the toxines are mixed with a solution of 1–500 of tri-chloride of iodine.

The blood serum from immunized animals contains tetanic antitoxines, and has itself immunizing properties.

When an animal has been so highly immunized that it can bear large amounts of toxine with impunity, its serum can be used for immunization.

From the experiments of Nocard we learn that tetanus may be absolutely prevented by this method of immunization.

In contagious pleuro-pneumonia, immunization is secured by the subcutaneous inoculation of pulmonary exudate and by means of a protective serum.

As far back as 1850 Willems inoculated against this disease, using the serum which oozes from an affected lung. He selected the end of the tail as the seat of inoculation. This was done that in case of too great a reaction, gangrene, etc., the part could be readily amputated.

Nocard in experiments of a more recent date found that inoculation with virulent cultures leads to the same result.

By both methods immunity is established very slowly.

Immunization by protective serum, while proven to be possible, has not been introduced in practice.

The devastation produced by cattle plague has naturally excited a great demand for some reliable method of immunization; and although Koch himself is working on the problem, a rational method has not yet been found. Some result, however, has been obtained. The method which thus far has given some degree of satisfaction is the injection of bile of animals dead with the disease. Koch found that the Boers of Transvaal and Orange Free State employed this method in 1896 and outlined an immunization process based upon it.

Animals which received hypodermically 10 c.c. of fresh bile derived from an animal dead with the disease, withstood after a lapse of ten days an inoculation with virulent blood. The results obtained in practice were very variable and showed that this method was not absolutely safe. Koch advocates the use of a mixture of bile and virulent blood, but the immunity secured is of very short duration. In spite of some bad results by those methods, an enormous amount in animals have been saved by it in South Africa.

In foot-and-mouth disease, immunization, although attempted, has not been successful.

Against swine erysipelas, a disease yet of little interest to American veterinarians, immunization is extensively used in those countries in which it prevails. It is brought about by the use of attenuated virus, by toxines and by anti-toxines.

Pasteur showed that the specific organism, when transferred from rabbit to rabbit rapidly increased in virulence, but the more fatal it became to rabbits the less so it became to swine.

In this way a virus of a given strength can be obtained with immunizing properties. For the sake of safety, a very weak culture is first injected and stronger virus is inoculated 12 or 15 days later. The immunity thus obtained lasts about one year.

Lorenz secured immunity against this disease by employing sterilized cultures, but in practice the method turned out to be a failure.

The same author, however, was more successful in the use of a serum, which seems to produce a passive immunity. This is followed 12 to 15 days later by a vaccine of some virulence.

Since 1880, Pasteur has been able to attenuate the microörganisms of chicken cholera by exposing cultures on a slightly alkaline solid medium. He also observed that cultures, which had undergone a certain degree of attenuation, when transplanted on new media preserved the same degree of attenuation. This weakened virus, when inoculated in susceptible animals has, however, an immunizing effect. In immunization by this method two vaccines are used. As first vaccine a very weak

virus is employed, and this is followed 12 days later by a virulent or a slightly weakened culture. The virus is applied with a hypodermic syringe and given in doses of 1/8 c.c. In spite of the efficiency of this vaccine, its use has never become very extensive.

There are few achievements in applied hygiene which have been received more gratefully than the discovery of an immunization method against rabies, and there are but few lines of research which are more interesting than those dealing with experimental vaccination against this disease.

Galtier injected virulent saliva into the jugular of seven sheep without producing rabies, and when one of the sheep was later on inoculated with the saliva of a mad dog, it appeared to be immune. He later on reports the same results in nine sheep and one horse.

Nocard and Roux repeated those experiments with virulent brain tissues and obtained the same results as Galtier.

The application of this method showed favorable results in sheep, goats, cattle and horses. In the first three species mentioned, immunity may be secured when the injection is made within two days after the animals have been bitten. It is less satisfactory in horses.

It seems that those experiments point to something promising in veterinary practice. If a number of sheep or cattle have been bitten, and if the original rabic animal can be secured, intravenous injection of freshly prepared virus may be instrumental in reducing the high mortality. In fact the method has been applied by Nocard with encouraging results. The technique is as follows: virulent material (preferably the medulla oblongata) is rubbed with some water in a mortar under the best aseptic conditions possible, and is then strained through a fine cloth. Of the milky liquid, cattle receive 10 to 15 c.c. and sheep 4 to 6 c.c. into the jugular. In this manipulation care must be taken that no material is introduced into the subcutaneous tissue or in the wall of the vein, as such an accident would have the same consequences as a rabid bite. The needle therefore should be introduced into the vein first, the syringe being attached when

the flow of venous blood shows that the vein has been penetrated. After the inoculation, the animals should be kept quietly in a stable for a month at least.

Pasteur has shown that when the virus of rabies is passed through monkeys it undergoes a certain attenuation and that dogs could be immunized with such virus.

In 1885 Pasteur, Chamberland and Roux announced that virulent medullæ when exposed to a drying process gradually lose their virulence and that repeated inoculations with an emulsion of dried material confer immunity.

On their observations is based the Pasteur treatment by which immunity can be established before the period of incubation, in the persons bitten, has ended. In the Pasteur treatment emulsions of increasing virulence are employed, the degree of virulence being regulated by the length of the drying process.

The use of virus heated to 58 degrees C. has also given very good results in man, while the inoculation of diluted virus has not passed the experimental stage.

Behring is at the present time engaged in an experiment which promises results, of which the value cannot be sufficiently appreciated, namely the immunization against tuberculosis. His work at the present time is confined to the immunization of cattle, and the results obtained thus far indicate the ultimate success of his method.

It has been found by all who ever worked with the tubercle microörganism that it gradually loses its virulence when kept under cultivation on artificial media for a long time. When one milligramme of an old culture on serum is injected into the jugular vein of a calf of 5 to 7 months old, the animal is able to resist one month later a dose 25 times greater.

The usefulness of Behring's method is now being tested on a large scale and it will be interesting to watch the results.

De Schweinitz and Schroeder, of the Bureau of Animal Industry, recently published some of their observations with this method and showed that the immunizing bacteria remained intact for considerable time.

While they apparently obtained immunity, they caution against the general application of a method by which living bacilli are so long preserved in the tissues.

The inoculation with tuberculine or sterilized cultures of the tubercle bacillus does not result in immunity. The same can be said of the use of antitoxic serum.

In dealing with glanders all attempts at immunization have thus far failed. This is probably due to the difficulty met in attenuating the specific bacterium sufficiently so as to allow its injection into susceptible animals.

WEST BOWEN, an old-time "veterinary" of Brooklyn, N. Y., died last month following a stroke of apoplexy a month previously, aged 82 years. He began practice in Brooklyn just after the Civil War, having served throughout that conflict. A generation ago the deceased enjoyed quite a lucrative practice, but his profligate habits and "sporty" proclivities gradually destroyed his opportunities and estranged him from his family, which was quite well-to-do and eminently respectable. At the time of his last illness he lived in a dirty room in a stable which had been his "hospital" for many years, the only furniture adorning his apartment being a bed, a chair, and a stove without a chimney. West Bowen was a celebrated character and local sport for many years, but he possessed but little ability as a veterinarian. His name frequently figured in the newspapers, and an interwiew which appeared in the New York *Journal* some years ago was fairly illustrative of the quality of his veterinary attainments. The reporter remarked to him that in his long career he must have gathered a great deal of information regarding the horse, to which the doctor thoroughly agreed. The interviewer further said: "Doctor, you must know every bone and muscle in the horse." To this he again acquiesced. "Doctor, how many bones are there in a horse?" "Why," said Bowen, "that depends on how big he is." Bowen kept hanging in his office two lumbar vetebræ from a horse, which he proudly exhibited to all who visited him, explaining that he had removed them from a patient because he was too long-coupled, saying: "He was too long, too long. I just shoved him up a little." To make the story more convincing he declared that the horse was working every day, and he volunteered to show the animal to any one who might doubt his statement.

THE LATEST OBSERVATIONS AND EXPERIMENTS ON THE TRANSMISSION OF BOVINE TUBERCULOSIS.

By D. Arthur Hughes, Ph. D., D. V. M., Cornell University; Government Inspector, East St. Louis, Ill.

I. TRANSMISSION OF BOVINE TUBERCULOSIS TO MAN.

Though it is gravely to be doubted whether the latest observations and experiments on the transmission of bovine tuberculosis to man are of any intrinsic value in themselves, yet the account of them will inform us of what work has been attempted, and the recent thought offered in explanation of results. Men's fears often lead them to jump, in a womanish way, to the wildest conclusions. There cannot be any greater fear than that of the possible encroachment of bovine tuberculosis upon man. It seems likely that such an infection is possible; hence it behooves us, as veterinarians, to look to the public welfare in this matter. Still, as yet, there is no proof, worthy of the name; no sufficient data, from which scientific men, as a body, can conclude absolutely that bovine tuberculosis to a certainty harmfully infects man. If bovine tuberculosis is of great danger to the very life of man, as future research may prove, the experiments conducted and the observations made during the last two years do not help us much in proving it.

(1) *The communication of bovine tuberculosis to man through wound infection.*

A number of such wound infections have been discussed during the last year or two by writers abroad and at home. C. H. H. Spronk and K. Haefnagel (*La Semaine Méd.*, Paris. Ann. 22, No. 42; Oct. 15, P. 341–343) reported the case of a butcher accidentally wounded May, 1900, in the finger while assisting in inspecting the tuberculous organs of a cow. The wound healed promptly, but later the finger presented evidence of infection. In February, 1902, Professor Nareth extirpated the affected portion of the skin, together with the tumefied cubital ganglia. The tuberculous character of the lesions was

demonstrated by microscopic examination and by inoculation of guinea-pigs, and an emulsion made from the spleen of one of these pigs was used to inoculate a calf previously tested with tuberculin, and the animal placed in a newly constructed stable, with the result of producing general tuberculosis as demonstrated by the presence of giant cells and numerous tubercle bacilli. Finally two guinea-pigs which had been inoculated with material obtained from this calf, died of tuberculosis.

Krause (vid. Salmon, Amer. Public Health Assoc. Report, 1903), reports the case of a butcher, aged thirty, with a good family history, whose duty it was to remove diseased parts of cattle killed for food. The infection was located in the right arm, and was attributed by the man to a splinter of wood run into the right thumb three years ago. Immediately after the accident he had removed the hide from a sick cow. Pieces of gland and skin from the arm proved on examination to be tuberculous.

Lassar ("Ueber Impfluberkulose," *Deutsche Med. Woch.*, No. 40, Oct. 2, 1902, pp. 716–718) reports thirty-four cases of verrucose tuberculosis following wounds in 108,000 patients, but only four of these were butchers. Later he examined 365 men employed in abattoirs and found seven suffering from inoculated tuberculosis, while three others he considered as possibly affected.

In America, Professor Ravenel, of the University of Pennsylvania, reported four cases of verrucose tuberculosis of bovine origin (*Medicine*, Detroit, July, August, 1902. Transactions of the British Congress on Tuberculosis, July, 1901, Vol. I., pp. 91–92).

(2) *Wound infection followed by generalized tuberculosis.*

In no one of the recent cases cited above from foreign and American scientific literature, is it stated that the wound infection resulted in anything more serious than entirely localized tuberculosis verrucosa cutis. Such cases can have very little value except to the dermatologist. It is only when it can be proved that tuberculosis verrucosa cutis is an incipient tuberculosis pointing to an oncoming generalized tuberculosis; or when

it can be shown that generalized tuberculosis ensued from wound infection that such cases become of moment to the veterinarian or sanitarian. One case is reported recently which seems to point to a generalized tuberculosis resulting from wound infection.

Troje (*Deut. Med. Woch.*, March 12, 1903) reports the case of a young, healthy male, who gave no personal or hereditary history of tuberculosis. He was inoculated with bovine tuberculosis in the hand, and a typical lupus lesion developed on the site of inoculation. Subsequently the lymphatic glands which drain the involved region became tuberculous, and in course of time many other lymphatic glands throughout the body became similarly infected.

Few such cases have been reported in medical literature at any time; and it well may be doubted whether the fallacy *post hoc, ergo propter hoc* has not crept in here. How are we to know, for instance, that tuberculosis of the glands in this case was not a "natural" infection and not a result of wound infection, through the lungs or another channel instead of the capillaries or lymphatics of the skin? Such is the ignorance of bacteriologists at present on the differentiation between the bacilli of bovine and human tuberculosis that doubt must always be admitted. Because generalized tuberculosis follows a wound infection caused by bovine tuberculosis in nowise proves the wound-infection the cause of the generalized tuberculosis.

(3) *Reported transmission of bovine tuberculosis to man through milk.*

Similarly a little honest and healthy doubt may be had on a recent case of infection reported by Hüls ("Zur Frage der Uebertragung der Rindertuberkulose auf den Menschen," *Münch. Med. Woch.*, No. 24, June 17, 1902, pp. 1003, 1004). He reports the case of a wealthy miller's family composed of the wife, five sons and two daughters, Herculean in stature and boastful of strength and health. Consumption had never occurred in the family of either parent. Of the family all but two died from consumption within a few years, and even one of the

surviving sons was treated for a tuberculous abscess of the finger. The author states all were afflicted subsequently to the introduction by the miller of a herd of Simmerthal cattle on to his farm, which were nearly all infected with tuberculosis. It does not follow that the infliction of the family was caused by the milk of the cattle because the disease became fatal subsequent to the time when the cattle were bought. Hüls does not exclude other possible sources of infection before proceeding to prove infection from the milk. His statement is only supposition at best. Though the miller's family was "Herculean in stature" it cannot be that they used the milk of the whole of the Simmerthal herd. Can it be, then, that others were not infected by the same milk? This question is not answered. If this could be proven an argument of greater weight could be used against bovine tuberculosis in this case. There is a possibility amounting almost to a probability, that bovine tuberculosis is to be blamed in cases like this. But thus far, as in the case cited by Hüls, the statistics touching such cases in medical literature have hitherto been open to grave objection. The reports of cases in which it is urged that there has been a transmission of bovine tuberculosis to man have all indeed, of late, been very faulty. There is no doubt whatever, that bovine tuberculosis is open to the gravest suspicions as a source of infection for man. Nevertheless, we are never going to have statistics on this question which will be fit for anything but ridicule, unless we sharply distinguish between demonstrated fact and cheap opinion, between science and pseudo-science.

II. TRANSMISSION OF HUMAN TUBERCULOSIS TO CATTLE.

In the face of Koch's experiments and despite his statements, it is becoming more and more apparent that human tuberculosis is communicable to cattle. Experimental infection of animals with the disease is one thing: natural infection another. Nevertheless, a symposium of the earnest experimentation of scientists is worth the having, for by experiment most of our progress has been made. The possibility of transmission of human tuberculosis to cattle has been tried by

Nocard and Arloing among the French writers, Thomassen and De Jong among the Belgians, Orth, Stenström, Max Wolff, Johannes Fibiger, C. O. Jensen, Von Behring among the Germans, and De Schweinitz, Mohler and Ravenel in America.*

Nocard (*Presse Vét.*, Angers Vol. XXI., Nov. 30, 1901, pp. 398–403) states that from his experiments he believes cattle are not to human tuberculosis.

S. Arloing ("L'inoculabilité de la tuberculose humaine et des idées de M. Robert Koch sur cette tuberculose et la tuberculose animale" *Bull. Acad. de Méd.*, Paris, Vol. LXVI, No. 43, Dec. 24, 1901, pp. 897–911), reports experiments with three different cultures of human origin. One of these had been in the laboratory since 1896. . . . . Intravenous injection with an emulsion of this culture in a heifer calf, two sheep and a kid conveyed the disease, as the autopsy demonstrated tuberculous lesions in all these animals.

Thomassen ("The Receptivity of Bovine Animals for the Bacillus of Human Tuberculosis," Transactions of the British Congress on Tuberculosis, London, July 22–26, 1901, Vol. IV, pp. 21–27), reports an experiment in which a calf was inoculated in the anterior chamber of the eye with a pure culture of tubercle bacillus isolated from a case of tuberculous arthritis in man. When killed, after six weeks, both lungs were found to contain numerous miliary tubercles and some grey fibrous tubercles of larger size. The path of infection from the eye could be traced by the lymphatic glands.

De Jong ("Experiences comparatives sur l'áction pathogène pour les animaux, notamment pour ceux de l'éspèce bovine, de bacilles tuberculeux provant du bœuf et de l'homme"—abstract in *La Semaine Medicale*, 1903; also *Le Recueil de Méd. Vét.*, 1903), reports a series of inoculations in seven bovine animals, calves and steers; all became tuberculous by the injection of tubercle bacilli of human origin. In one the disease was extensive; in four others it had a retrogressive tendency; and in two it was progressive.

* Vid. Kober, *American Journal of Medical Sciences*, Oct., 1903.

J. Orth ("Ueber einige Zeit-streitfagen aus dem Gebiets der Tuberculose," *Berl. Klin. Woch.*, Aug. 25, 1902, pp. 793–978), showed by inoculation experiments on cattle that a progressive fatal tuberculosis was produced in the animals by material of human origin.

Olof Stenström ("Die Tuberculose des Menschen u. der Rinder, *Zeitschrift f. Thiermed.*, Band VI, VII, Heft IV, 1902, pp. 282–291), found from experiment that it was easy to infect cattle with tuberculosis of human origin.

Max Wolff ("Perlsucht und menschl. Tuberculose," *Deutsche Med. Woch.*, 28 Jahr., No. 32, Aug. 7, 1902, pp. 566–570), reports inoculation from cases of primary tuberculosis of the intestines in man, from which he concludes that pearl disease of cattle may appear in man.

Johannes Fibiger and C. O. Jensen ("Uebertragung der Tuberculose des Menschen auf das Rinder, *Berl. Klin. Woch.*, 39 Jahr., No. 38, Sept. 22, 1902, pp. 881-886), inoculated calves subcutaneously with tubercle bacilli of human origin and had important lesions in three. They consider that they have disproved the idea that tuberculosis of cattle is not virulent for man.

Von Behring, P. Romer and G. Ruppel (*Tuberculose*, XVIII, p. 90, Marburg, 1902). A cow was inoculated Nov. 26, 1901, with a tuberculous culture of human origin after a single passage through a guinea-pig, and on Jan. 14, 1900, the affected eye was enucleated and a pure culture was obtained from it after one passage through a guinea-pig. The cow at the close of the report was gradually losing ground.

De Schweinitz (see Salmon's Report to the Amer. Public Health Assoc. Meeting, 1903—not yet printed) has produced generalized tuberculosis in calves by inoculating them with cultures obtained from the mesenteric glands of children dead from tuberculous peritonitis.

Mohler (see same report of Salmon) has shown that as virulent tubercle bacilli of human origin can be obtained as that of bovine origin.

M. P. Ravenel (*Medicine*, Detroit, 1902, Vol. VIII, No. 7, pp. 529–546; Aug. No. 8, pp. 617–632), reports that he fed four calves with human sputum, and post-mortem examination showed that all had been affected with tuberculosis, the lesions in two being extensive. His inoculation experiments in calves and cows with cultures obtained from the mesenteric glands of a child which died of tuberculous meningitis proved very virulent for bovine animals.

These experiments and observations on the transmission of human tuberculosis to cattle represent the kind of work that is being done by those hard at research in these matters. There is a deep-rooted purpose among experimenters to discover the exact relation between the diseases. It may not be in our day, but some day we shall certainly know the exact relation between the diseases—and that beyond cavil or controversy. The question is one which strictly pertains to veterinary medicine; for it is a question of the relationship between animal disease and human disease. The solution, in any event, will revolutionize sanitary medicine in its application to the disease. The zest for discovery here, explains itself. The gratitude of his fellowmen and no conditional immortality is the reward for the discover.

Dr. W. P. Hill, 12th U. S. Cavalry, in a letter to the Review, dated Batangas, P. I., Dec. 26, says: "We have had no surra here for a year (Batangas Province), though it is still in Manila. The swamp-grass theory seems to be generally discredited here now, the fly being the only acknowledged transmitting agent."

Animals with Many Eyes.—Many animals possess more than two eyes which do not act together. A leech, for example, has ten eyes on the top of its head which do not work in concert, and a kind of marine worm has two eyes on the head and a row down each side of the body. Some lizards have an extra eye on the top of the head, which does not act with the other two. A bee or wasp has two large compound eyes which possibly help each other, and are used for near vision, and also three little simple eyes on the top of the head, which are employed for seeing things a long way off.

THE ORIGIN OF PULMONARY TUBERCULOSIS, AND THE PREVENTION OF TUBERCULOSIS.

EXTRACT FROM A LECTURE, BY PROF. E. V. BEHRING, DELIVERED BEFORE THE GERMAN SOCIETY OF NATURAL HISTORIANS.

TRANSLATED BY A. EICHHORN, D. V. S., BUREAU OF ANIMAL INDUSTRY, MILWAUKEE, WIS.

Behring speaks of his conviction that human pulmonary tuberculosis originates from tubercle bacilli passing through the intestinal mucous membrane into the system in the earliest childhood. The latest experiences indicate that there is hardly a person who escapes through life an infection of tuberculosis.

Naegeti in Zurich, to convince himself of this standpoint, made careful autopsies on very numerous bodies, and found, that in all people, dying after the age of 30, traces of a previous tubercular infection were present. In the ages between 18 to 30, 96 per cent.; from 14 to 18, 50 per cent.; from 5 to 14, 33 per cent.; from 1 to 5, 17 per cent., showed tubercular changes, while the children below one year were free of the disease. Franz tested with tuberculin the men of the 1st Bosnish Herzegovina regiment, and also those of the 60th Hungarian infantry regiment, and found that of those in their first year's service 61 per cent., and of those in their second year's service 68 per cent. reacted, despite the fact that the quantity of tuberculin injected was 1 to 3 milligrammes and only in exceptional cases 5 milligrammes (had there been used one centigramme in all probabilities the percentage would have been considerably higher). Berend in Budapest on the other hand, could not obtain a reaction in 96 young children by increasing the dose to 1 centigramme.

With such a distribution of tuberculosis, it is impossible to think of an isolation of all infected people, and this could only be considered with those affected with coughing pulmonary tuberculosis. A tubercular infection, on the other hand, does not mean a tubercular lung affection; on the contrary, the great frequency of the former, compared to the latter, indicates a fre-

quent natural recovery from local tuberculosis. Up till now there is no positive evidence by which it could be established, that grown-up people could infect themselves with tuberculosis by simple inhalation. Heredity is also, from a practical standpoint, of little importance, not even regarding the hereditary predisposition.

Outside of infections from the uterus, the following rule can be laid down: *The chief source of tuberculosis is the milk taken by the nursing child.* This harmonizes with the fact, that in the baby when nursed, and also in the sucking animal, the intestinal mucous membrane is practically in condition for infection. In young animals, genuine proteids of large molecules (as well as the diphtheria and tetanus serum), are passing unchanged through the intestinal mucous membrane, in the same manner as if they had been injected into the blood current, while in older animals, they have to be converted into peptones before absorption can take place (Roemer). These facilitated absorptions are due to the fact that the intestinal mucous membrane in the young is not quite covered with a uniting epithelial layer, and also that the secretion of ferments from the glands is imperfect. Anthrax bacilli, administered in milk to guinea-pigs, before they are eight days old, will pass through their intestines into the blood without any interference, while the intestines of older animals expel them in a short time. By feeding a few tubercle bacilli to guinea-pigs, only a few days old, they will soon develop lesions of the infection in the mesentery, and also on the peritoneum, near the cæcum, numerous submiliary tubercles will appear. Later on, the glands of the head and neck will become infected, and finally pulmonary tuberculosis will develop, which till now was thought to be due to inhalation.

From these experiments one can conclude that pulmonary tuberculosis in men and animals is due to an intestinal infection in the very young. An infection originating as described can remain latent in the system, through many years, until sooner or later, under the various favorable conditions, will begin to

develop, and in many instances eventually cause pulmonary tuberculosis. In infected families, there are ample opportunities for infecting the babies' digestive tract with the coughed up and expectorated material. The susceptibility for the infection is always increased in the young as well as older, in such general and intestinal diseases in which the epithelia of the intestinal mucous membrane is diseased or injured. In connection with this, in guarding against tuberculosis, one must aim first of all to give milk to children free from tubercle bacilli, and also that later in life through a properly regulated mode of life, a disturbance of the intestines should be guarded against.

Tuberculosis, among cattle, which in principle is identical to human tuberculosis, is also very extensively spread, which is proved by the properly applied and reliable tuberculin test. The infection in cattle also occurs in the very young, while the spontaneous recoveries are here also very frequent. Cattle tuberculosis is kept out of many herds by the successful application of Bang's method, while during the last few years, Behring's immunizing inoculations are extensively applied, of which the results will soon be published, from which conclusions can be drawn as to its value.

The experiments just carried on also authorize the conclusion that the milk of highly immunized cows contains immunizing material, *by which in all probability the milk of such cows will be used for immunization of children.* B. has no doubt that with the introduction of relatively harmless tubercular virus into the human system, the same way as in cattle, an isopathic immunity can be produced. But for this purpose it will be necessary to produce, by a proper method, an attenuated virus. On the other hand, the introduction of living virus into the blood of human beings is always considered serious, and one must think whether immunity could not be produced through feeding of a proper virus. Outside of this, it may also be possible to introduce the living virus, together with the milk containing the protective substances, which in some other infectious diseases proved very beneficial.

Regarding the question as to the identity of human and bovine tuberculosis, B. states that he considers the producers of the two diseases as the same, in such comprehension that they are of the same species, but regarding their virulence of a different variety. This is explained by the fact that cattle can be immunized with human tubercle bacilli. The statement of R. Koch, that bovine tuberculosis is of no danger to the human beings, was proved to the contrary from many sides. The milk from the affected animals, also the butter derived from their milk, cannot be considered as very dangerous, as it is chiefly consumed by adults; on the other hand, one cannot emphasize enough the danger to children from taking milk containing tubercle bacilli, no matter whether derived from cows or human beings.

CANNOT PRACTICE CHRISTIAN SCIENCE ON ANIMALS.—The Texas District Court at McKinney has decided against Christian Science as the proper treatment for animals. The case came from the County Court in a suit brought by a farmer of Collins County against the Houston and Texas Central Railroad for so injuring his horses with a train that they died. The testimony was straight, and it seemed that the plaintiff would win his contention without a doubt. He went on the stand in his own behalf, and what he said in answer to questions strengthened his case until the attorney for the railroad asked him what treatment he had given the horses. He answered that he had given them the Christian Science treatment only. He had prayed for them, but had put nothing on their wounds and had done nothing to relieve them. The jury returned a verdict for the railroad company.—*Exchange.*

THE value of cattle imported into the United States during the calendar year 1903 was $644,769, of horses $1,472,420, of sheep $853,413, and of all other animals $714,487, making a total value of all animals imported of $3,685,089.

THE value of all animals exported from this country during the year 1903 was $42,551,174. This includes cattle to the value of $37,725,452, hogs to the value of $53,180, horses to the value of $3,142,731, mules to the value of $354,776, sheep to the value of $1,153,770, and all other, including fowls, to the value of $121,265.

OXYGEN TREATMENT IN PARTURIENT APOPLEXY.

By Frederick R. Whipple, M. D. V., Kewanee, Ills.

I have used the Schmidt or potassium iodide treatment in the above-named disease nearly two years, most always with good success, as far as relieving the original trouble; but so often complications would arise, caused by injecting the irritating iodide into such a delicate organ as the udder, causing quite often a purulent inflammation, and occasionally followed by the death of the patient; then, again, the secretion of milk would so often be diminished that it would not pay the owner to milk the cow, and, in 50 per cent. of my cases the secretion of milk would fall short from one to two quarts per day. The above and several other complications led me to order an oxygen tank complete, with inhaler and milk tube, the results of which I am more than pleased with. I have so far treated about fifteen cases, and never have had a complication to follow from the effect of the oxygen. Then the oxygen treatment is so simple. With the Schmidt treatment, after making a diagnosis of parturient paresis, the first thing was to call for a quart of boiling water, then wait until the kitchen fire was built and water heated and cooled, which would often take an hour (valuable time lost if the veterinarian is in a hurry to make another call, or behind ten or twelve hours with rest). But with the oxygen treatment it is altogether different; one can complete the treatment in fifteen minutes.

I first remove all milk, wash udder in strong solution of zenoleum, afterwards in a solution of bichlorid mercury (1–500), dip tube in same solution and insert milk tube connected with rubber tubing to oxygen tank, turn on the oxygen and inflate the udder with the gas until tense. If the cow is not up in eight to twelve hours I repeat the oxygen. The only other treatment I give is warm injections per rectum every three to four hours, and draw urine. It is only in three or four cases have I found three injections of oxygen needed. I look for my patient to be up in a few hours after the second injection.

Case No. 9.—Jersey, second calf; she was fed bran-mash during the day; next morning she appeared weak to owner, and by noon was down. I was called and diagnosed parturient paresis; administered the oxygen treatment; returned at 8 P. M., found cow much brighter; bowels and kidneys active; repeated oxygen, and next morning cow was up, well as ever.

Case No. 10.—Grade shorthorn; six years; had given birth to twin calves; retained afterbirth, which I was called to remove on second day. Next morning owner found her down with symptoms of milk fever. I was called and arrived about 9 A. M. Gave oxygen; called again at 8 P. M.; could see no change in her condition; repeated oxygen. Also again at 8 A. M.; she appeared now much better, and drank pail of water; had movement of bowels during the night; about the middle of afternoon she got on her feet. I called during the evening and gave one pound of magnesium sulphate, and two ounces of oil of terebinth, and left a few doses of strychnina. In a few days she was returned to the herd.

Case No. 11.—Grade Jersey, four years; gave birth to extra large calf; owner assisted her in labor; was down five hours after delivery of calf; was treated by self-styled "cow doctor" until next day, when I was called. Gave oxygen treatment and repeated next day. In three hours after second injection cow was up and eating.

Case No. 12.—Jersey, kept in city; has stood in barn all winter; only exercise was in lot about twelve feet square; fed on bran, oats and clover hay. Four days after birth of calf owner found her down, but able to rise. I was called and gave injection of oxygen. After about four hours she appeared well; except not eating; gave one pound of magnesium sulphate in drench. Next morning she was ready for her feed.

Now, I do not wish to try and discourage those using the potassium iodide treatment, but will advise those that are not satisfied with it to try the oxygen, and report their experience with it.

NERVOUS GOATS OF TENNESSEE.

By Mark White, Jr., Class '04, University of Pennsylvania,
Jan., 1904.

Paper read before the Veterinary Medical Society of the University of Pennsylvania.

There is nothing to be found in veterinary literature or elsewhere on this particular breed of goats, therefore, I feel I am giving to our profession some fresh material to put in their note books. I think also that it would be worth your while if ever in Tennessee to make it a point to see a flock of these remarkable goats, in order to wholly appreciate this strange phenomenon. These goats also go by the name of "stiff-legged" or "fainting" goats by the people in the neighborhood where they are found, being viewed with considerable interest as well as curiosity.

The true history of this goat is not at my command, but to the best of my knowledge they originated in the counties of Giles and Marshall in the State of Tennessee, and have never been seen out of that State nor have they been seen in any other part of the world, a point which should be of much interest to our profession. In appearance they are like any other goat, there being all the colors common to goats represented among them, and weighing from sixty to eighty pounds when full grown. You could not distinguish them from the common goat only by the peculiarities which I am now ready to state.

The chief and interesting characteristics of these goats above all consist in the fact that they fall to the ground with their entire body (legs, neck and lumbar muscles), becoming perfectly rigid or stiff, showing a typical picture of an animal suffering from strychnine poisoning. These "fainting" spells last for about ten or fifteen seconds, after which time the animal arises and walks off, showing slight stiffness in the posterior limbs, for a distance of fifty or sixty feet, after which time he walks and acts just like any other goat. These "fainting" spells can be produced or brought on by any sudden excitement which will startle them in the least, or in case the goat attempts to jump a bar or rail not higher than twelve inches, from the ground, or

say he attempts to jump a two feet ditch or stream, he at once falls to the ground in a "faint." This strange phenomenon is seen in all the off-spring without exception, being often noticed in kids, but as a rule not well marked until one year of age. This is an exceedingly interesting point to veterinarians, for it shows that it is not pathological in origin, but an hereditary con-

dition. There are about 100 head of these goats in existence, all of which tread Tennessee soil. These goats are unfortunately deprived of the much-enjoyed sport of jumping fences and walking barn roofs, so much enjoyed by other goats, for they will remain in an enclosure with any kind of an old fence. As George C. Brown, of Spring Hill, Tennessee, says, this may sound "fishy," but you must see these goats in order to appreciate them.

AT a recent meeting of the Missouri Valley Veterinary Association, held in Kansas City, $20 of the Association's funds was voted to the Nocard Monument fund, and the Secretary requested to send check to Dr. A. Liautard, of Paris, to be turned over to the committee.

A PRELIMINARY REPORT OF THE TREATMENT OF CHRONIC LAMINITIS IN ITS EARLY STAGES.

By W. P. Hill, Vet. 12th U. S. Cavalry, Batangas, P. I.

In the treatment of the subsequent stiffness following acute laminitis I have for eight years been using blisters round the coronet, bar or rocker shoes, exercise, etc., but have very seldom seen any good results; in fact, generally very discouraging. After treating a patient through the acute course of the disease, he comes out walking on his heels and with hunched-up body, how helpless we feel, having done everything we can and with nothing further to do but to repeat the blister, which does no good at this time. No particular signs in the alteration of the foot's shape have taken place, and if anything is to be done it must be now or never. Thoroughly tired of my poor success with the old routine treatment, I determined to try what effect hypodermic injections of spirits terebinthinæ over the coronet would have. When I arrived here with my regiment the horses turned over to E Troop had three that had been suffering with laminitis for ten days; they had been in hot soak tubs and given nitrate of potassium and aconite, and exercised daily; the lameness was still excessive; they laid down most of the time, and were covered with bed sores. I had the feet well washed with soap and hot water, then washed off with a strong solution of creolin, sterilized the syringe and needle and drew up one-half a drachm of spirits terebinthinæ. Then strapping up the foot to be injected, I put the needle under the skin about an inch above the coronary band, attached the syringe, and injected the medicine. This I did to the front feet of the other two; had them tied up short to the picket line. I chose this place to keep them from bruising their ankles when pawing. They were very restless for three or four hours, but after this time all uneasiness had passed off. The next day there was considerable swelling round the coronets, a slight rise in temperature and soreness on pressure; this passed off on the third day; from this time I noticed a change for the better, they stood up most of

the time and in a natural position. One of the horses a few days later developed an abscess at the point of injection, which I opened and syringed out, healing taking place in a short while. Three weeks after the day of injection these horses were sent to Manila, a distance of 90 miles, the man who took them down assuring me they went well all the way and showed no stiffness. Before they started I had them trotted up and down and I was surprised at their recovery. I don't mean to infer they were as sound as ever, but a wonderful improvement was manifest, with good prospects of entire recovery. These horses I intend to see when I go down to Manila, and will write further as to their final condition.

These results so encouraged me that I have used it once again. This horse had a severe laminitis. I used the routine treatment in the acute stages, but he was left with the same characteristic walk after the tenth day, when I used the hypodermic ; in five days he was greatly improved ; altogether he was on sick report one month. He is now ready for duty, and is going as sound as ever ; of course he might have come out as well with blistering, but, judging from my previous experiences, I have very strong doubts, and cannot help crediting it to the injection.

This is all preliminary, but so far the results seem very promising, and I intend to follow it up with all future cases. Any improvement on the blister, I think, is an advance in the right direction. I don't know if this has been tried before ; if so, I would like to hear from others regarding their success.

Courage of a Horse.—Horses painfully contend on the race track for victory out of their own native courage and ambition—not under punishment, for, as a rule, the courageous horse will "stop" or "shut up," as the technical phrase is, when whipped or spurred at the finish of a race. In California some years ago a running horse broke one of the bones in a foreleg near the close of a heat, perhaps seventy yards from the wire. He faltered for a moment and then, recovering himself by a mighty effort, struggled on and won the heat practically on three legs.—(*Country Life in America.*)

STUDIES UPON LEUCOCYTOSIS.*

NOTE BY DRS. H. STASSANO AND F. BILLON.

The product mentioned in the preceding article (See REVIEW for November, 1903) as having been used by us in the experiment described to induce an increase in the number of leucocytes was one which has been introduced into veterinary therapeutics by Doctors Pichard and Cotty. It is obtained by the action of ozone upon a terpene-bearing volatile oil, the action being arrested at a point when the latter has absorbed a quantity corresponding to four volumes of ozone. This product was kindly furnished us by Messrs, Brigonnet Pére & Fils & Gaubert, who manufacture it for commercial use at La Plaine St. Denis, under the name of "Tallianine."

The product is entirely harmless. We have injected it intravenously in massive doses without noticing the least subsequent disturbance. *Its most marked characteristic, physiologically—the one which in all probability will account, at least in part, for its curative properties—is to rapidly increase the number of leucocytes in the circulating blood.* In the rabbit, it causes in a short time an intense, but fleeting leucocytosis. The following observation copied from our records seems to us to be a very typical example of this form of leucocytosis in small animals.

January 18th, 1902.—Rabbit, weighing two kilogrammes, given 2 cubic centimetres of "Tallianine" in the vein of the ear.

Time of Examination.	Number of Leucocytes in the Cubic Millimetre of Blood.
Before the injection	13,500
20 minutes after	9,750
40 " "	45,750
1 hour after	37,500
1 hour and 20 minutes after.	38,750
2 hours and 20 minutes after	20,000
2 " " 40 " "	12,250
3 " after.	11,250

* NOTE.—This is the second part of an article prepared by Drs. Stassano and Billon entitled "The Fibrin-Ferment content of the Blood is Proportional to its Richness in Leucocytes," and originally appeared in our issue of November, 1903. As several of the tables were misplaced by the printers and the article thus became confusing and misleading, it is reprinted correctly in this issue.

In large animals the product induces the leucocytic action more slowly. The following observation is an example:

March 31st, 1902.—Ten cubic centimetres of "Tallianine" were injected into the jugular of an old horse.

Time of Examination.	Number of Leucocytes per Cubic Millimetre.
Before injection	5,250
15 minutes after	6,500
45 " "	7,250
1 hour and 40 minutes after.	8,000
2 hours " 10 " "	9,500
5 " " 30 " "	5,000

The following observation, the subject of experiment in this case being a heifer, is a much better demonstration of the degree of leucocytosis induced in large animals by the product with which this communication is concerned, viz., "Tallianine."

November 16th, 1902.—The animal, weighing over 600 pounds, received by the jugular vein 300 cubic centimetres of "Tallianine," the injection being made in eight minutes.

Time of Examination.	Number of Leucocytes per Cubic Millimetre.
Before the injection	12,750
5 minutes after	9,000
30 " "	12,250
1 hour after.	14,500
1 hour and 30 minutes after	14,000
2 hours after	20,250
2 hours and 30 minutes after	18,750
3 " " 30 " "	17,500
4 " " 30 " "	18,500
5 " " 30 " "	21,750
6 " " 30 " "	19,250
7 " " 30 " "	19,000
10 " after	24,500
11 " "	25,000
12 " "	23,000
13 " "	18,750
30 " "	14,250
52 " "	12,500

There exists a certain ratio between the amount of the product injected and the degree of the hyperleucocytosis induced.

The proof thereof will be seen if one compares the results of the preceding observation with those of the following double observation. We possess, besides, in our books of records, other observations which prove the existence of this ratio as a fact.

December 17th, 1902.—Two cows, one, weighing about 1200 pounds, received by intravenous injections 50 cubic centimetres of "Tallianine"; the other, weighing about 1150 pounds, received 20 cubic centimetres "Tallianine."

Time of Examination	Number of Leucocytes per Cubic Millimetre.	
	1st Cow 50 c. cs. "Tallianine."	2d Cow 20 c. cs. "Tallianine."
Before the injection, and a bleeding of 200 cubic centimetres in each cow	8,750	4,250
Five minutes after the bleeding.	12,500	6,750
Injections of "Tallianine" given:		
2 hours after the injection . . .	10,000	5,000
4 " " " " . . .	12,250	5,500
6 " " " " . . .	13,500	5,500
7 " " " " . . .	21,500	9,250
9 " " " " . . .	8,250	6,750

The hyperleucocytosis, of which the above are a few examples, concerns, both in small and large animals, the polynuclears. In the majority of cases the increase reaches as high as the third of the normal ratio between these leucocytes (the polynuclears) and the mononuclears.

WONDERFUL HORSES AND HORSEMANSHIP.—Daring German horsemen have outdone the bicyclists at their own game. In several parts of the Fatherland men and horses have been giving exhibitions of skilful riding and running on a small saucer cycle track, similar to the "whirl" used by vaudeville performers in this country. The tracks are built specially to withstand the great weight of the galloping animal that spins round and round until the spectators become dizzy. Several horses have been broken to the feat and seem to take great delight in going at top speed around the steep bank. The riders invariably ride standing.

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

VERMINOUS BRONCHO-PNEUMONIA IN THE ASS.

By S. STEWART, M. D., D. V. M., Kansas City, Mo.

During the latter part of February, Mr. Philip Walker, of South Moline, Kansas, who raises a large number of jacks, and who also buys and sells over a wide area of country, observed that some of his animals were sick, the principal symptoms of

Fig. I. Adults about natural size. a—Male. b—Female.

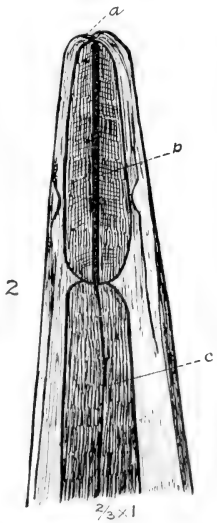

Fig. II. Head parts of adult. a—Mouth. b—Oesophagus. c—Intestines.

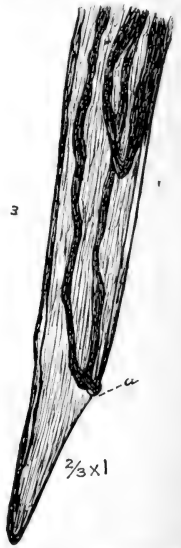

Fig. III. Caudal extremity of female a—Anus.

which were cough, nasal discharge, rapid emaciation and death. He sought the advice of veterinarians, and the disease remained a mystery until about the 1st of April, at which time some

seven were dead. About March 16th, Dr. D. E. Sawyer, of Howard, Kansas, was called in to investigate the difficulty, and

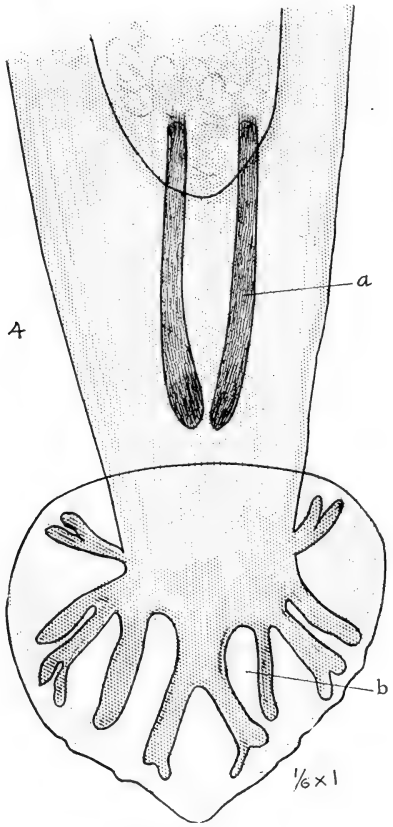

Fig. IV. Caudal extremity, male.
a—Spicules.
b—Caudal pouch, showing special arrangement of ribs.

at first thought them to be simple cases of broncho-pneumonia. The disease continued to spread, however, and Dr. F. F. Brown, of Kansas City, was called in consultation. It was found that

Mr. Walker had on the one ranch 75 head of jacks and jinnies, which were divided into three groups, a part of which were stabled all the time, a second group were stabled nights, and the third group not stabled at all. The disease appeared in all three groups. As each group secured its water supply from a different source, it was evident that the disease was not spread through the water. The provender came from a common source for the three groups. During this investigation it was not determined from what source the infection reached this herd. The disease developed in animals of all ages, but it was more violent and fatal in those under a year old. In the beginning the disease was observed as a dry suppressed cough with some loss of appetite and lack of vigor, which condition rapidly increased. With the cough there was soon present a mucopurulent expectorate, the animals grew rapidly worse, and those which succumbed, died in 7 or 8 days. Some of the stronger and older animals seemed to be able to withstand the attack, and under treatment recovered. The loss was 13 animals in all, including one jack 7 or 8 years old, one 4 year old, and two yearlings, the remainder were sucklings of both sexes. After the disease was recognized and treatment instituted, only two of the considerable number which were sick, succumbed to the disease. The sick animals which had survived to the time of the investigation, were medicated by inhalation of oil of turpentine and oil of eucalyptus, 1 drachm each twice daily, and internal administration of powdered digitalis, powdered nux vomica, and powdered chloride of ammonium, doses suitable to the age of the animal.

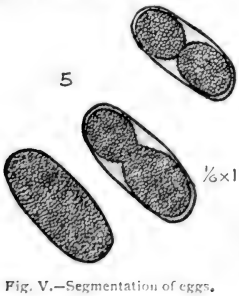

Fig. V.—Segmentation of eggs.

Post-mortem examination revealed catarrhal bronchitis with small pneumonic centres throughout the lungs, and the presence of adult strongyli in the mucus which occupied the larger bronchi. No distinctive post-mortem changes to be found in other organs of the body. The worms were submitted for special study to Prof. B. F. Kaupp, Kansas City, who unhesitatingly classified them as *Strongylus Arnfeldi*. The professor made a number of drawings, which are herewith reproduced, showing the essential evidences for making diagnosis of the worms.

Numerous cases of verminous bronchitis are found throughout this section of the country in cattle, swine, and sheep, but this is the first out-break of this disease in solipeds which has been brought to our notice. If any of the readers of this article should know of other out-breaks they would do us a favor by writing a description of the same and sending it for publication.

For full description of the *Strongylus Arnfeldi* see Neumann's "Parasites and Parasitic Diseases of Domestic Animals," pages 582 and 595.

PUNCTURING PER RECTUM.

By Z. W. SEIBERT, V. S., Cresline, Ohio.

This may be new to some of the profession, and possibly old to others, but, as these two cases are very interesting to me, I will give it to our worthy REVIEW for publication and the benefit of those whom it may concern.

Case No. 1.—I was called to see a black horse, 1000 lbs., Nov. 10. Found my patient suffering intensely with pain and on inquiry found that he had been in the same condition for some hours, and had been treated with all manner of stuff too numerous to mention. The horse on my arrival was pawing, lying down and sitting up repeatedly; turning up lips quite often. Circulation good and full; temperature 101° F., respirations somewhat hurried; eyes staring. When down and lying quiet for a minute he would extend his head and neck as far as he could. I gave my ordinary colic remedy, but with no relief. Repeated in one hour and no relief. I could hear no vermicular motion of the bowels at all. Abdomen seemed full, as if full of gas; punctured and found no gas, but in two hours the rectum seemed to bulge out. Here is where I made my examination per rectum, and to my surprise I thought I could discover gas. I never did this for gas, but was worn out, being up all night the night before. I concluded to try what I could to relieve the horse, so that I could go home, I washed my arm and used a small trocar that usually is with a hypodermic syringe. I tied a string to the needle and went into the rectum as far as my arm would allow, where I found what I thought was gas. I worked the trocar slowly till I thought I had it where I wanted it; pulling on the string I pulled the needle out of the canula, leaving same in and holding canula with thumb and finger, and to my surprise I found an enormous amount of gas. The horse became quiet. I left some tonics and told the owner I would be back next morning.

Next morning when I returned the owner said he had been quiet all night, but when I was there he seemed to have a very little pain every half hour, but bowels did not move, no peristaltic movement that I could detect. Gave aloes, ℥ vii; calomel, ℥ ss; fl. ex. nux, ℥ i; made into pill. But pill did not work in twenty-four hours and was called again. Next morning, Nov. 12, I found horse very dull and had eaten nothing. I gave him one grain of strychnine hypodermically and kept strychnine, gr. ss, up every six hours. After the fourth dose of strychnine the horse began to eat and drink, bowels began to move, and he made a good recovery.

Case No. 2.—On Dec. 2, 1903, a black mare, 14 years old, took sick while in town and was brought to my barn for treatment. She could hardly stand till we got the harness off. Circulation full and strong. Temperature 102° F.; would paw, lay down and roll, look around at side; no peristalsis, some eructation of gas, flanks seemed full, eyes staring. Gave her ammonii carb., ℥ ii; tr. asafœtida, ℥ ii; spirits nitre, q. s. ℥ i. Given in capsule. No relief, and repeated in one-half hour and no relief. Then I gave soda bicarb., ℥ iii; aqua, Oi, with no relief. Gave turpentine, ℥ ii, in capsule. No relief. I knew I had gas to contend with and tapped her, but got no gas. So I made examination per rectum and discovered gas. I used small trocar as in Case No. 1, and I found an enormous amount of gas. The puncture gave *instant* relief.

Brothers in the profession: When you get a case where you can give no relief and think you have gas, don't forget the rectal examination, and in many cases you will be rewarded for your trouble.

I would like to say right here that I found one of those so-called cases of colic, that when I made a rectal examination, I found a rectal abscess, from which I drew five quarts of pus, and washed it out every day and dressed with H_2O_2, and the horse made a good and speedy recovery. Do not neglect the rectum because it is a little trouble to you; examine it in these doubtful cases and you may be rewarded well for your trouble, for you know the rectum is the seat of a great many troubles.

FUNGOSIS TOXICUM PARALYTICUS.*

By S. H. SWAIN, Decatur, Ill.

It will be remembered that at our meeting in January, 1903,

* Presented to the Meeting of the Illinois Vet. Med. and Surg. Assn., Aug. 18, 1903.

my son, Dr. W. A. Swain, of Mt. Pulaski, Ill., reported a case of food poisoning in a German coach stallion, which was successfully treated by him and myself by the intravenous injection of stronger water of ammonia (aqua ammoniæ fortius). The result of this treatment was so marked and satisfactory, and being new in the treatment of this fatal disease, that I felt a desire to give the intravenous injection of aqua ammoniæ fortior a further trial in the treatment of this rapidly fatal and, to me, very unsatisfactory disease to treat.

My desire was gratified on January 17th, 1903, as on this date I received a call by Mr. L. W. Benson, of Harristown, Ill., requesting my services to a supposed case of azoturia, but on arriving at the farm at 2.30 P. M., I found the case to be instead of azoturia what seemed to be a hopeless case of food poisoning. The animal, a large road horse, had been running in a cornstalk field for some three weeks prior to the attack, and on my arrival was found in a recumbent position, and on being assisted to his feet was unable to stand even when supported. At this time (about 3 P. M.), respiration eight, circulation almost imperceptible, temperature 98½; at 3.30 P. M., temperature was again taken and was now down to $97\frac{6}{10}$. At this time I administered a physic, followed by intravenous injection into the median subcutaneous vein of four drachms of aqua ammoniæ, diluted with an equal quantity of distilled water, and immediately following the administration of the above ½ grain of strychnia sulphate and 30 minims of fluid extract of digitalis were administered by hypodermic injection. The response to this treatment was remarkably satisfactory. Within a very short time the respiration became more frequent, the circulation was increased in force and rapidity. At 4 P. M., within thirty minutes after the administration of the ammoniæ, thethe rmometer registered his temperature at $98\frac{4}{10}$. The patient was yet in the recumbent position, but showing rapid improvement. At 5 P. M. his temperature was again taken and found to be 100. A repeat dose of 2 drachms of the ammonia was again administered as before and also a repeat dose of ½ grain of strychniæ sulphate with 2 grains of convallaria. Shortly after the administration of this dose at 5 P. M., to the great surprise of all present, the patient rose to his feet at a first effort and without assistance and remained standing. At 6.30 P. M. the patient was on his feet, but somewhat restless; respiration quite rapid, circulation stronger and more frequent; temperature was now found to be $101\frac{7}{10}$. The condition of the patient was so satis-

factory at this time that treatment for the night was now discontinued. The patient was watched until 9 P. M., and at this time was resting quietly on his feet, and was then left for the night in care of his owner.

A second visit was made the following day, January 18th. I reached the patient at 11.25 A. M., and found him still on his feet, and he seemed to be doing fairly well. I learned from the owner that he had rested quietly on his feet during the night, and had turned around in the stall several times during my absence. Respiration was now 10, circulation about 40, temperature $102\frac{3}{10}$. A repeat dose of $\frac{1}{2}$ grain of strychniæ, 2 grains of convallaria, with 20 minims of digitalis, was administered by hypodermic injection. The patient was yet showing some lack of coördination in the posterior extremities. The owner was now advised of the importance of careful treatment, and that this partial paralysis was liable to become permanent, but he seemed over-confident of the complete recovery of the patient, and declined to incur the expense necessary for further personal attention by me. I then left the following preparation: Tr. nux vomica, 2 ounces; tr. gentian, 2 ounces; hydrochloric acid dilute, 1 ounce; water, q.s. fiat eight ounces, mixed and given one ounce morning and evening in food, or water drench. When this had been administered and a report made to me of his condition, the following was prescribed: Nux vomica tincture, 4 ounces; gentian tincture, 4 ounces; iodide of potassium, 4 ounces. Mix. Aqua, q.s. fiat sixteen ounces. To be given morning and evening, one ounce at a dose, in food or water drench.

I might suggest here that when administering ammoniæ as above, the seat of puncture should be thoroughly washed shortly after each injection with vinegar, in order to prevent the irritation resulting from the ammoniæ.

I must say that it is a source of much regret to me that I was not permitted to give this case the necessary personal attention for his complete recovery, but such is the fate of the veterinarian, and would say I have never seen the patient since my visit on January 18th, but have learned through his owner that his action in his posterior extremities is somewhat deficient, but is so far recovered as to be able to do good service on the farm.

I hope this treatment will be given a thorough trial by members of this Society, and that their success or failure may be reported to us.

COMPLETE RUPTURE OF ABDOMINAL MUSCLES.*

By JAMES HARRISON, V. S., Maple Rapids, Mich.

On August 23d last a Mr. Wellington Irwin came to my office and informed me that he had a mare heavy in foal and past due, and that she had broken down, and wanted me to go to his farm and see if I could do anything for her. I had seen several years ago a similar case, and advised him that I thought the case was hopeless, and the best thing he could do was to go home and put the mare *hors-de-combat*. But he was anxious for me to go and see the mare, and was willing to pay the price; so I went to his farm. The mare was out in the pasture-field on the flats. We found her grazing, and on examination found her pulse normal, respirations normal, and temperature 101° F. Muscles of the abdomen ruptured completely, allowing the abdomen to sag a great deal; drawing the mammary glands down very much; after examination he asked me what I thought of the case. I told him I thought the best way out of the difficulty was to shoot her at once. While we were talking a cattle drover came along and expressed the opinion that I was giving him good advice. But the mare was not suffering any, and he seemed to think that if we could get the colt away she might possibly raise the colt and perhaps do some work afterwards, stating that he had seen one in a similar condition, and that she had done considerable work on the farm. Then, to satisfy him, I took the colt from her, at the same time telling him that I did not think it would live or that the mare would ever live to raise it. The colt was strong and healthy and fully developed, and after a short time got on its feet and nursed. I was very busy at the time and did not go to see them any more. I think it was three or four days afterwards the owner came to town and told me the colt had died after two days, but the mare was still picking around the field. It was about a week afterwards, he told me he found the mare dead in the field one morning.

This is the second case of this kind I have seen. The first one was an aged gray mare due to foal, but in which the rupture seemed much more extensive, the belly dropping to a line much below the hocks and knees. She was taken out and destroyed.

I unfortunately did not have a chance to make a post-mortem of Mr. Irwin's case, but he informed me that he had opened her

* Presented at the meeting of the Michigan State Veterinary Medical Association at Lansing, Feb. 2, 1904.

and found that the muscles were torn (to express his own language) in a "jaggered way, saw-like shape," on one side of the centre or linea alba.

Now, the question is with me: What could I have done in a professional way, if anything?

OVER SEVENTY-FIVE VETERINARIANS were in attendance at the recent meeting of the Missouri Valley Veterinary Association, held in Kansas City, Feb. 15. Twenty-six new members were added to the list.

ON Feb. 23 Dr. William Herbert Lowe was reëlected to the office of City Veterinarian of Paterson, N. J., for a term of three years, and Dr. T. Earle Budd has been elected City Veterinarian of Orange, N. J. It is becoming the custom to appoint city veterinarians in many of the Eastern States.

NUMBER AND VALUE OF FARM ANIMALS.—The Acting Statistician of the Department of Agriculture has completed his estimate of the number and value of farm animals in the United States on January 1, 1904, by separate States. The totals for the country are shown in the following table:

Farm animals.	Number.	Average price perhead.	Value.
Horses	16,736,059	$67.93	$1,136,940,298
Mules	2,757,916	78.88	217,532,832
Milch cows	17,419,817	29.21	508,841,489
Other cattle	43,629,498	16.32	712,178,134
Sheep	51,630,144	2.59	133,530,099
Swine	47,009,367	6.15	289,224,627

CHRISTMAS GRADUATES OF THE ONTARIO VETERINARY COLLEGE.—At the examination held by the Board of Examiners on Dec. 22, the following received diplomas: Charles W Bandy, Litchfield, Ill.; C. F. William Bauer, St. Louis, Mo.; Anson W. Beach, Iroquois, Ont.; Henry N. Berthiaume, Woonsocket, R. I.; William J. Boddy, Walkerton, Ont.; Thomas E. Bowes, Castlederg, Ont.; George Bulgin, Elmira, Ont.; William S. King, Katonah, N. Y.; Jas. McDermid, Harriston, Ont.; William H. Mahoney, Rochester, N. Y.; James Henry Mann, Grand Valley, Ont.; P. Ernest Pallister, Ottawa, Ont.; Thomas A. Parker, Lynn, Mass.; Daniel J. Seifert, Linwood, Ont.; John E. Taylor, Toronto, Ont.

EXTRACTS FROM EXCHANGES.

GERMAN REVIEW.

By ADOLPH EICHHORN, D. V. S., Bureau of Animal Industry, Milwaukee, Wis.

TETANUS IN A DOG [*Grunau*].—Considering the rare occurrence of tetanus in dogs, the following case is of interest for publication: The tail of a nine-months-old English hunting dog was amputated by simply chopping off the end of the same; the hæmorrhage following the operation was controlled by a tight ligature, which was applied about 4 cm. from the end. As the dog showed poor health and impaired appetite for about eight days following the operation, the author was called to treat the animal. On examination he found the dog very fearful, highly irritable, and stiff behind. The ligature applied at the time of the operation was still there, and was found grown in, cutting through the skin and tissues. The ligated portion was gangrenous, and covered with fœtid scabs. The treatment consisted of a scientific amputation of the tail about 2 cm. above the ligature, and the application of antiseptic dressings. The animal was extremely excited during the operation, also the stiffness of the hind part was noticeable. On the following day, the dog could not bend the hind legs, and without assistance could not rise from the ground. Assisted up, the patient stood with the hind legs far extended and stretched back. The stump of the tail was held up to the right, but when the dog was petted by its owner, it was easily moved. The front extremities at this time were movable by the animal, while on close observation they appeared in a peculiar abnormal position. The appetite was fair, the act of mastication and deglutition was not interfered with; intestinal movements and defecation were normal. The patient barked continually when the owner or his wife left him. Chloral hydrate was administered internally, the patient received the best of care, and was carefully guarded from excitements. On the third day the symptoms were more pronounced, the patient laying flat on his left side, fore and hind extremities in a continual tetanic spasm; convulsions of the whole body. The tail was voluntarily immovable, the head was spasmodically extended backwards, the spine had a downward curve (opisthotonos). The membrana nictitans appeared extended over the eyes. The ears were somewhat elevated, and pointed backwards. The expression of the animal betrayed great anxiety;

consciousness was normal. At this time deglutition was interfered with; the patient foamed continually from the mouth. The appearance of trismus was noticeable. The animal was destroyed according to the desire of the owner.—(*Berl. Thierarzt. Wochenschr.*)

INTERNAL TREATMENT OF LAMENESS WITH IODIDE OF POTASSIUM [*Schenkel*].—A horse, manifesting lameness on the near hind leg, was brought before the author, and diagnosed by him as a chronic inflammation of the hip-joint. Strong liniments were applied, until considerable irritation of the skin was noticeable, but without producing beneficial results. Considering that the affection of the joint might be of a specific nature, he resorted to a treatment with iodide of potassium. With daily administrations of 10.0 gm. of the drug, after five days a remarkable improvement was noticeable, which after five more days advanced so far that the lameness disappeared, and the horse was again useful for its regular work. A dog affected with the nervous form of distemper, recovered from the same, leaving only a lameness on the right fore leg. External applications of several remedies failed to produce noticeable improvement, until iodide of potassium was given in 1.0 gm. doses, which soon brought on a complete recovery.—(*Schweitzer Archiv. f. Thier.*)

INTRAVENOUS INJECTION OF ESERIN-ARECOLIN [*Barnick*].—A well-nourished work horse, eight years of age, suffering for eight hours with colic due to impaction, received from the owner a drench, containing 1.5 gm. chlorbarium, 30.0 gm. of aloes, in hot water, and to this was added enough warm water to fill a wine bottle. As this dose failed to act, the author was called and he proceeded to give an intravenous injection of 0.4 gm. of chlorbarium, but, due to a mistake, took the bottle containing eserin sulph., et arecolin hydrobromate, āā 0.05 gm., in 10.0 gm. of aquæ dest., and injected the same intravenously. The action of the same caused in 10 to 20 seconds staggering, profuse salivation, strong accelerated respiration, profuse perspiration, and falling to the ground. The pulse was rapid, almost imperceptible, the mucous membranes highly congested; intestinal peristalsis was present on both sides. About 2 to 3 minutes after the injection a profuse diarrhœa appeared, by which enormous quantities of the liquefied contents of the intestines were expelled. The author administered some strong coffee and brandy. Half an hour later the horse got up, appeared healthy and showed no after-effects whatsoever. The author

concludes from this case, that while the intravenous injection of eserin-arecolin is dangerous, it is not fatal; that this combination surpasses all remedies regarding quick action, and for these reasons recommends it for trial to establish its effectful minimal dose. It is also probable that the heroic action of these agents were increased in this case, by the remedies administered by the owner.—(*Zeitschr. f. Veterinärk.*)

Ruptures of the Rectum in Mares [*Heichlinger*].—A very fiery stallion, always refusing to permit the directing of the penis, entered in two instances during the act of covering into the rectum. In one of the mares the rectum was completely perforated about 10 cm. in length. The animal was led home, a distance of about 1½ hours journey, and succumbed after seven hours, with manifestations of colic. In the other mare the intestinal wall was not completely perforated, but the muscularis separated from the mucosa in a 25 cm. long pocket. The animal was brought on the following day to the author, a distance of about nine miles. The treatment consisted of rectal injections. However, the condition growing worse, the animal was destroyed seventy-two hours after the injury. In the base of the pocket the peritoneum was found exposed and through this invading of intestinal contents was made possible.—(*Wochenschr. f. Thierheilk.*)

A Remarkable Case of Anthrax Poisoning.—According to a notice in the *Allgemeine Fleischer Zeitung*, an inhabitant of the village of Roddenan died from anthrax. He fed his two dogs with the meat of a cow's carcass affected with anthrax. One dog having a sore on the mouth also died from the disease. It is supposed that the infection in the man was caused through a sore on his hand, which was frequently licked by this dog.

A Disease Similar to Texas Fever Attacking Cattle in German East Africa [*A. Brauer*].—In East Africa a disease is found to be prevalent having a similarity to Texas fever. The clinical symptoms are constipation, diarrhœa, in which the fæces are mixed with some blood. Slight fever in the early stages, later reaching the height of 42.8° C. Pulse and respiration are accelerated. The appetite remains good up to the end. Hæmoglobinuræ does not appear. The duration of the disease varies from 4 to 14 days; the death rate reaches 50 per cent. In 1 to 75 per cent. of the red blood corpuscles, round parasites growing out to rods are noticeable, and which form later into round cysts. Brauer is of the opinion that the disease can be spread by cattle transportation.—(*Berl. Thierarztl. Wochenschr.*)

Hæmorrhage in the Cerebellum Resulting from Inflammation [*Prof. J. Marek*].—The affection appeared suddenly in a five-year-old dog with trembling convulsions, affecting the patient at intervals of 10 minutes. During the intervals the animal manifested dizziness and stepping sideways, moved in a circle. On the second day of the affection the dog was brought to the hospital in a complete insensible condition. Temperature was 38.9° C., pulse 130, respiration 30 per minute. Almost regularly at 15-minute intervals, attacks of convulsions of 4 to 5 minutes duration, affected the animal in such a manner that the dog, after getting up, moved to the left in a circle, finally falling; at such times twitchings of the muscles of mastication, also in the flexors and extensor muscles of the leg, were observed. Urged to walk, the patient moved to the left (manège walk) in a circle, gradually diminishing the diameter, until finally using the hind legs as a fixed point moved in the manner of the handle of a clock. A painful or tender spot on the head could not be located; the sensibility was all over diminished (due to the disturbance in the consciousness), both pupils were contracted to the minimum, not responding to light; the superficial reflexes were diminished, the tendinous reflexes were normal. On the second day of the affection a comatous condition appeared, the patient dying in a short while. The autopsy revealed a grayish red knot, of the size of a pea, in the white substance, in the anterior portion of the cerebellum, also numerous needle-prick-like hæmorrhages in the hemispheres of the cerebrum.—(*Veterinarius.*)

Behring's Immunizing Material.—The experimental success of von Behring's immunization against bovine tuberculosis is probably known to most veterinarians. As I have previously reported, a large number of young stock in Germany and Hungary received the immunizing inoculations, of which the results are yet unknown. Dr. Siebert's and Dr. Ziegenbein's institution, in Marburg, a. d. Lahn (Hessen), distributes the immunizing material for the following prices: 20 I. E. (immunizing units) 40 pf. (10c.), when ordered in larger quantities, 25 pf. (6c.). The immunizing material is distributed in small glass bottles, containing 10–20 I. E. The material is sold under conditions that the results of the inoculations will be reported, as desired in the accompanying instructions, to the institution. It would be very desirable if some of our colleagues would undertake this method of immunization, as I have no doubt that a number of dairy owners, etc., would only too will-

ingly agree to have their growing stock immunized against one of the most dreaded maladies. Conclusive results can only be obtained from very numerous inoculations.—(*A. E.*)

ENGLISH REVIEW.

By Prof. A. Liautard, M. D., V. M.

Urethral Calculus [*F. A. Ashley*].—A three-year-old colt for two months has shown difficulty in making water. He stretches himself, makes some efforts, but expels only a few drops of urine. One day he is taken with colic and the author is called. In examining him per rectum, the bladder is found largely distended and the introduction of a catheter is stopped after passing in about three inches from the opening of the urethra. A knitting needle is introduced in its place, and soon strikes and scrapes against a hard body, which evidently is a calculus. It is night, and operation is impossible. Under the circumstances 6 grains of morphia are given, with directions that if the animal seems worse to send for him and he will puncture the bladder per rectum. The next morning the conditions are rather worse; an operation is imposed. The author hesitates which method to use, as he is alone and no one to help him. Finally, he injects 8 grains of morphia under the skin, administers a drench containing 2 ounces of chloral, and when, after waiting ten minutes, the horse is about staggering, he pushes him against the wall with the left hand, takes hold of the penis, pulls it out of the sheath, and with the bistoury in the right hand makes an incision in the length and through the urethra, extending from a point above the seat of the calculus down to the point of the urethra. A large stream of urine follows, but the calculus is not displaced. Incrusted in the mucous membrane, it has to be pulled away. There has been but little hæmorrhage. The penis is let loose, the region well disinfected, and the opening of the sheath closed with two stitches, which is removed after two days. Recovery is complete.—(*Vet. Record, Nov., 1903.*)

Hæmorrhoids in a Mare [*F. A. Ashley*].—This mare was turned out with her colt, and was bleeding at the anus. She was lying down and exhibited colicky symptoms. The author made her get up, and then observed bulging out of the anus a mass of a blackish red color and as big as the two fists of a man. Of firm consistency, the tumor was constituted of

clotted blood. The mare was placed in her stall, on an inclined floor by thick bedding of manure under her hind limbs, and fomentations of warm water prescribed. After an hour of this treatment, a puncture was made with a fine trocar without any result. Then soft embrocations of vaseline were applied, and little by little with gentle pressure the growth was pushed back in the rectum. The animal was then given an injection of morphia to permit a rectal examination. This revealed the presence of two other tumors, half the size of the first. The rectum was full of an enormous quantity of very hard fæcal matter, more than a pailful. A purgative was ordered and also repeated oily and mucilaginous injections. During three days the mare had no natural passages, the tumor now and then making its appearance outside, under the strains of the animal. It was returned at each time and the rectum emptied. Little by little, however, under a laxative *regimé*, the intestine recuperated its normal functions, defecation took place naturally, and the rectal tumors disappeared, and never returned.—(*Vet. Record*, *Nov.*, *1903*.)

Actinomycosis—Iodide of Potassium [*Mr. Peale*].—At a meeting of one veterinary association, the author reported the history of a case of actinomycosis in a bull of Norfolk breed, which had been manifested for about three months. The disease had invaded the palate and the upper lip. The animal was of great value; he was unable to close his mouth. Four drachms of iodide were prescribed. After a few days there was a large swelling of the testicular region. After ten days of treatment the animal was saturated with iodide; he had a pitiful aspect; his eyes were crying; in fact, showed the symptoms of iodism well marked. The treatment was stopped; the animal gradually improved; took hold of his food, chewed well; finally recovered. But since the treatment he has lost all sexual desires and cannot mount a cow. This effect of iodine is already known in human medicine. Is this case the first observed in veterinary practice? as, says the editor of the *Record*, it would be interesting to know if similar conditions have been already observed and if this result is permanent or temporary. —(*Vet. Record*, *Nov. 21*, *1903*.)

Hernias Following Castration of a Cryptorchid [*Rich. Hudson*, *M. R. C. V. S.*].—A two-year-old colt, cryptorchid of the left side, is operated. The manipulations are very difficult on account of the presence of a large mass of the omentum. When two days after the operation the sutures are re-

moved, a small portion of the intestine was found adherent to the edges of the wound. Attempts at reduction were used on different occasions, and finally the tumor became as big as a foot ball, on the centre of which the uncicatrized skin allowed the detection of the intestine. It was decided to operate. With two ounces of chloral the animal was put to sleep and cast. The operation was very delicate on account of the adhesion of the intestine, but finally, with careful and minute dissection, two intestinal loops, measuring three feet each, were returned into the abdomen and the wound closed with a long clamp applied as high as possible and reinforced by metallic sutures of wire through the envelope. Recovery took place without complication and the horse was apparently perfectly cured for four months. After that time, the hernia made a second appearance. A second operation was performed, followed by the same results. The horse was turned out and after three months there remained nothing of the two severe operations he had been submitted to. Several days later, however, he was found dead in the field. At the post-mortem, the scrotum was found as big as a cocoanut and in its centre there was a small portion of the intestine, strangulated in the inguinal ring. The author remarks that in cases of cryptorchidy, where dangers of hernia are always to be feared, sutures and strapping ought not to be neglected. They never do harm, assist the asepsis of the parts and prevent the descent of the intestine.—(*Vet. Record, Nov. 28, 1903.*)

Fracture of the Os Calcis [*E. Wallis Hoare*].—After jumping over banks a mare was found dead lame on the off hind leg. She had great pain, was uneasy, and in moving her hock was strongly flexed, the tendo-Achilles relaxed, the tuberosity of the os calcis displaced forwards. There was marked crepitation and a sharp portion of the posterior edge of the bone was slightly protruding through the perforated skin. The animal was destroyed. The fracture of the os calcis was found extending from the upper part of the posterior surface of the tuberosity downwards; on the external aspect, there was a triangular fracture, which separated a portion of the body containing the articular facet for the cuboid bone. A small portion of the articular cartilage was loose from one of the facets of the astragalus. In fact, the bone was broken in three pieces.—(*Vet. Record, Dec. 5, 1903.*)

A Case of Abscesses of the Spleen with Gastric Ulceration and Gastro-Splenic Fistula [*A. L. Williams*].—Eight-year-old horse is reported sick, off his feed, dull, yel-

lowish eyelids, temperature 105.2° F.; blood on microscopic examination shows great increase in leucocytes. Treated as bilious fever with salines, fibrifuges, biliary stimulants, salicylic acid. Later temperature rises to 106.2° F.; the patient is weak, staggers, has subacute abdominal pains, grunts, looks towards the side, exhibits breathing of pleuritic trouble, and yet no sign of pleurisy is detected on auscultation. Has times when he is easier, then diarrhœa sets in. The pulse becomes irregular, heart's action is intermittent, depraved appetite; the horse eats mud and chews dirty bedding. Later salivation of ropey mucus, which stops and returns. Finally after 13 days of sickness the horse dies comatous without a struggle. At the post-mortem the spleen is found weighing 22 pounds and forms a gangrenous mass, containing several large abscesses through its structure; the inside of these is filled with gangrenous fœtid matter. There is an ulceration of the stomach at the junction of the cuticular and villous coats; it has the appearance of an old lesion. There is a fistulous tract connecting the ulcer with a splenic abscess and there is a free passage from the stomach into the abscess. There is also general peritonitis.—(*Veterin. Journal, Dec., 1903.*)

Tuberculosis in an Australian Opossum [*Maj. J. Moore*].—Certainly, as the author says, "This is an interesting case." In 1895 two opossums were given to him; they were each six months old. After six weeks one was found one morning suffering with paralysis of both hind legs. As they were kept in a house made of wire netting, it was first supposed he had fallen in climbing against the walls and injured himself, but on examining closer one of the stifle joints was found much enlarged. A few days after the little beast died, and the post-mortem revealed that the lungs were one mass of tubercles. The other opossum remained apparently healthy for a year and ran away. —(*Veterinary Journal, Dec., 1903.*)—[Were these true or only psuedo-tubercles?—Editor.]

Roaring and Thoracic Cyst [*W. Hughes*].—Aged mare, which has been steady working for years, one day while in double harness stopped, became very excited, began to tremble, showing symptoms of suffocation, and roared. Taken to the stable, these gradually disappeared. After a few days she was taken out for a drive and after 50 or 60 yards exhibited the same symptoms. She fell down, her respirations were difficult, the heart quick and irregular, hard and bounding. After a while, she was herself again, and still nothing could be detected

to explain the trouble. A third time, when taken out, the same manifestations occurred and tracheotomy was suggested and decided upon. While the preparations were being made for it, she had a more severe attack, roared, roamed about, and died in six or eight minutes from asphyxia. At the post-mortem a large cyst was found at the base of the heart and large blood vessels, exerting pressure on the left laryngeal nerve, and causing the symptoms of suffocation. The cyst had very thin walls and contained about a pint or more of serous fluid. It must have been of recent origin, as the animal worked as usual up to twelve or fourteen days of her death. The laryngeal nerve was stretched round the posterior aorta and the cyst, which lay in front. It would have been interesting to know if tracheotomy would have been successful.—(*Veterinary Journal, Dec., 1903.*)

DRS. A. PLUMMER, R. H. Power, U. S. Cavalry, Fort Riley, and Drs. S. L. Hunter and O. M. Norton, U. S. Cavalry, Fort Leavenworth, Kansas, attended the meeting of the Missouri Valley Veterinary Association, held in Kansas City, Feb. 15.

THERE has been a committee appointed by the President of the Missouri Valley Veterinary Association, in accordance with a resolution passed at the recent meeting, to confer with and assist any committee of any State in the Missouri Valley in its effort to secure needed veterinary legislation.

DR. ROBERT DICKSON, of New York City and Seabright, N. J., has purchased a beautiful little farm near Seabright, with a large house and barns, and will convert it into a convalescent hospital and boarding farm. Rumor has it that the doctor is decorating his new house with great care for the reception of his bride, who is a most estimable lady of Seabright.

AT the recent meeting of the Missouri Valley Veterinary Association thirteen veterinarians handed in their names to Secretary Kaupp as subscribers for the REVIEW, he having volunteered without our knowledge to receive them ; and in Michigan Dr. H. F. Palmer, of Detroit, announced his willingness to receive subscriptions, the result of which was that eight new names were forwarded to us. These acts of practical kindness are greatly appreciated, and the gentlemen mentioned will have the satisfaction of feeling that they have performed a service which has a triple benefit—they have done a good service for the REVIEW, a greater one for those who will receive the journal, and incidentally the cause for which we are all laboring will be advanced.

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

A NEWSY LETTER FROM DR. C. H. JEWELL.

CAMP STOTSENBURG, PAMP., P. I., Jan. 3, 1904.

Editors American Veterinary Review:

DEAR SIRS:—Under separate cover I send you an article on "Contagious Ulcerative Lymphangitis" * as I have seen it. If you deem it of sufficient interest for publication, please insert it; if not, cast it into the waste basket. I believe the accompanying photographs of an advanced case may interest you as well as the readers of the REVIEW. I believe we need more literature on the Philippine diseases, since they are so very different from what we meet in the States.

The REVIEW is a welcome visitor, although it is a month late. I read with much interest the account of the American meeting at Ottawa, and regret not being able to attend.

Glanders and surra seem to be on the wane, especially in this province. There has not been a single case of either in this post during the past two months. Periodic ophthalmia is one of the diseases which causes a great amount of loss, since they sooner or later go blind. I cannot find any treatment which gives any but temporary relief. Thrush and canker we have all the time, and it is very much worse than what we have at home.

The question of obtaining legislation to advance our standing in the Army is one of vital importance to the veterinarians in the service. I believe that by sending our petition to the Secretary of War through military channels it might result in some good. If not, then we must depend upon the American Veterinary Medical Association to assist us.

The work of the veterinarian in the Philippines is making a favorable impression upon army officers in general. I believe

* Will be published in the April number.

proper recognition is bound to come, but not without some effort. Rank is the only thing which gives an officer proper recognition in the Army, but legislators do not know much about army life. One must associate with army people to know the peculiarities of the service.

Do not stop the REVIEW at the end of the year, but send it with the beginning of the new year, and I will remit at once. It takes some time for communications to pass between us, and during the time I do not want to be deprived of it a single issue.

In the Medical Department the doctors are supplied with all medical books and periodicals, while the veterinarian must supply his own.

The climate here is delightful, especially during the winter months. I am certainly agreeably surprised. I am,

Respectfully yours, CHAS. H. JEWELL.

A CANINE CEMETERY ON LONG ISLAND.—*Central Islip, L. I., February 12.*—The Idlewild Canine Cemetery Association is the name of a new corporation which has just taken title to a five acre tract north of the depot here, and which will be used exclusively as the final resting place for dogs whose owners have means sufficient to purchase a plot. Mrs. Myra St. Maur Stephens of West Hoboken, N. J., is at the head of the corporation. Mrs. Stephens is now arranging for the clearing of the land, and will, as soon as the weather permits, begin the work of dividing the five acres into burial plots. It is reported that Mrs. Stephens will have for her patrons many prominent dog fanciers in both New York and Brooklyn, who at present are forced to dispose of the remains of their pet canines in a manner shocking to their sensibilities. The cemetery is the only one of the kind on the Island, and the plots will doubtless be sold without difficulty. The plan is to have the ground laid out without regard to time and labor, in order that the cemetery will present a fine appearance. Little further could be learned of the plans of Mrs. Stephens and those who are associated with her in the movement to provide a suitable burial place for pet dogs, but it is surmised that the graves in the canine cemetery will be marked with handsome stones, on which will be inscribed the name, etc., of the dogs buried there. There are, on several of the larger country places on the south side of the Island, burial grounds for dogs and cats.—(*Brooklyn Eagle.*)

CORRESPONDENCE.

SIPHONING THE STOMACH IN ACUTE INDIGESTION BY WAY OF THE NASAL CHAMBER AND ŒSOPHAGUS.

ST. LOUIS, MO., Feb. 12, 1904.

Editors American Veterinary Review:

DEAR SIRS:—It has recently come to my notice that a demonstration of the operation of siphoning the stomach of the horse in cases of acute indigestion by passing a tube through the nasal cavity and œsophagus, was given at the late meeting of the Illinois State Veterinary Medical Association at Chicago.

I am very much interested in this operation, as it is not a new one to me, since I have employed it in my practice for the past ten years, with very gratifying results. Realizing the practical importance of the operation to the profession generally, I brought the subject up in the Post-Graduate Class of the Chicago Veterinary College (Dr. L. A. Merillat being present) in the latter part of January, 1903, and demonstrated the procedure before the members of the class; later I did the same for the senior class, and still later for the students collectively—three demonstrations in all at the Chicago Veterinary College. I also made two demonstrations at the McKillip College.

The success of the operation depends largely upon the kind of instrument used, and I hope to perfect one in a very short time that will insure success in every instance, with the object of establishing this method of instant relief in a very often fatal condition as a standard operation in veterinary surgery.

In a short time I will be pleased to write the REVIEW an article, going fully into the subject, and detailing the various steps of the operation. It is extremely simple, and any qualified practitioner can pursue it successfully from a simple description of the method to be pursued.

Very truly yours, J. M. PHILLIPS.

INFECTIOUS (?) ULCERATION OF LIPS OF LAMBS.

MANHATTAN, KANSAS, Feb. 3, 1904.

Editors American Veterinary Review:

DEAR SIRS:—About the 1st of December, 1903, I was called officially to examine a bunch of 10,000 New Mexican lambs that were being fattened for the market in North Central Kansas. The lambs were shipped in early in November and were

being fed alfalfa hay and ear corn, the latter scattered upon the ground. They were watered from a well pumped by an engine. About the middle of November a number of lambs were noticed to have sore lips, and in the course of ten days the disease had spread until about one-half the lambs, or 5000, were affected. The first symptom noticed was one or more blisters upon the lips; in some cases they occurred on the nose or face nearly to the eyes. The blisters soon burst, and a raw, angry granulating sore followed that was soon covered with dark brown or black scabs one-half inch thick.

The accompanying cut from a photograph of a severe case well illustrates this condition. In some cases the ulcers extended until they involved the inner surface of the lips.

The disease ran its course rapidly, and in ten weeks practically all made a complete recovery, without treatment. In a few cases the ulcers were so extensive that the lamb was unable to eat, and died from starvation.

A microscopical and bacteriological examination gave practically negative results. A green pus-producing organism was found in abundance, but inoculation tests upon a lamb were negative. The disease did not attack older sheep that were running with the lambs.

Sheep men of wide experience had never observed anything like it before. Some thought it might have been caused by cactus thorns, as cacti were plentiful in the region where these lambs were purchased, but there was no evidence of thorns in the tissues; older sheep were not affected, and there were no symptoms of the disease for at least three weeks after they were removed from the cacti country.

This disease is new to the writer. Dr. Kirschner, Federal Sheep Inspector for this region, had never observed it, nor have I been able to find any description of such a disease in the literature at my command. If any reader of the REVIEW can give me any information regarding this disease, either through the REVIEW or by letter, it will be greatly appreciated. N. S. MAYO.

PARTURITION IN THE SOW.

SALINA, KANSAS, February 18, 1904.

Editors American Veterinary Review:

DEAR SIRS:—Through the pages of the REVIEW, let some one or more veterinarians give some good pointers on their success in extracting pigs—what they consider the most practical forceps, and what success and details as to how they perform the operation of taking them through the abdominal wall.

HUGH S. MAXWELL.

HORSE KNEW LAND WAS NEAR.—When Thomas McGuiness, a well known horseman of Philadelphia, went to Europe some time ago, he took a blooded horse with him. The animal was in a specially prepared stall on deck and enjoyed the trip despite the rough weather. When Mr. McGuiness thought land should soon be sighted, he asked the captain how far the ship was from the Irish coast. The commander of the steamer, in his usual gruff manner, replied: "Your horse will tell you; watch him." The owner of the animal could not understand what the captain meant, and he was not particularly pleased with the answer. Finally, however, a couple of hours before land was observed, the horse, which was a magnificent bay, poked his head through the grating, and, stretching his neck, whinnied loudly. "There you are," said the captain to Mr. McGuiness, "your horse smells the land." The horse was like a different animal thereafter until the coast loomed up. The captain, in explaining the odd occurrence, said that the thoroughbred detected the odor from pasture lands that was wafted far seaward, and that horses on board ocean steamers always give the first signal when land is near.

SOCIETY MEETINGS.

IOWA STATE VETERINARY MEDICAL ASSOCIATION.

The 16th annual meeting was called to order in I. O. O. F. Hall, Des Moines, Jan. 27, 1904, at 11 A. M., by President T. A. Shipley. The Secretary announced the card system of registration instead of roll-call. The Secretary read the minutes of the previous meeting as published in the *Journal of Comparative Medicine*. Moved by Dr. J. Miller that minutes be accepted as read. Seconded by Dr. Koto; adopted.

The President presented his address, as follows:—

PRESIDENT'S ADDRESS.

"*Fellow-Members and Friends:—*

"Agreeable to your wishes as expressed by ballot at the last annual meeting, it becomes my pleasant duty to welcome you to this our sixteenth annual meeting of the Iowa State Veterinary Medical Association.

"I again thank you for the honor you have thus conferred upon me. Custom or precedent more or less well established has also decreed that the President shall, at the opening of each of these annual meetings, deliver himself of the more weighty and wise or otherwise thoughts that have appealed to him most pertinently regarding veterinary matters in general and our own organization in particular, that have occurred during the interval between these meetings, or that should be considered at this time.

"The year just passed has been one of steady and irresistible progress in the veterinary world. The status of veterinary science in the domain of medicine has become more clearly and firmly established on the important plane to which it of a right belongs. There has always been a more or less popular impression that this branch of the profession lacks finish, lacks dignity, in short is not a science. That there has in the not far distant past existed reasons for this impression, cannot be successfully denied; but they have largely vanished and veterinary science is fast gaining the respect which it deserves. Its history is co-equal with that of medicine. The early writers of either human or veterinary medicine are equally amusing and erroneous as viewed in the light of modern research.

"The first organized attempt to teach veterinary science

dates back nearly a century and a half ago, when in 1761 was founded the veterinary college at Lyons, France, and has remained as a progressive and influential institution ever since. From that time on veterinary science has expanded in every way; schools and colleges have multiplied until the whole civilized earth is dotted with them. Every European country has them and every European country, with one or two exceptions, has one or more government schools or colleges, and some of them have been raised to the rank of universities. Now nearly every prominent medical school has its chair of comparative medicine, especially in the French and German universities. In the report of public instruction which Talleyrand read in 1790 before the French National Assembly, he advocated a veterinary training as a necessary preliminary and accompaniment to the study of medicine. In our own country, veterinary science has been slow in developing; nearly all of its schools are less than 20 years old; and while we have a population of about one-fourth that of all Europe, the number of veterinary students is only about one-tenth. The reasons for this are various. As our country becomes more thickly settled and more animals as well as more people must find subsistence on a given area, the animals become more valuable; and also on account of more artificial life, more and more subject to disease. Again, this country has never been burdened with the support of such immense standing armies with their large proportion of cavalry which has called early for an organized veterinary service, with official veterinarians in most countries with full army rank and pay. These considerations had their weight in attracting men of talent to the profession. The last of the older governments to accord her veterinarians deserved recognition has been England, whose veterinarians within the last year have succeeded in obtaining a royal warrant from His Majesty's government, the provisions of which are entirely satisfactory to the most fastidious veterinarian. This success of the English veterinarian in at last obtaining proper recognition from his government should put courage, vigor and determination into an unceasing effort, individually and collectively, of every veterinarian in this country to bring about a like recognition of our services for our government. That it will finally come, when the general public are rightly informed of its necessity, is not a question of debate; it is only one of how soon this condition of education can be brought about.

"Notwithstanding the slow growth of veterinary matters in

this country, the outlook was never brighter; there is a rapidly increasing list of appointments open to the educated veterinarian. Federal, State and municipal governments are everywhere awakening to a realization of their eminent fitness as sanitarians. Their work in staying the spread of animal epidemics has been of inestimable value to the stock-owner directly and to every one indirectly dependent upon him.

"But the work is only begun; there is much yet to be done in every department of the art and science of veterinary medicine. How can you and I do most to further its progress is the vital question of the hour. No great objects can be accomplished without organization. It is a pity to give up to party what was meant for mankind. But every man must work with other men. The 'I am holier than Thou' was a very bad motto for the Pharisee and it is a very bad motto for the professional man. A strong national organization is made possible by the support drawn from good live State organizations; and State organizations should foster and encourage, wherever possible, the county organization from which it might draw largely for its support. If we had a local corresponding secretary in each county to take up the matter of local organization under the direction of the State Secretary of our State society, what vast amounts of good might be accomplished by enabling the State Secretary to compile and edit various statistics and direct individual effort in channels of interest and profit to our Association. Indeed, I believe if we are to get the fullest benefit from our present State laws, or any other better laws that we may succeed in having passed, we must have some kind of an organization to prosecute offenders. If we could form some such organization as the Bankers' Mutual Protective Association, so that we could have the means necessary, and an alert official whose business it would be to get evidence and bring the matter with some force before the proper prosecuting officer, there would be a wholesome fear and respect for what little laws we had. There is little use of any law which is not or cannot be enforced. There might be, by this same agency, compiled a black list which would be State wide; and above all, this work locally would tend to break down little local, petty, professional jealousies, that we fear are altogether too common in this profession. There ought to be a larger spirit of tolerance toward our local brother practitioner. That he is entitled to his honest opinion, though that opinion may be different from ours, is evident, and, indeed, I see no good reason

why doctors have not the same right to honest difference of opinion as have lawyers or theologians; they certainly do not deal with less complicated or perplexing theories or conditions. But each of us should learn to apply the lines of the immortal Shakespeare, 'And do as adversaries in law, strive mightily but eat and drink as friends.' This kind of local harmony all over the State is a consummation devoutly to be wished for. Will you put forth your best endeavors to promote it? I sometimes think that if the veterinary profession had some of the opposition to overcome which harasses the medical practitioner in the way of such fallacious theories and popular vagaries as Christian Science, Spiritualism, Dowieism, and other allied doctrines that do not seem to apply to any alarming extent in veterinary practice, we should indeed all have to hang together or very certainly hang apart. The practical uselessness, however, of thus moralizing on occasions of this kind, is that we do not reach those that most need to profit by these suggestions, for they are not here, in fact they hardly ever attend veterinary meetings or subscribe to any veterinary journals; they certainly need missionary work. How are we to reach them? The power of a good example set them is an almost irresistible influence for good on those that are desirable; the rest we will probably have to do without.

"In the more practical every-day practitioners' world there are many things we note with pleasure; among which might be mentioned the prevailing tendency to a more rational and simple treatment for many diseases and conditions; for instance, who of you that have attended these meetings, both State and national, for ten or fifteen years back, do not remember the learned and lengthy discourses relating to the cause and treatment of the so-called paturient apoplexy in cows; almost every available drug on the lists of the most prominent drug houses has at some time or other had its advocates. But that was in the dark ages, so to speak; the light began to dawn some few years ago when the Schmidt treatment appeared on the horizon, and now this treatment has—as the mists have cleared away—been simplified, until air only seems to be the essential feature of a treatment more efficacious than any hitherto advanced. *Hot air* if you please, for the owner, but for the patient just ordinary clean air; the efficiency of the air is said to be enhanced by the use of a little clean water; the efficiency of the *hot air* is usually enhanced by the use of a little harmless coloring matter in the water. You will doubtlessly infer that the practic-

ing veterinarian must be an adept in handling men as well as animals. We believe that medical science in general is tending toward this simplicity and directness of treatment, for it seems that the most important and efficient factors in the problem of the suppression and eradication of the great white plague, tuberculosis, in man and animals, are uncontaminated air and uncontaminated food and sunshine. We hope that our Committee on Diseases and Treatment may at no distant future be able to start going something that will be equally successful in the treatment of azoturia, for it seems to be getting to be about as big a stumbling block as parturient paresis has been. It is certainly not to to be denied that hygienic measures are as equally important, but much harder to put into effective operation than therapeutic measures, because we have to deal with much deep-rooted prejudice and want of information concerning the necessity of cleanliness, fresh air and sunshine for both man and beast, and especially so where the diseases are intercommunicable. There is an increasing tendency in the practice of physicians toward the use of animal glands and extracts for the treatment of human ailments that have been hitherto little amenable to treatment; also in the favoring condition of the blood of many of the domestic animals, the antidotes for numerous pathogenic organisms and many poisons are produced or separated. There are in this way some almost priceless acquisitions for the treatment and prevention of disease in man. This field is a promising one for the veterinarian both as regards the supervision of its products and the opportunities it offers for original research.

"But why worry you further? Every view is an assuring one. True there is much yet to be done. Many questions that nature and science propound are in need of investigation and so numerous and far-reaching are the propositions that no one mind in one short lifetime can comprehend them all. Yet by constant study and investigation we are moving forward and upward toward the grand perfect consummation, which, though ever nearing, we may never reach; but it is encouraging to know that in pursuits like ours there are pleasant surprises and unusual delights, for as you press your way onward and upward your vision will be feasted with broader and more panoramic views until you at length stand upon the serene and towering heights of professional fame; but when you have reached this summit and look beyond, be assured you will see other mountains above you, and other beings upon their brows yet moving upward still in an endless progression; and as you strive to be in sympathy

with Truth you may hear them whisper 'Excelsior' to your ardent and aspiring spirit.

"It remains only for me to note the absence of the Secretary whom you unanimously elected at your last meeting. His resignation was accepted on account of his removal from our State. It is a well-conceded fact that the life and influence of any of these societies depends largely upon its Secretary. He should be a man of energy and unflagging zeal. Iowa has been favored with a succession of admirable secretaries, to which our society owes a debt of gratitude. Dr. Repp had no small task to fulfil expectations in following Dr. Brown. Both are with us no more; neither are lost to the profession; and we content ourselves with the thought that Iowa's loss is some other State's gain.

"In appointing Dr. Simpson to take up the work where Dr. Repp left off, I have followed the precedent established by a former President. I believe you will have no reason to censure me in my selection; and we should congratulate ourselves on having at hand one so fit and able to carry on this work with unabated vigor.

REPORT OF SECRETARY.

The Secretary read his report as follows:

"*Mr. President and Members of the Iowa State Veterinary Medical Association:*—

"Dr. J. J. Repp, your Secretary and Treasurer, leaving the State in August to go to Philadelphia to take up the study of human medicine, I was appointed by President Shipley Secretary and Treasurer *pro tem.* I did not realize before the appointment the amount of work the Secretary of this Association had to perform.

"In October I attended the meeting of the Iowa-Nebraska Veterinary Medical Association. A number of our members were present, and being solicited for a paper or a report of a case, a number promised to help the programme by one or the other. In November I sent a circular letter to all members of the Association reminding them of the coming meeting and asking for help on the programme. A number sent favorable replies. But still there were not enough, so I sent out a personal letter to a few who can almost always be relied on, and with their aid I was able to get up the programme which you all have. The committee on clinic of course attended to their part most satisfactorily.

"Right here I would like to suggest to some of the apparently backward members that they are just as capable of preparing something for the Association as any one, and the paper is interesting and instructive to all members, but much more so to them because the man who offers a subject always looks the matter up thoroughly, and they can lighten the worry and work of the Secretary a great deal.

"At the same time I sent out a circular letter to all registered graduates, holding up the advantage of membership, enclosing an application blank and asking them to join. A number sent in their applications and I understand there will be others presented to-day.

"I also wrote all suspended members whose addresses I found, notifying them of the action taken last year at Cedar Rapids regarding suspended members, and requested them to pay up and be reinstated. A few have taken advantage of the favorable terms and have asked for reinstatement.

"The last letter sent out January 16th was delayed on account of not being able to secure a hall until just before the letters were printed. My thanks are due to Dr. H. E. Talbot for looking up a hall for our use.

"I tried to secure reduced rates for the meeting from the Western Passenger Association, but at present there are not enough members of the Association to receive any favors of that kind, one hundred in attendance being necessary for favorable action.

"I have only found two copies of our Constitution and By-Laws. I would like to suggest that the old books of the Association be gone over by a committee appointed for the purpose to look for any changes of the by-laws, and that there be printed a couple of hundred copies of the by-laws for present and future distribution, and that the names of all members of the Association be included in this book; also blank pages for new names.

"From correspondence I learn that all veterinarians in the State are doing a good business. I believe all have reported this as the largest year's business they have ever had. Several have reported that they would be in attendance upon this meeting if business would slacken up enough to permit them to get away."

REPORT OF THE TREASURER.

The Treasurer read his report as follows:

SIXTEENTH ANNUAL MEETING, January 27–28, 1904.

FOR DR. J. J. REPP.

Receipts:

Cash on hand Jan. 12, 1903	$48.10	
Cash for Dues Jan. 12 to Aug. 24, 1903	53.00	
Cash for Membership Fees, Jan. 12 to Aug. 24	12.00	
Cash for Letter File Cabinet	3.50	
		$116.60

Disbursements:

Cash, J. W. Griffith, Clinic	$10.00	
Cash, Lawrence Printing Company	4.00	
Cash, Secretary Allowance	25.00	
Cash, Editing and Typewriting Proceedings of 15th Annual Meeting	20.00	
Cash, Ames Times	4.50	
Cash, Stamps	5.50	
Cash, Kistler	3.50	
Cash, Judish Bros	1.50	
Cash, Express, 2 pkgs., 1 Shipley and 1 Simpson	1.20	
Cash, Journal Comparative Medicine	1.20	
Cash, American Veterinary Review	1.25	$ 77.65
		$ 38.95

FOR HAL C. SIMPSON.

Receipts:

To Cash from Dr. Repp, Aug. 24, 1903	$38.95	
To Cash from Dues, Aug. 24 to Jan. 26, inclusive.	8.00	
To Cash Membership Fees, Aug. 24 to Jan. 26, incl.	12.00	
		$ 58.95

Disbursements:

By Cash, Oliver Typewriter Company	$ 3.00	
By Cash, Denison Review	10.50	
By Cash, U. G. Johnston & Co	3.60	
By Cash, Denison Bulletin	4.50	
By Cash, Stamps	12.00	
By Cash, Badges	16.00	$ 49.60
Balance in Treasurer's Hands Jan. 26, 1904		$ 9.35

Respectfully submitted, HAL C. SIMPSON, *Treasurer.*

Moved that a committee be appointed to audit the Treasurer's report. The President appointed P. O. Koto, C. A. Clinton and J. W. Haxby. The Auditing Committee made the following report: "We, the Auditing Committee for the Sixteenth Annual Meeting of the Iowa State Veterinary Medical Association, hereby certify that we have examined the above account of the Treasurer and that we find it correct.

"(Signed) P. O. KOTO,
"C. A. CLINTON,
"J. W. HAXBY."

By vote of the Association the report was accepted and the committee discharged.

The Secretary brought up the question of application blanks not being properly filled out and signed by applicant. It was decided to accept same, as applicant's intentions were all right.

Adjourned for lunch at 12 M., to meet at 1.30 P. M.

AFTERNOON SESSION.

Meeting called to order at 1.30 by President Shipley.

The Board of Censors being absent, the President appointed W. R. Fullerton, F. H. P. Edwards and G. M. Walrod. The Secretary read communications from several members, the three following being of special importance: Dr. John R. Mohler relating to Nocard Monument, laid over until to-morrow; from W. B. Niles relative to Dr. T. A. Geddes' reinstatement and his being placed on the list of honorary members. It was moved that Dr. Geddes be reinstated and that he be placed on the list of honorary members as long as he is out of the State. Carried. From Dr. J. J. Repp:

PHILADELPHIA, 5249 ADDISON ST., Jan. 24, 1904.

Iowa State Veterinary Medical Association, in Session Des Moines, Iowa.

GENTLEMEN:—Although it is impracticable for me to meet with you in your annual convention, I shall be thinking of you and hoping that you will have a better meeting than ever before. Also, I shall recall the pleasure and profit I have had in attending the meetings of the Iowa Association in past years, and feel that I am missing a feast of good things in not being present this year. There will always be a warm place in my memory for the Iowa State Veterinary Medical Association. I have always had an intense concern for its welfare and have never knowingly let pass an opportunity to further its interests.

In my official work in Iowa I have constantly labored in behalf of the veterinary profession, and, although my zeal in this direction may have in a measure resulted in what may appear to some to be detrimental to me personally, I have no regrets, and hope the day may never come when I shall forsake the interests of the veterinary profession at the behest of those who would, if possible, destroy the business of the veterinarian. With best wishes, I remain,

Yours sincerely, JOHN J. REPP.

Moved, that Secretary write Dr. Repp expressing regrets about his leaving the State, and convey to him the best wishes of the Association. Carried.

The Committee on Sanitation reported as follows:

REPORT OF THE COMMITTEE ON SANITATION.

"This report has been left almost entirely in the hands of the Chairman, as there is so little of interest to bring before you at this time.

"In summing up the work along the lines of sanitary science in this State during the past year, I can only report little progress. The most vital questions have been dealt with in previous reports and the good suggestions and recommendations embodied therein have not been acted upon. The reasons for this are apparent. So diversified are the interests of our people that frequently what is for the welfare of some, is, at least, a financial detriment to others. Some of the problems with which we have to deal are of such a character that we can scarcely hope for unity of action in the adoption of better sanitary measures until the public see its dangers as we see them. A little reflection will help us to understand why it is the people are so slow in coming to our view point and so unwilling to accept measures which will benefit almost everyone concerned.

"We see the necessity of certain sanitary measures as a result of special study of disease and our frequent contact with the terrible pathological changes. The great mass of our people make no study of them, only occasionally see them and seldom, if ever, behold the changes that take place within the body.

"Another obstacle to the progress of our work, and especially is this true with reference to tuberculosis, is the long incubative stage, or the time elapsing between the reception of the specific agent into the system and the full development of the disease, thus making it difficult to trace with accuracy the source of infection. This, together with Koch's denial of the transmissibility of bovine tuberculosis to the human family, has led many people to believe that it is not necessary to have municipal milk and dairy inspectors. The few well authenticated cases of accidental infection is not sufficient to convince the skeptical public. As there are not willing subjects for experiment to be found we must look for further proof of undeniable accidental infection.

"That dairy cows have tuberculosis, we are certain, and that there are many cases of human tuberculosis, the origin of which cannot be accounted for in any other way except through a contaminated milk supply, seems to me sufficient evidence that this source of possible infection should be guarded against. Even grant it that the danger of infection is not so great as some of us believe, who wants to run any risk in the matter, or consume the milk or meat of any animal that is suffering from any disease? We pay for what we get and we have a right to demand that it come from a healthy animal and that it is pure and wholesome. Milk is an article of commerce and the public de-

mand that it shall contain a certain percentage of fat, and if there is any water or preservatives added the offender is promptly sought for and punished. But the same man can sell all the milk he wishes from as many old cows as he may have, no matter to what extent diseased, and nobody objects. The danger from watered milk and preservatives is not to be compared with those where the animal is suffering from constitutional diseases, and especially tuberculosis. Every year we are taxed for this inspection and we have a right to demand that it be thorough, that it begin with the animal, the fountain of our supply. Our dairy commissioners have done splendid service in securing such legislation as enables them and their co-laborers to punish all those found to adulterate the milk they put on the market, but his jurisdiction stops here and the supplementing and completion of this work and the necessary legislation will depend largely upon our unanimous efforts. While the good work done by previous committees and the other members of this Association has not born much fruit in this particular, yet the 'grafts made upon the old tree of knowledge have not been entirely barren.'

"Almost all of the dairies supplying milk to some of our towns and cities, some private and some furnishing milk for our State institutions, have been examined and submitted to the tuberculine test. The results of this work proved beyond doubt its necessity and wisdom, as 25 per cent. of some of the herds were found suffering from tuberculosis, besides the occasional presence of other diseases of a less dangerous character. Had the law required these dairymen to have every animal inspected before being admitted into their herds, a permanent good would have been accomplished.

"Could the majority of the people have had the experience that some of us have had in dealing with this disease, we would have no trouble in securing the adoption of the sanitary measures so long advocated by this Association.

"This State employs a number of men to inspect the kerosene we use in our lamps to prevent impurities which occasionally result in explosions, while these numerous fountains of disease, which are ten-fold more dangerous to the health and welfare of the public, are allowed to go uninspected.

"Glanders like tuberculosis is a communicable disease, and yet there is little trouble in enforcing the sanitary measures that have proven so effectual in controlling this disease. Had there been the same indifference and carelessness in dealing with

it as there has been with bovine tuberculosis, our States would have been overrun with the disease. Better methods are also followed in controlling and eradicating scabies than tuberculosis, though not a communicable disease, and in no way affects the welfare of our people, except financially.

"In this report I have tried to impress upon you the necessity of inspection of dairy cows, as the health of our people is more in peril from this source than possibly any other, and I hope there may be no indifference on the part of any member of this Association from this time forward.

"Respectfully submitted,

"J. MILLER,
"W. B. NILES,
"G. L. BUFFINGTON, } Committee."

The report was fully discussed by J. Miller, C. E. Stewart, P. O. Koto, W. H. Austen, P. Malcolm, C. W. Stevens, A. S. Brodies, S. H. Bauman, G. M. Walrod, J. W. Haxby, T. A. Shipley.

The Board of Censors reported favorably upon the following applications for membership: J. W. Bunker, Winterset; Thos. D. Hulme, Commerce; Carl Olson, Sac City; Rudolph Snyder, Dubuque; A. Kaderbek, Ft. Dodge; J. J. Richardson, Marcus; O. W. Rowe, Keokuk; M. Jacob, Ames; John V. Jewell, Le Mars; R. M. Allen, Marshalltown.

The report of the Board of Censors was received by vote. Moved that the rules be suspended and that the Secretary be instructed to cast the ballot of the Association for those whose names were read. This was done and they were declared duly elected.

The Board of Censors reported favorably upon the following for reinstatement to active membership: A. H. McKellar, Waterloo; Henry Shipley, Sheldon; W. B. Lincoln, Nashville, Tenn.; S. B. Nelson, Pullman, Wash.; and J. H. Spence, Clinton. The report of the Board of Censors was received by vote. On motion the rules were suspended and the Secretary instructed to cast the ballot of the Association for those whose names were read. This was done and they were declared duly reinstated.

REPORT OF COMMITTEE ON DISEASES AND TREATMENT, WITH SPECIAL REFERENCE TO AZOTURIA.

"Your Committee on Diseases and Treatment, instructed to make special reference to azoturia, begs to submit the following report:

"It is evident from a survey of the current literature for the past year that azoturia, its etiology and treatment, is still receiving considerable thought from veterinary practitioners. We are unable to report the results of any research which has thrown new light on the subject. Instead much of the evidence presented during the past year has been of a contradictory nature. This report will, of necessity, be confined to a consideration of the disease as it is regarded to-day, and a brief discussion of the most recent methods of treatment. The theories regarding the nature of this disease are extremely varied. It may be well to review them briefly here:

"In England it is regarded by one as hysteria; while Williams regards it as uræmic poisoning. In France and Southern England it is believed to be a spinal myelitis. In Germany Dieckerhoff defines it as an acute general disease of horses manifested by severe parenchymatous inflammation of the skeletal muscles, with a bloody infiltration of the marrow of the bone, especially of the femur, with acute nephritis and hæmoglobinuria, due to exposure to the cold. Friedberger and Fröhner believe it to be rheumatic in most cases, associated with an excess of lactic acid, and usually due to exposure to cold, which exposure creates extreme sensitiveness of the cutaneous nerves. By other Germans it is termed myelo-renal congestion and rheumatic lumbago. The theory of a stable miasm has been advanced by some writers. Law believes that the causative factor must be sought in some source from which it may be supplied promptly under stimulus of severe exertion. He is inclined to regard the portal system as such a source. Since the normal liver is so extremely vascular, the torpid, congested liver of the plethoric horse, after a short period of idleness, must contain an excessive amount of the surplus products of assimilation. The spleen, which has been termed the safety valve of the portal veins, is in a like condition. This leaves the portal veins and capillaries overcharged with blood rich in protein. Active exertion calling forth accelerated breathing and circulation causes this entire mass of blood to be thrown in the general circulation. This induces a plethoric condition with an excess of both globules and albuminoids. The presence of the hæmoglobinuria is explained by the presence of various solvents of the hæmoglobin, which may be derived from fodders.

"The latest research of Ligniéres would indicate the disease to be bacterial in its origin. He has found the subarachnoid fluid at the level of the bulb to contain streptococci. Cultures

from this source possessed the usual cultural characters of streptococci, and two or three drops inoculated intra-peritoneally produced a highly acute parenchymatous nephritis with bloody urine. There was additional loss of control of the hind limbs and extreme nervous irritability. Intravenous injections of 300 c.c. of culture in a large stallion produced hyperthermia, 102° the second day, 104° the third day, 105° the fourth day, paraphlegic the sixth, and death the seventh. A second horse was inoculated with 150 c.c., showed illness for several days but no paraphlegia, then apparently recovered, but became paraphlegic with albuminous urine after three weeks, and finally died. The bloody urine was not marked in either case.

"It is suggested that streptococci may be only one essential condition in the causation of the disease. Its presence may also contribute a predisposition to subsequent attacks.

"Some of the methods of treatment advocated for azoturia might be regarded as empirical in that they are based on no known knowledge of its pathology. The therapeutic agent which has been perhaps most commonly employed of any of those recently advocated is potassium iodide. Reports for the past year concerning this treatment would indicate that it merits some consideration. This method is based on Ligniéres' theory of the etiology and pathology of azoturia. And it is interesting to know that Dr. W. A. McClanahan, of Redding, Iowa, conceived the notion that if Ligniéres' theory of the cause was sound, potassium iodide should be of some service in the treatment of the disease.

"The methods of administering were injections into the bladder in doses of one-half ounce in one-half pint of water, repeated if necessary. The drug is also given per orem in usual doses. This treatment is followed quite extensively by practitioners in the Eastern States, and with favorable results. The discrepancy sometimes noted is difficult to explain. In some hands the results are uniformly good, improvement being observed within a short time, recovery in some cases in from three to six days. A second method of treatment advocated by Dieckerhoff is the administration of bicarbonate of soda, in large doses often repeated. This is a simple method and perhaps efficient in some hands. Recently the intravenous injections of normal salt solution alone or in conjunction with other treatment has been reported as giving good results. This line of treatment is in keeping with the most generally accepted theories of the cause of the disease, and may exert its favorable ac-

tion as diluent to the plethoric blood, and it may be preferable to the common practice of bleeding to that end.

"This consideration of azoturia suggests that disease of cattle, which in some of its features bears a close analogy to azoturia, namely parturient paralysis. In the treatment of this disease much progress has been reported in the year just passed. We refer to the air or oxygen treatment. This is claimed by some enthusiasts to be as much of an advance over potassium iodide as *it* was over the former methods of catharsis or drenching. It is interesting to follow the evolution of this form of therapy. In a German publication in 1902, Schmidt reports an experiment on the injection of substitutes of K. I. into the udder, such as warm water, sodium iodide, potassium bromide, etc. But he finally concludes that the use of air in connection with the original treatment hastens recovery in almost all cases. Hence it is believed that the most important modification of the potassium iodide treatment thus far proposed is the use of sterilized air or oxygen. In addition to giving more uniform results, it is claimed that cows recover the normal flow of milk in much shorter time than with potassium iodide infusion.

"This announcement by Schmidt was confirmed by Nevermann, who recommended the injection of air into the udder after the infusion of potassium iodide. Teetz, another German, offers the theory that, since he believes parturient paralysis is due to the excessive anæmia of the brain occasioned by excessive flow of blood from other parts of the body to the udder at the beginning of the period of lactation, the injection of air and the infusion of the iodide may effect a forcing out of some of the blood from the udder, thus relieving to a certain extent the cerebral anæmia. In 1903, M. Emile Thierry contributed an article to the *Journal of Practical Agriculture*, of Paris, on the treatment of parturient paralysis, which had been observed and successfully practiced by M. Knusel, of Lucerne. This treatment consisted of the injection of pure oxygen into the udder. From six to ten litres of oxygen were injected, the gas being compressed to twenty-five atmospheres in a special apparatus prepared by Hauptner, of Berlin. The teat was washed and disinfected, the teat-tube introduced and oxygen slowly released. After two quarters were thus filled the teats were compressed and the udder massaged, to thoroughly distribute the gas throughout the granulated tissues. The same operation was repeated on the other two quarters. The author's theory of the oxygen is that the toxins produced in the udder and passed into

the udder circulation are produced by anærobic bacteria, whose action is prevented by the presence of oxygen.

"Doctors Tennet and H. Barnes, of London, Ont., have practiced this method for nearly a year and report 95 per cent. of cures. The treatment has been adopted by other practitioners in this country, and so far as we can learn the results have been uniformly good. The apparatus required by the different practitioners varies all the way from a goose quill to intricate systems of tanks and valves. In this method of administering air, it seems to be the practice not to milk the udder out, but only relieve the tension occasionally. This bears out the theory advanced by Dr. Wheeler, of Biltmore, N. C., that parturient paralysis may be prevented by drawing off small quantities, two or three pounds of milk at frequent intervals, every six hours, for the first three days after calving.

"The work of Ligniéres with pasteurelloses is deserving much attention at this time, although still preliminary. He has grouped under the name pasteurelloses all those infectious diseases formerly included in the hæmorrhagic septicæmia group. This name is preferred as being based on their bacteriological identity, while hæmorrhagic septicæmia implies an anatomical character which is not constant. One of the points which these diseases have in common is that a previous non-fatal attack confers immunity. This fact suggested to Ligniéres the production of a polyvalent vaccine against all pasteurelloses. For this purpose he employed bouillon cultures, containing six different pasteurellas, maintained at a temperature of 42 to 43° C. for attenuation. Those subjected to this heat for five days constituted the first vaccine; those for only two days the second vaccine. This vaccine was inoculated under the skin in doses of from one-eighth to one c.c., according to the species and weight of the animal, with an interval of twelve to fifteen days between the first and second. It was also found that hyperimmunized animals against any one of the pasteurellas furnished an active serum against it. Ligniéres found that this principle existed for all pasteurellas and that an anti-pasteurellic serum possessed a preventive and curative action against all pasteurellas. This action was most marked toward that pasteurella used in the production of the serum, and this fact demonstrates the close relationship between all pasteurellas. On this basis the polyvalent serum was prepared, the immunization being produced by the vaccine above referred to. The common veterinary pasteurellas for which these polyvalent vaccines

and serums have been produced are a lombriz (A) in sheep, white scours of calves, typhoid affections and infectious pneumonia of horses, and swine plague.

"The announcement of the results of Ligniéres' investigations carries with it considerable weight, and may determine a new epoch in the treatment of these diseases.

"More notable research carried on during the past year is that of Pearson and Gilliland, upon the immunization of cattle against tuberculosis. From the experiments thus far conducted it is concluded that by means of intravenous injections of human tubercle bacilli the resistance of young cattle to virulent bacilli of bovine origin may be greatly increased. Even to the extent that the animals are not infected by an inoculation capable of causing death or at least extensive infection in cattle not thus protected. Intravenous injections of much larger quantities of human tubercle bacilli may be safely given. These authorities still have experiments in progress for the purpose of determining the duration of immunity thus produced and the effectiveness of this method of treatment in protecting animals against natural infection.

"In the line of treatment we find several new therapeutic agents, the merits of which are not as yet determined, though they have been quite extensively used.

"*Echinacea.*—This is an indigenous plant to the Western States, the root of which has been used to some extent in human medicine for the past quarter of a century. Dr. P. A. Fish, of the New York State Veterinary College, after experimenting with the therapeutic action of this drug, concludes that it is a valuable agent for the removal of morbid material from the system; that it exerts a beneficial effect upon the nutrition of the system, presumably through its eliminating action upon the waste material, thus causing a demand upon the part of the tissues for a new and better nourishment as evidenced by a stimulated appetite. Its action may in some respects resemble that of the alternative in that it seems to stimulate and improve the body fluids, probably through capillary and lymphatic circulations. While in some cases the effects may be reasonably prompt, in others the changes may be gradual and a long course of treatment be required. It has been used by some Eastern veterinarians in cases of colic, general inanition, strangles, fistulous withers, catarrhal fever, influenza and purpura hæmorrhagica. The success in the use of the drug so far would indicate that it may be a valuable addition to veterinary therapeutics.

"*Tallianine.*—Another agent recently introduced into this country and extensively advertised, is Tallianine, introduced into veterinary therapeutics by the French veterinarians Piccard and Cotty. Its most characteristic action is claimed to be the physiological property of rapidly increasing the number of the leucocytes in the circulating blood. There even seems to exist a certain ratio between the amount of Tallianine injected and the degree of hyperleucocytosis induced. This increase was found to be chiefly in polynuclear-leucocytes. The rapidity with which this action is brought about is more rapid in small experimental animals than in equine or bovine. This agent has a special significance since the theory has been advanced that the fibrin ferment contained in the blood is proportional to the number of leucocytes present. Tallianine is now used with reported good results in cases of purpura hæmorrhagica and other ailments in which its physiological action might be availed of to advantage.

"The past year has furnished considerable data concerning the importance of silver salts. In veterinary therapeutics those most commonly used, aside from the nitrate, are collargol, protargol, the citrate of silver, known as itrol, and the lactate, known as actol. The first of these has been used with success in cases of purpura, typhus, diarrhœa in calves, broncho-pneumonia, distemper and suppurations. The last-named preparations have been found to be efficient germicides, useful in the treatment of articular wounds, fistula, canker, and diseases of the feet, as well as all suppurative conditions. Several other silver salts are mentioned, but those named have been most extensively employed.

"In speaking of the employment of air in veterinary therapeutics, it is interesting to note the experiments of Moore, in the use of air and oxygen in checking the course of tuberculosis in tuberculin-reacting cattle. These experiments, while only preliminary, demonstrated the fact that cattle subjected to inflations of the thoracic and abdominal cavites with air or oxygen finally failed to react to subsequent tests, although found to be still suffering from generalized tuberculosis, upon post-mortem examination. This suggested the possibility of resolution taking place under such circumstances and adds more evidence to the importance of air as a therapeutic agent.

"Compressed air has also been advanced for the treatment of ulcers, fistulæ, and other chronic suppurations.

"Another therapeutic agent which appears to be coming

more into favor is the intra-tracheal injection of various antiseptics in cases of pulmonary infection. A French veterinarian uses the following formula for disinfection of the respiratory passages for cases of infectious pneumonia in the horse:

"Eucalyptol	5	grammes.
"Guaiacol	5	"
"Menthol	5	"
"Essence of thyme	10	"
"Essence of wintergreen	10	"
"Essence of cinnamon	10	"
"Essence of turpentine	30	"
"Iodoform	10	"
"Pure sterilized olive oil	150	"

"This mixture is claimed to bring about a drying of the mucous surfaces, a cessation of the coughs and more rapid absorption of medicinal substances by the mucous membrane. It is used in doses of 20 c.c. injected into the trachea in the ordinary manner. Various serums have made their appearance on the market during the past year and the value of the serum therapy appears to be increasing (especially from those serums referred to under the pasteurelloses); there is an antistreptococcic serum prepared in the Pasteur laboratory in Stuttgart which is found effective to a certain degree. In cases of contagious coryza, and especially in morbus maculosus. A great deal of investigation along these lines is being done at the present time, and it is highly probable that within a few years serum therapy will be an important adjunct to our present method of combatting infectious diseases.

"We might note briefly in passing the reported successful treatment of anthrax with creolin, given by way of the mouth and per rectum, also the reported prompt recovery of a case of tetanus in a horse, following the administration of enormous doses of hydrocyanic acid, given with intent to kill.

"A committee report on disease and treatment before this State Association would hardly be complete without some reference being made to the present condition of affairs about the State. Veterinarian Koto has kindly furnished us with a brief statement of the diseases most prevalent in this State at the present time.

"'Jan. 21, 1904.

"'*Dr. Carl W. Gay, Ames, Iowa.*

"'DEAR DOCTOR:—Your favor of the 17th received upon my arrival home, and as my time is so fully occupied I will only

give you a brief sketch of a few of the diseases now encountered. At the present time there is no particular outbreak among domestic animals. We have perhaps had more frequent calls pertaining to verminous bronchitis than any other cause. This is no doubt due to the fact that the excessive rains of the last two seasons would have a tendency to increase parasitic troubles. We have held several post-mortems and found numerous quantities of *Strongylus micrurus*.

"'Our department has been called on in several instances to investigate outbreaks among Angora goats which has caused great losses to the owners and threatened to ruin the goat industry. This new and interesting disease has been termed "Takosis" by the Bureau of Animal Industry. It is a very progressive and fatal disease, the death loss in many instances reaching 75 per cent. The disease presents many of the symptoms usually accompanying parasitic disorders and is characterized by great emaciation and weakness with symptoms of diarrhœa and pneumonia, sometimes accompanied by a slight cough. About the first noticeable symptoms would be the drowsy and lifeless appearance of the animal, it often lying down with its head turned back on its body. As the disease progresses the animal becomes so weak it is unable to rise and finally succumbs to the disease. As for treatment prophylaxis or preventive measures are recommended. Sudden climatic changes should be avoided. The animal should be provided with good, clean shelter situated on land where there is natural drainage, give them plenty of good wholesome food and pure water.

"'Glanders has been quite prevalent throughout the State and we have had also numerous reports of tuberculosis. Trusting this will be satisfactory, I am, Yours very truly,

"'P. O. KOTO.'

"It is recommended by this Committee that the members of the Association report from time to time their success in the application of the more recent methods of treatment. In this way much valuable data could be collected and presented for discussion at the subsequent meetings.

"Respectfully submitted,

"CARL W. GAY, *Chairman.*

"W. A. HECK."

NORMAL SALINE SOLUTION IN TREATMENT OF AZOTURIA.

To save time and save going over the ground twice, it was decided to hear Dr. Clinton report on the normal saline solution

as used in azoturia, before proceeding with the discussion.

Dr. Clinton reported extemporaneously: that upon receiving a call to see a case of azoturia, he took along his attendant for a caretaker, two jugs of dist. H_2O; boiled water does not act as favorably, causes abscesses; a fountain syringe with an attachment for two hypodermic needles, always sterilized; used 11 gr. tablet in 4 oz. H_2O dist. and injected deep into the muscles, the full length of the needles. When the solution quits running insert needles at the edge of the swelling caused by the first injection and follow this up, even going upon the neck, if necessary. Gave as a rule from 12 to 16 quarts, but had given as high as 24 quarts to one horse, continued over several days, of course. Gave physics and opiates, when necessary; used catheter about four times. Most cases regained their feet in from 24 to 36 hours; the longest case was down 48 hours; was turned over every few hours. Had treated 26 cases; all but five were down, and only two died. Gave credit for good care by experienced attendant.

Abscesses occasionally followed, but came out all right after having been opened and with ordinary surgical care recovered.

Discussed by S. H. Kingery, who related sad experience with atrophy following azoturia. L. U. Shipley suggested tinct. iodine or bichloride, 1 to 250, or even 1 to 125; 1 oz. each time, repeated in ten days. P. O. Koto suggested deep firing and close together, sets up a deep seated inflammation and cures.

W. A. Heck said to leave alone; that it would fill out as quickly as when treated.

Hal C. Simpson reported that Merck & Co. put out a purified ol. turpentine, that he used in atrophies successfully.

C. E. Stewart, referring back to committee report about verminous bronchitis, reported that turpentine intra-tracheally, 4 c.c. to 10 c.c., if good sized and strong, in from 7 to 10 days and second injection and even a third if needed; splendid results and never lost but one and it was very weak.

P. O. Koto and C. W. Gay reported no successful treatment. Meeting adjourned to meet promptly at 8 o'clock P. M.

EVENING SESSION.

Meeting called to order by President Shipley at 8.15 P. M.

New Business.—Moved that a committee of five be appointed to draft a fee bill to be reported at this meeting. President Shipley appointed Hal C. Simpson, W. A. Heck, C. A.

Clinton, S. H. Bauman and C. E. Stewart. Moved that the Secretary be instructed to revise and bring up to date Constitution and By-Laws and to have 200 copies printed for distribution.

Dr. R. R. Hammond not being present, the Secretary read his two reports of cases.

Dr. J. Miller presented his paper "A New Treatment for Parturient Paresis."

Dr. T. J. Neiman presented a report of a case of "Impotence of the Stallion."

Dr. G. M. Walrod presented his paper, "Hypertrophied Spleen," discussed by several. Dr. J. H. McNeil reported a case found at the college clinic a short time ago.

Dr. P. Malcolm presented a paper on "Amputation of the Penis." Dr. F. H. P. Edwards presented two reports of cases, one of a "Stone in the Urethra," and he had the stone with him; also diseased fifth and sixth lower molars. They were both very large and he had much trouble in removing them. The patient died. Both cases were thoroughly discussed.

Motion to adjourn until 9 A. M. for the clinic.

SECOND DAY'S PROCEEDINGS.

Owing to the extreme cold weather and the roads being so rough, it was impossible for parties furnishing patients for the clinic to be present, so after waiting at Dr. H. E. Talbot's office for some time, it was finally decided to have a morning session.

Meeting called to order by President Shipley at 10.30 A. M. Dr. Austin read his paper, "Some Facts and Ways of Proving Them to Our Patrons." Dr. W. A. Stuhr read a splendid paper on "Some Facts Concerning Metabolism."

Meeting adjourned at 12.40 P. M. to convene again at 1.30 P. M.

AFTERNOON SESSION.

Dr. Kay being absent, the Secretary read his paper, which was freely discussed.

Secretary read a communication from John R. Mohler, relative to a contribution toward a monument to Nocard. The Secretary was instructed to forward $10 to Dr. Mohler as the contribution of this Association.

President called S. Stewart, who gave an interesting talk regarding the advisability of collecting statistics on different diseases. Appoint a committee, let them send out blank forms for the members to fill out and return. It was decided that the Committee on Diseases and Treatment be authorized to talk

this up and to get as many as possible of the members to coöperate, and that they be limited to necessary expenses, the committee to decide what was necessary.

The Board of Censors reported favorably on the applications for membership of the following: B. Harmon, Decorah; E. G. Piper, Ida Grove; H. A. McIntire, Maquoketa; C. E. Baxter, Oakland. The report was adopted by vote. Moved that the rules be suspended and that the Secretary be instructed to cast the vote of the Association for the parties named. Carried. The Secretary declared them duly elected to membership. Board of Censors reported favorably on the applications for reinstatement into active membership of S. S. Whitbeck, Decorah; R. Philip Thurtle, Commerce; J. O. Simcoke, Davenport. The report was adopted by vote. Moved that the rules be suspended and that the Secretary be instructed to cast the vote for the Association for the parties named. Secretary declared them duly restored to membership.

Dr. S. H. Bauman read a volunteer paper. A communication from *The Homestead* asking permission to publish some of the papers presented before the Association. It was decided that the proceedings should appear first in the REVIEW; afterwards, if *The Homestead* still wanted to publish any of the papers, the Secretary was to furnish them.

The report of the committee to draft a fee bill was read by W. A. Heck. Moved that the bill be adopted as read and that 1000 be printed for distribution.

Legislation was next discussed by P. O. Koto, H. E. Talbot, P. Malcolm, C. E. Stewart and others. Dr. Gregory, a member of the House from Adams County, addressed the Association in a nice twenty-minute talk. He thought we should have what we asked and offered his services in our interests.

Moved and carried that we tender a vote of thanks to Dr. Gregory for his talk and his promise of efforts in our behalf.

Moved by P. O. Koto that the next Committee on Legislation be empowered to draft a bill whereby ($1) one dollar annual renewal fee may be included, with such other legislation as they may deem necessary.

ELECTION OF OFFICERS.

Moved by P. O. Koto that the Association take an informal ballot for President. The President appointed W. A. Heck and W. R. Fullerton tellers. Dr. J. Miller having by far the most votes, it was moved by C. A. Clinton that the rules be suspended, and that Dr. J. Miller be unanimously elected President.

Carried. Tellers escorted Dr. Miller to the chair. President Shipley thanked the Association, introduced J. Miller and retired. President made a short talk, thanking the Association.

Moved by P. O. Koto that the rules be suspended and that we elect other officers by acclamation : C. E. Stewart was elected First Vice-President; S. K. Hazlet was elected Second Vice-President; Hal C. Simpson was elected Secretary and Treasurer.

The report of the Committee on Resolutions was read by W. E. Miller, Chairman, and adopted.

RESOLUTIONS ADOPTED.

"*Mr. President and Members :*

"Your Committee on Resolutions beg leave to report as follows :

"WHEREAS, We learn with sorrow that Dr. F. M. Roy, of Manning, Iowa, a member of this Association, has been afflicted by a partial stroke of paralysis, be it therefore

"*Resolved*, That we extend to himself and family our sincere sympathy in the affliction which has befallen him, and heartily hope for his speedy recovery.

"WHEREAS, The matter of good roads has become a national question, and as the Department of Agriculture and the President, in his message, recommends the building of good roads, and in his address delivered before the National Good Roads Convention at St. Louis last April heartily and earnestly commends this movement, be it therefore

"*Resolved*, That we are heartily in favor of the movement for the improvement of the public roads, and that we endorse the Brownlow bill (House Records No. 4508. Senate Record No. 2539) and that we forward a copy of this resolution to our Senators and Representatives, asking their support of this bill.

"WHEREAS, In the removal of Dr. John J. Repp from our State we have lost a faithful and conscientious worker for the advancement of the profession, be it therefore

"*Resolved*, That we extend to our former Secretary, Dr. John J. Repp, our hearty good will, an expression of our high appreciation of his ability and generous efforts in behalf of our Association and our best wishes for his success and the happiness of himself and family in their new home.

"WHEREAS, It has been the experience of all graduate veterinarians that a thorough course in a recognized veterinary school is necessary before a man is competent to treat domestic animals successfully, and

"WHEREAS, That we, the Iowa State Veterinary Medical Association, learn that a correspondence school is being conducted in this State,

"*Resolved*, That we express our strong disapproval of the instruction of non-graduates in any other than the regular undergraduate course in a recognized veterinary college.

"*Resolved*, That we extend our thanks to Dr. H. E. Talbot for his able efforts in contributing to our entertainment; also to the Capital Lodge, No. 106, I. O. O. F., for placing their lodge rooms at our disposal.

S. H. BAUMAN,
"F. F. PARKER,
"W. E. MILLER."

The Secretary was allowed $20 for editing and typewriting the proceedings. Secretary was allowed $5 to pay for use of hall.

The report of the Judiciary Committee was read and adopted as read.

REPORT OF JUDICIARY COMMITTEE.

"We, the Judiciary Committee of the I. S. V. M. A., after a careful inquiry, find that Dr. A. T. Peters, of Lincoln, Neb., an honorary member of this Association, has been guilty of non-professional conduct in that he has become a teacher in a correspondence school of veterinary science for the express purpose of teaching veterinary science to farmers, breeders and non-graduate veterinary practitioners. We therefore recommend that he be expelled from membership in the Iowa State Veterinary Medical Association.

T. A. SHIPLEY,
"HAL. C. SIMPSON,
"W. H. AUSTIN,
"H. L. STEWART,
"L. U. SHIPLEY."

Meeting adjourned, subject to call of President.

SCHEDULE OF FEES.

General Practice.

Visits in city or town: $1.00 to $2.00.

Mileage in county: $1.00 first mile and 50 cents per mile for each additional mile.

Mileage on railroad:

Prescribing for each additional patient at same visit, 50 cts. each.

Night calls: Extra fee.

Remaining in attendance all night: $10.00.

Detention in addition to visit, per hour $1.00 to $2.00.
All day service: $10.00 and expenses, and upwards.

Surgical Practice.

Ordinary visits, same as general practice; dressings and medicines extra.
Minor operations: $1.00 and upwards.
Major operations: $5.00 and upwards.
Suturing and dressing wounds: $1.00 and upwards.
Neurectomy: $5.00 (and upwards) to $25.00.
Removal scirrhous cord: $5.00 and upwards.
Amputation of penis: $10.00 and upwards.
Tracheotomy: $5.00 and upwards.
Use of actual cautery: $5.00 to $25.00.
Setting of fractured limbs: $2.00 and upwards.
Castration, straight colts: $1.00 to $5.00.
Castration, cryptorchids: $10.00 and upwards.
Vaccination, black-leg: 35 cents and upwards.
Ovariotomy, mare: $25.00.
Ovariotomy, cows: 50 cents, in bunches.
Ovariotomy, bitches: $2.00 to $5.00.

Obstetrical Practice.

Delivery of fœtus, normal distokia, mare: $5.00 to $25.00.
Delivery of fœtus, normal distokia, cow: $5.00 to $15.00.
Cæsarian operation: $2.00 to $25.00.
Removal of placenta, mare: $5.00 to $10.00.
Removal of placenta, cow: $3.00 to $10.00.
Replacing uterus, mare: $10.00 and upwards.
Replacing uterus, cow: $5.00 and upwards.

Dentistry.

Dressing molar teeth: $1.00 to $2.00.
Cutting elongated molars: $2.00 to $3.00.
Cutting elongated incisors: $2.00 to $5.00.
Extracting wolf teeth: 50 cents per tooth.
Extracting temporary incisors: 50 cents per tooth.
Extracting molars: $3.00 to $5.00.
Trephining sinus for removal of molar teeth: $5.00 and upwards.

Consultations: $5.00 to $10.00 and mileage.
Examination of horses for soundness: $2.00 to $10.00.
Post-mortem examination: $5.00 to $25.00.
Chemical and microscopical examination of urine and milk: $5.00 and upwards.

Chemical analysis of poisons: $5.00 and upwards.
Professional certificates: $2.00 and upwards.

Office Practice.

Advice: $1.00.
Advice by letter or telephone: $1.00.

THE ATTENDANCE.

Those in attendance during the meeting were as follows, as determined by the registration cards:

Members.—W. E. Miller, Cherokee; S. Stewart, Kansas City, Mo. (Honorary); M. H. Reynolds, St. Anthony Park, Minn. (Honorary); W. H. Austen, Newton; H. A. McIntire, Maquoketa; B. Harmon, Decorah; Wm. Hamilton, Boone; W. A. Heck, West Liberty; S. S. Whitbeck, Decorah; Anton Kaderbek, Ft. Dodge; M. Jacob, Ames; J. R. Sanders, Corydon; W. A. Stuhr, Ames; P. Malcolm, New Hampton; Carl W. Gay, Ames; O. W. Rowe, Keokuk; C. W. Stevens, Knoxville; L. U. Shipley, Sheldon; G. M. Walrod, Storm Lake; J. W. Bunker, Winterset; A. S. Brodie, Cedar Falls; F. J. Neiman, Marshalltown; Carl Olson, Sac City, F. H. P. Edwards, Iowa City; F. F. Parker, Oskaloosa; J. Miller, Ottumwa; H. C. Simpson, Denison; F. H. Thompson, Des Moines; A. F. Baldwin, Creston; C. E. Stewart, Chariton; S. H. Kingery, Creston; H. E. Talbot, Des Moines; C. A. Clinton, Laurens; C. J. Hinkley, Odebolt; J. H. Spence, Clinton; W. R. Fullerton, Dubuque; P. O. Koto, Forest City; J. W. Haxby, Villisca; H. L. Stewart, Lacona; R. P. Thurtle, Campbell; S. K. Hazlet, Oelwein; J. J. Richardson, Marcus; C. A. Ashworth, Ashawa; S. A. Bauman, Birmingham; T. A Shipley, Cedar Rapids.—(45.)

Visitors.—Mr. Gilbert (Member Legislature), Creston; H. G. Moore, Chicago, Ill.; S. H. Ward, St. Paul, Minn.; R. Mollance, Reinbeck; Albert Stigors, Stuart; J. H. White, Ames; Foster Pierce, Ames; W. V. Glaisyer, Ames; R. J. Moreno, Ames; J. W. Edwards, Stuart.—(10.)

HAL C. SIMPSON, *Secretary.*

[NOTE.—All the papers and reports of cases presented at this meeting are in the hands of the REVIEW, and will be published as rapidly as possible.—EDITOR.]

MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION.

The twenty-second meeting of this Association was opened in due form at 2.30 P. M., by President H. M. Gohn, of St.

Johns, in the parlor of the Hotel Downey, Lansing, Michigan. Roll-call showed the following members present: Drs. J. Black, Geo. W. Dunphy, W. J. Byers, D. Cumming, Wm. Jopling, Geo. C. Moody, A. McKercher, H. F. Palmer, J. C. Whitney, Geo. Waddle, John Russel, J. W. Brodie, H. S. Smith, Robertson Muir, H. H. Clement, Hal L. Balenger, W. W. Munger, H. Wynn Nobles, Jas. S. Donald, T. G. Duff, H. M. Gohn, Jas. Harrison, W. S. Hamilton, J. J. Joy, R. W. McDonald, D. G. Sutherland, J. E. Ward, J. J. Walkington, F. C. Wells, C. A. Waldron, W. N. Armstrong, Thos. Farmer, Charles C. Slaght. Visitors present: Drs. J. B. Stevens, Yale; C. C. Stevens, Byron; R. F. Erwin, Alma; S. M. Mizer, Leslie; C. H. Adams, Carson City; Henry M. Armour, Litchfield; N. B. Allen, Sault Ste. Marie; C. C. Petty, Lake Odessa.

Minutes of meeting of February, 1903, were read and approved as read.

The President then addressed the meeting. He said he was pleased to say that our membership was steadily increasing, but there were perhaps not more than one-half eligible in the State who are members of this Association, and urged everyone to make an effort to increase our membership. The efforts of our Legislative Committee were fruitless during the last year, and he recommended that the matter be further left in their hands. In speaking of outbreaks of hog cholera in different parts of the State, he advised the veterinarians to send specimens to the Bacteriologist at the Agricultural College, Prof. Marshall, who was always ready to examine them. We as veterinarians could do much towards securing a better knowledge of contagious diseases of live-stock of the State by sending specimens to the M. A. C. for examination. He urged all that could do so to join the A. V. M. A.

After the President's address applications for membership were presented by the following gentlemen: Drs. C. C. Stevens, Byron, age 24, graduate O. V. C., '02; C. H. Adams, Carson City, age 37, O. V. C., '93; W. L. Brenton, Detroit, age 20, O. V. C., '03; Henry M. Armour, Litchfield, age 28, O. V. C., '02; R. F. Irwin, Alma, age 28, O. V. C., '00; Thomas W. McConnell, Moline, age 35, O. V. C., '92; S. M. Mizer, Leslie, age 26, O. V. C., '01; D. B. Allen, Sault Ste Marie, age 30, O. V. C., '98; C. C. Petty, Lake Odessa, age 31, O. V. C., '02. All were accompanied by the required fee. The applications were referred to the Executive Committee. Dr. J. B. Stevens, of Yale, applied for reinstatement. This application was referred to the

same committee. After a session of the above committee they recommended the admission of all the above applicants, Dr. J. B. Stevens to pay up all dues accumulating prior to his suspension. Upon motion, the Secretary was instructed to cast the vote of the Association for the above applicants, which was done. They were therefore declared elected to membership by the President.

The Secretary-Treasurer's report showed an unpaid balance of $29.45 at the close of the year's business. His report was accepted and referred to the Committee on Finance, who reported it O. K.

Correspondence was read from absent members and others, which was accepted and placed on file.

Dr. W. B. Austin and Dr. Chas. Manning, members of this Association, were reported deceased since our last meeting. Dr. Austin's widow sent a list of veterinary instruments, which the Secretary asked the members to assist her to sell.

Moved and supported that the President appoint a Committee on Resolutions. Carried. Drs. Sutherland, Muir and Hawkins were appointed as such committee.

Dr. Jopling, chairman of the Committee on Intelligence and Education, gave a comprehensive report,* which was listened to with much attention. The doctor's report showed much time and care was spent in its preparation. It was discussed by Dr. Palmer and others. Dr. Muir in discussing it advised that those requiring diplomas from American institutions should be required to pass an examination before a council appointed by the Government. Dr. Hawkins said that in all probability the O. V. C. will have no more two-year terms.

Adjourned at 5.30 to re-convene at 7.30.

Dr. F. C. Wells, chairman of Committee on Legislation, made a report of its doings the past year. He attributed the defeat of our practice bill to the bull-headedness of some of the legislators and to the attitude of *The Michigan Farmer*, which opposed the bill. The Legislature as a whole were favorable, but our defeat showed what a few stubborn individuals could accomplish. The bill passed the Committee on State Affairs in good form, but the House was inclined to mutilate it so badly that it was thought best not to push it. It was therefore withdrawn. The sanitary bill was defeated by the Live-Stock Sanitary Commission, who saw in its passage the loss of their jobs.

* Will be published in an early number of the REVIEW.

Dr. J. B. Stevens, discussing the report, suggested that owing to the ignorance of the farmer of the present sanitary law, it would be well for each and every one of us to point out to them while in contact with them throughout the year, the drawbacks and uselessness of the present law and point out where it gives them the worst of it. Drs. Harrison, Gohn and others thought it well to educate the farmers regarding the situation through their clubs, grange and institutes, by sending copies of the proposed bill to them.

Dr. H. F. Palmer presented a very excellent report of the Committee on Diseases, prepared by the Secretary of the committee, Prof. Marshall, of the M. A. C. They spoke of the symptoms accompanying hog cholera, of sore feet and mouth. Dr. Wells also saw these symptoms. In response to letters sent out by the secretary of the committee, the following diseases were reported in the State by different veterinarians throughout the commonwealth. Dr. Jas. Harrison, Maple Rapids, reported azoturia, and in cattle parturient paresis, as the diseases most prevalent in his locality. He also reported hog cholera. Dr. H. M. Gohn, St. Johns, reported hog cholera and lump jaw. Dr. W. R. Murtry, Jonesville, contagious ophthalmia in cattle, introduced in the locality by stock steers from the West, purchased at the Chicago Stock Yards. Dr. H. S. Smith, Albion, six cases of cerebro-spinal meningitis in horses, and rabies in 23 hogs, 6 cattle, 1 horse and 2 dogs. Dr. J. Black, Richmond, reported two cases of cerebro-spinal fever in cows.

Dr. H. F. Palmer read a paper, "The Veterinarian in the West," * by Z. Veldhuis, a meat inspector of Kansas City, Mo., (a member of our Association), which was very interesting. In discussing it Dr. Hawkins asked if any of the doctors present had seen any scab in cattle. Dr. Palmer had seen it, and said "kreso" was a sure cure for it.

Dr. C. A. Waldron read a paper on "So-called Pinkeye in Cattle," * which brought out a spirited discussion, the result of which would make it apparent that there is more than one contagious eye disease among cattle in Michigan. Dr. Wells, State Veterinarian, stated that he agreed with Dr. Waldron that the disease was brought in by Western cattle. He reported a case in which seven head died from the disease in one herd. Dr. Hawkins reported seeing an extensive outbreak just across the river from Detroit, and stated that its coming from the West

* Will be published in an early number of the REVIEW.

was out of the question in this case; no deaths. Dr. Stevens reported cases in his neighborhood that were not treated and permanent blindness resulted in many instances. Dr. Adams reported 65 cases in a herd, with one death and no blindness. These cases were all treated scientifically. He claimed that the disease was introduced into the herd by a Western steer. Dr. Waldron thought that some of the cases reported may have been malignant catarrh.

Moved and supported that the President appoint some member to consult with the Secretary of State and find out what steps will be necessary to change the Articles of Incorporation so as to make it possible to leave the selection of the place of the annual meeting to the Executive Committee. Carried. The President appointed Dr. Wells as such delegate.

Adjournment until 9 o'clock A. M., Feb. 3d.

Feb. 3.—Meeting called to order at 9 A. M. Dr. Jopling when called upon for his paper excused himself, saying he had not prepared it on account of sickness.

Dr. H. M. Gohn read a paper upon "Some Foreign Bodies in the Stomachs of Cattle."* He exhibited a rib of an umbrella 25 inches long which had been swallowed by a cow and which was removed by the doctor from the side, where the end of it was felt under the skin. A photograph of the cow was exhibited showing the point from which the steel rib was removed on the left side from the next to the last intercostal space. Dr. Duff, discussing Dr. Gohn's paper, said a case occurred in his practice that, following an effort by the owner to pass a broomstick (in a case of choke), broke about 13 inches off the stick, which was swallowed, and was found in the rumen in a harmless condition on post-mortem, two years afterward. Dr. Dunphy spoke of a case he had showing symptoms of tubercular trouble, very emaciated, cough, etc., which was killed and post-mortem held, which revealed a large abscess in the lungs, caused by a split cut-nail, a part of which was embedded in the wall of one of the cardiac ventricles.

Dr. Dunphy gave a very interesting and instructive lecture on the "Contagious Diseases of the Hog." He spoke of hog cholera, swine plague, tuberculosis and diseases of a like nature, some diseases which were confined to one farm and which he thought were due to diet and were not contagious.

Dr. Palmer, who has been conducting experiments with hog

* Will be published in an early number of the REVIEW.

cholera vaccine during the past year, also gave a very interesting talk on this subject.

Dr. Henry B. Baker, Secretary of State Board of Health, gave a pleasant talk. He spoke of the ravages of rabies and tuberculosis throughout the State, and the importance of the veterinary profession in the sanitary affairs of the State.

Dr. Waldron spoke of serum that he had used in hog cholera, which he thought it was his duty to mention, as it had acted in a very satisfactory manner in his hands.

Dr. Thos. Farmer read a very able paper upon "Heredity,"* which was listened to in a manner which showed appreciation of the doctor's method of handling this subject.

It was moved and supported that the regular order of business be suspended and that the election of officers be proceeded with. Carried. The President appointed Drs. Jopling and Ballenger tellers. Dr. H. F. Smith was nominated for President. Moved and supported that the present officers all be declared elected by acclamation. Carried. Moved and supported that the Secretary cast the ballot of the Association for H. M. Gohn for President for the ensuing year. Carried. The Secretary cast the ballot as directed and Dr. Dunphy declared Dr. H. M. Gohn elected. Dr. Gohn resumed the chair. This procedure was followed in the election of all the remainder of the old elective officers, who were declared elected by the President.

Dr. W. A. Giffin tendered his resignation from the Association, which was accepted. He gave as his reason for the step the fact that he was no longer in the practice of veterinary medicine, having gone into the dentistry business. He regretted that he was compelled to withdraw, but thought best to do so.

Moved by Dr. Palmer and supported by Dr. Cummins that the rules be suspended and Dr. Giffin be elected an honorary member of this Association, as he had always been a very energetic member, had always done much as Secretary to increase the membership of our Association, and had only once during his entire connection with this body been absent from a meeting, and that time he was prevented by a broken hip. Motion carried and Dr. Giffin was declared an honorary member.

Dr. Wells, who had been delegated by the President to confer with the Secretary of State as to what steps would be necessary for this Association to take to make it possible for the Executive Committee to arrange for place of annual meeting, re-

* Will be published in an early number of the REVIEW.

ported that in order to change the place of meeting a vote of the Association must authorize the officers and Board of Directors to make the change. Moved and supported that the officers of this Association be authorized to change the Articles of Association so as to leave the selection of place and time of meeting to the Executive Board. After thoroughly discussing the motion, it was put to vote and declared lost.

Committee on Resolutions presented the following, which on vote was received and adopted :

"WHEREAS, It has pleased Him who doeth all things well, to take from us our fellow-members, Dr. Charles Manning and Dr. W. B. Austin, and

"WHEREAS, These men were identified with the active work of the Michigan State Veterinary Medical Association; therefore, be it

"*Resolved*, That we, as a Society, at this, our annual meeting, express our sincere regret that those who were so young should be suddenly cut off.

"*Resolved*, That we extend to the families of the deceased members our sympathy, and hope that they may be greatly sustained in this their great trial.

"*Resolved*, That copies of this resolution be sent to the families of the deceased members and that a copy be spread upon the minutes of this meeting."

"WHEREAS, It has come to our notice that Dr. A. H. Baker, of the Chicago Veterinary College, is a factor in the publication of a book along the lines of a farmers' adviser, and

"WHEREAS, It seems an injustice to the great mass of veterinary students that a book of such nature should be put in circulation; therefore, be it

"*Resolved*, That we express our disapproval of any member of the veterinary profession embarking along the lines of lowering the grade of our veterinary literature.

"*Resolved*, That we transmit a copy of these resolutions to the Secretary of the American Veterinary Medical Association, together with a copy of the printed circular advertising the book, and

"*Resolved*, That a copy of these resolutions be spread upon the minutes of this meeting."

"WHEREAS, There are frequent violations of the law as regards registration of the veterinarian; therefore, be it

"*Resolved*, That we, as a veterinary medical association, do sanction any legitimate action that may be taken by the State

Board of Veterinary Examiners toward the prosecution and conviction of those who are not complying with the law."

"WHEREAS, Our Society has for a number of years been endeavoring to secure legislation in favor of the veterinarian, and

"WHEREAS, Hon. J. L. Morrice and Hon. James Dunn gave us great assistance in this endeavor to secure the passage of our bills at the last session of the Legislature; therefore, be it

"*Resolved*, That we, in annual meeting assembled, do offer our sincere thanks to those gentlemen for their services; and

"*Resolved*, That we transmit a copy of these resolutions to each of the gentlemen and also that a copy be spread upon our records."

"WHEREAS, The appointment for the position on the State Examining Board of Veterinary Examiners has as yet not been made;

"WHEREAS, Dr. C. A. Waldron, of Tecumseh, has given efficient service on that Board; therefore, be it

"*Resolved*, That we, as a Society, favor the appointment of Dr. C. A. Waldron on the State Board of Veterinary Examiners;

"*Resolved*, That we ask Gov. Bliss to re-appoint Dr. C. A. Waldron.

"*Resolved*, That we place in Dr. Sutherland's hands a copy of these resolutions for transmission to Gov. Bliss.

"D. G. SUTHERLAND, J. HAWKINS, R. MUIR, *Committee*."

Dr. W. S. Hamilton read a paper on "Veterinary Science,"* which was much appreciated by those who heard it. Dr. Hamilton always has something of extra worth in his papers.

Dr. James Harrison read a paper on the subject of "Complete Rupture of the Abdominal Muscles."† Dr. Hawkins in discussing the subject said that he had seen a case where a mare was ruptured so that her belly was not over eight inches from the ground, and she had five colts afterwards successfully while in that condition. A second case had a colt for each year for two years after rupture, and was then lost sight of. Dr. Sutherland told of one of his own mares that had eight colts after this accident. A second case he cited had died from internal hæmorrhage from the lesion. A third case had bred and foaled again successfully. Dr. Munger also reported a case where the mare had colts after a bad rupture. Dr. H. F. Smith reported two cases that resulted fatally. Dr. Duff reported a recovery. Dr.

* Will be published in an early number of the REVIEW.

† Published elsewhere in this number.

Slaght reported two cases of Cæsarian section in ruptured mares, the foal in one case living two weeks and dying from derangement of the digestive apparatus. In the second case the foal was raised to maturity.

Moved and supported that the Secretary send five dollars to the AMERICAN VETERINARY REVIEW for the Nocard Memorial Fund.* Carried.

Dr. H. F. Palmer volunteered to send in subscriptions to the AMERICAN VETERINARY REVIEW, saying he was not an agent nor in any way connected with that journal, but thought it was a journal that every veterinarian should read. Many others spoke in a very complimentary manner of the above periodical.

It was moved and supported that, owing to the extra work of the Secretary, that he be paid an additional ten dollars. Carried. The Secretary said that he appreciated the action very much, but could not accept the amount while we were in our present financial condition.

Officers for the ensuing year are as follows:

President—Dr. H. M. Gohn, St. Johns.

First Vice-President—Dr. Geo. W. Dunphy, Quincy.

Second Vice-President—Dr. H. S. Smith, Albion.

Third Vice-President—Dr. James Harrison, Maple Rapids.

Secretary-Treasurer—Dr. J. Black, Richmond.

Directors—Drs. J. C. Whitney, Hillsdale; Robertson Muir, Grand Rapids; D. G. Sutherland, Saginaw; Wm. Jopling, Owosso; C. A. Waldron, Tecumseh; W. H. Erwin, Howell.

The President appointed the following Committees:

Intelligence and Education.—Drs. Wm. Jopling, J. Drury, and R. W. McDonald.

Diseases.—Drs. H. F. Palmer, R. Muir, J. J. Walkington, Prof. C. E. Marshall, Secretary.

Finance.—Drs. S. Brenton, Geo. C. Moody, J. B. Stevens.

Legislation.—Drs. F. C. Wells, J. J. Joy, D. G. Sutherland, G. W. Dunphy, J. Black.

Adjourned.

J. BLACK, *Secretary.*

INDIANA STATE VETERINARY ASSOCIATION.

The thirty-second semi-annual meeting of this Association was held at the Indiana Veterinary College, Indianapolis, Ind., Jan. 6, 1904. The first session was called to order at 2 P. M. by

* Check received and forwarded to the French Committee.

the Vice-President, Dr. F. W. Anderman, and the following members responded to roll-call: F. W. Anderman, Hartford City; Wm. Axby, Harrison, Ohio; O. L. Boor, Muncie; E. M. Bronson, Indianapolis; F. A. Bolser, New Castle; James Crail, Shelbyville; W. B. Craig, Indianapolis; R. A. Craig, LaFayette; W. A. Dryden, Columbus; J. O. Greeson, Kokomo; Clarkson Gause, Carthage; J. J. Herron, Tipton; Robert F. Harper, Indianapolis; J. W. Klotz, Nobelsville; Walter Langtry, Fort Wayne; Frank Muecke, Indianapolis; Ferd. A. Mueller, Indianapolis; J. R. Mitchell, Evansville; Wm. F. Myers, Fort Wayne; E. H. Pritchard, Indianapolis; John E. Pritchard, Indianapolis; G. H. Roberts, Indianapolis; Thomas A. Siegler, Greencastle; I. E. Scripture, Frankfort; Samuel Springer, Cumberland; Claude P. Wilson, Greenfield, and about fifty visiting members of the profession.

Reports of the Treasurer and Secretary were read and adopted.

Vice-President F. W. Anderman then addressed the meeting at length on the subject of "The Many Recent Advancements Made by the Profession."

The chairmen of the different committees were then called upon to make their reports, and Dr. F. A. Bolser, as chairman of the Committee on Veterinary Legislation, gave a very interesting report on dealing with the legislative subject in this State, stating that the demand for veterinary legislation has immensely increased within the last year.

The following officers were then elected for the ensuing year:

President—F. W. Anderman.

Vice-President—W. B. Craig.

Treasurer—O. L. Boor.

Secretary—G. H. Roberts.

When the committees had made their reports and the business of a routine nature had been disposed of, the meeting adjourned and the following clinics were witnessed:

Dr. Thomas M. Hall performed peroneo-phalangeal tenotomy; oöphorectomy, by Dr. G. H. Roberts; Dr. W. B. Craig performed the operations of peroneo-tibial neurectomy, median neurectomy, and super-carpal tenotomy; Dr. A. N. Gurley, of Martinsville, trephined a case for nasal catarrh; Dr. O. L. Boor did some very nice work in caponizing.

Meeting adjourned to meet at State House at 7.30 P. M.

On reassembling, the routine business was again taken up,

and Drs. Harry E. Smock, Franklin; J. B. Archer, Spencer; H. L. Coote, Michigan City; J. L. Axby, Lawrenceburg; C. F. Collins, Bellmore; and O. C. Newgent, Russellville, were elected to membership.

A number of interesting papers by different members were read and discussed. Dr. A. N. Gurley read a paper on "Atrophy of Posteaspinatus Muscles"; Dr. O. C. Newgent, a paper on "Hæmorrhage of the Bladder in a Colt"; Dr. W. B. Craig, "The Hock"; Dr. G. H. Roberts, report on "Dislocation of the Fetlock Joint, with Recovery"; Dr. R. F. Craig, report on "Infectious Abortion"; Dr. J. R. Mitchell, report on "Fracture of Sesamoids, and Open Joint, Followed by Recovery."

Meeting adjourned to meet in September.

G. H. ROBERTS, *Secretary.*

CENTRAL CANADA VETERINARY ASSOCIATION.

This Association held its second annual meeting in St. Andrew's Hall, Ottawa, on Wednesday evening and Thursday morning, Jan. 27th and 28th.

Evening Session—Jan. 27th.—The meeting opened at 8.30 P. M., with the President, Dr. A. W. Harris, of Ottawa, in the chair. There were present: Drs. T. A. Allen, Brockville; J. J. McGregor, Carleton Place; W. C. Young, Almonte; P. J. Lynchke, Carp; A. S. Morrison, Chesterville; C. W. J. Haworth, Eganville; J. G. Rutherford, A. E. Moore, A. E. James, J. B. Hollingsworth, H. E. Marshall, W. W. Boucher and C. H. Higgins, of Ottawa; D. McAlpine, Brockville; W. D. Monk, South March; G. W. Higginson, Rockland; A. G. Young, Merrickville; T. Johnston, Peterboro; F. Fisher, Carleton Place; T. Thacker, Renfrew; and W. C. McGuire, Cornwall.

The minutes of the first annual meeting, held Feb. 5th, 1903, and of the various regular and special meetings of the Association, also the minutes of the meetings held by the Council, were read and approved.

The Constitution and By-Laws were adopted as printed with the exception of a few slight alterations.

Four new members were elected: M. Gallivan, Iroquois, Ont. (graduate of Queen's University, Kingston, 1899); Geo. W. Bell, Kingston, Ont. (graduate of Ontario Veterinary College, 1880); W. D. Monk, South March, Ont. (graduate of Ontario Veterinary College, 1887); R. H. McKinnon, Picton, Ont. (graduate of Ontario Veterinary College, 1873).

The next business in order was the President's address, in which he mentioned the origin of the Association, indicating that, starting with only twelve members, there are at the present time forty members in good standing. He praised the appointment of Dr. J. G. Rutherford as Chief Dominion Veterinarian, for with him originated the idea of having the Association, that the plans for entertainment, and the supplementing of his personal invitation to the American Veterinary Medical Association to hold its fortieth annual meeting in Ottawa, might be carried out. This meeting of the American Veterinary Medical Association was referred to as being the first held outside the United States since its organization. The fact was mentioned that the veterinary profession in Ontario was awakening and that there were evidences of increased interest in the profession, together with a desire that the standard of the only existing English-speaking veterinary college in Canada be raised, and also that legislation was already being talked of. The President urged that practicing veterinarians should assist in this effort toward legislation, stating that it was only by concerted action that it would be possible to obtain definite results.

The next business was the election of officers for the ensuing year, which resulted as follows :

Honorary President—Dr. J. G. Rutherford.

President—Dr. A. W. Harris.

Vice-President—Dr. T. A. Allen, Brockville.

Secretary-Treasurer—Dr. A. E. James.

Additional members who, with the officers, form the Council—Drs. P. J. Lynchke, Carp; T. Thacker, Renfrew; W. C. McGuire, Cornwall; Geo. W. Higginson, Rockland; F. Fisher, Carleton Place; J. B. Hollingsworth, W. W. Boucher, and C. H. Higgins, Ottawa.

Dr. C. H. Higgins was elected official reporter for the Association.

The question of holding a midsummer meeting was discussed, a cordial invitation being extended to the Association to hold this meeting in Brockville, by Dr. T. A. Allen, of that city. As a special inducement for the acceptance of his offer Dr. Allen gave a brief *resumé* of the many and varied trips by water which could be taken from Brockville and that these would furnish a pleasant outing and great relief from the dull routine of practice. This invitation was supplemented by Dr. McAlpine, also of Brockville, in a few well chosen remarks.

Dr. Rutherford was called on by the President to give a re-

port of the meeting held in Toronto on the 19th inst., which had as its object the organization of the profession in Ontario, with a view to obtaining legislation, that the profession might occupy a more enviable position than is the case at the present time. Dr. Rutherford stated that the meeting was enthusiastic and he was very hopeful of results. A circular had been issued and would in the course of a few days be received by all veterinarians in Ontario, appealing to them for their personal influence and financial assistance in the work. As one of the details of organization, county associations were to be formed, as they would be better able to reach individual practitioners in the outlying districts. He also mentioned that there was already a fund of three hundred dollars subscribed and in the hands of the Treasurer for the prosecution of this work. The subject of the affiliation of the Central Canada Veterinary Association and the various county associations with the Ontario Veterinary Medical Association was discussed, though no definite action was taken toward this end by the members of the organization committee.

Dr. Allen, also a member of the organization committee and a delegate of the Central Canada Veterinary Association, was called upon. His remarks were along the lines already outlined by Dr. Rutherford.

The following, a motion proposed by Dr. T. Thacker, of Renfrew, was endorsed by the Association: "I move that the action of our delegates be endorsed and that this Association desires to place on record its hearty approval of the movement now on foot for the organization of the veterinary surgeons in Ontario."

The financial statement rendered by the Treasurer, Dr. W. W. Boucher, indicated a balance of about sixty dollars after the payment of all outstanding bills.

Presentation of Papers.—Dr. J. B. Hollingsworth, of Ottawa, presented a paper the title of which was "Navicular Disease."* In this he technically described a portion of the anatomy of the part, that the relationship between the bones and other structures, with their functions, might be more easily understood. The symptoms and treatment of this disease were given in detail, indicating the cases which would show beneficial results from operations. A spirited discussion followed, during which there were many favorable and adverse criticisms of the treatment

* Will be published in any early number of the REVIEW.

employed by Dr. Hollingsworth. Among those taking part in this discussion were Drs. Lynchke, Fisher, Haworth, Allen, McGuire, W. C. Young, and Rutherford.

The next paper was that of Dr. A. E. Moore, on "Contagious Abortion in Cattle."* The history of the disease, a brief *resumé* of the scientific observations of various investigators, the course, symptoms and treatment were entered into minutely. The discussion, which was deferred till Thursday morning, indicated that there was scarcely a practitioner present who had not been called upon to deal with this affection. Dr. Rutherford stated that the loss to the live stock industry from this one disease alone was appalling, but from its insiduous nature and the difficulty in dealing with it rendered it impossible for governments to schedule the affection with the other contagious diseases. Almost everyone present had had experience with this affection, and the treatment recommended by the essayist, consisting in complete disinfection of the stable, the animal, and the burning of the fœtus and afterbirth, seemed to be successful.

Dr. James' paper on "Capped Elbow, or Shoe-Boil,"* detailed the history and causes of this affection. The treatment, mainly surgical, was described in full, indicating the various methods practiced by different operators. The discussion brought out many points of interest to the practicing veterinarian, and in the main substantiated the views advanced by the essayist. The treatment of bursal enlargements was also brought out by the discussion, and the methods of treatment employed by various members was given in detail. A very ingenious device, consisting of a curved clamp to take in the part, with a hinge and screw, was described by Dr. Rutherford as being the instrument used by a certain quack. By properly placing so that the enlarged part was separated from the elbow and giving the screw a few turns each day the tumor was easily removed in a manner similar to that accomplished by an elastic ligature and the position of the clamp was much more easily controlled. The idea is a good one and the necessary appliance easily made. Excising with a knife is painful, and it was shown that the hæmorrhage is at times rather difficult to manage. In discussing this subject the question of the treatment of bursal enlargements, was brought up. In this discussion on bursal enlargements various methods of treatment were given. Dr. Lynchke gave his method, which has certain new features. He has pre-

* Will be published in an early number of the REVIEW.

pared a specially constructed firing iron, consisting of a piece of metal about the size of a hen's egg, into which he introduces a platinum wire, about the size of a knitting needle. With this he punctures the enlargement, making four or five holes. Through these holes the synovial fluid oozes very gradually. After puncturing with the iron he blisters with a counter-irritant, consisting of iodine, potassium iodide and biniodide of mercury. He reports that his treatment is invariably beneficial and usually results in a complete cure. It is absolutely necessary to use a platinum wire, as this metal when hot makes a clean puncture, leaving no foreign matter behind, as is the case with a steel or iron wire. Also the platinum does not adhere to the tissue in its passage into the enlargement.

Dr. C. H. Higgins presented a paper, the subject being "The Laboratory and the Veterinary Practitioner."* In this he explained the manner in which the practicing veterinarian received benefit from laboratory investigation, the general lack of proper autopsies and consequent loss to investigators of valuable material, and that the investigator and practitioner were dependant on one another.

After attending to a few business matters, the meeting adjourned at 1 P. M. C. H. HIGGINS, *Reporter.*

CONNECTICUT VETERINARY MEDICAL ASSOCIATION.

The annual meeting was held at Hotel Hartford, Hartford, Tuesday, February 2, 1904, and was called to order at 12 o'clock, with the President, Dr. H. Whitney, in the chair. The following members and visitors were present: Drs. E. C. Ross, Geo. H. Parkinson, Thomas Bland, A. Hyde, H. Whitney, H. E. Bates, J. H. Gardner, L. B. Judson, G. T. Crowley, W. P. Barnes, C. R. Witte, F. G. Atwood, F. A. Ingram, F. G. McGuire, P. F. Finnegan, F. F. Bushnell, Chas. L. Colton, J. H. Kelley, B. K. Dow, R. P. Lyman, W. H. Carley-Baker. Visitors: Drs. Thos. J. Lee, H. C. Balzer, Geo. L. Elliott, G. E. Corwin, Jr., C. L. Adams, and Dr. B. D. Pierce, of Springfield, Mass., member of the Massachusetts Veterinary Association.

After the roll-call, the minutes of the previous meeting were read and approved.

A communication was read from Dr. John R. Mohler, solicit-

* Will be published in an early number of the REVIEW.

ing funds to aid in the erection of a suitable monument to commemorate the work of the late Professor Nocard. Dr. Andrew Hyde made a motion that the Association contribute the sum of ten dollars to the fund for the Nocard memorial. Dr. Hyde's motion was seconded and carried.

The Secretary's report was read and accepted.

The Treasurer, Dr. Ross, reported a balance of $43.41. The report was accepted.

The following applications for membership were received and referred to the Board of Censors: G. E. Corwin, Jr., D. V. S. (U. S. College of Vet. Surgeons); C. L. Adams, D. V. S., Danielson (American Vet. College); Thos. J. Lee, East Granby (American Vet. College); H. C. Balzer, V. M. D., Meriden (Vet. Department U. of P.); Geo. L. Elliott, V. S., Bristol (Ontario Vet. College.) At the motion of Dr. Kelley, it was voted to suspend the By-Laws at this meeting, and allow the Board of Censors to act upon what work they had before them, and to report at this meeting.

The following officers were elected:

President—Dr. H. E. Bates.

First Vice-President—Dr. J. H. Gardner.

Second Vice-President—Dr. L. B. Judson.

Secretary—Dr. B. K. Dow.

Treasurer—Dr. E. C. Ross.

Board of Censors—Drs. F. A. Ingram, R. P. Lyman, G. F. McGuire, R. D. Martin and F. F. Bushnell.

At 1.30 the meeting adjourned for dinner.

After dinner the members were invited to visit Drs. Colton and Lyman's hospital, where a few cases were in waiting for their inspection. After examining the cases the meeting reconvened at 3 o'clock.

Under the head of "New Business," Dr. Dow presented the following resolution:

"WHEREAS, J. E. Hodgins and T. H. Hasket, in London, Ontario, Canada, under the *nom de plume* of a Veterinary Correspondence School, are issuing a fictitious 'diploma,' to illiterate horsemen, stable-boys, farmers, and others of the same class, thereby enabling them to deceive the public, disgrace the veterinary profession, and become worthless and unprincipled quacks, which are dangerous to the live-stock interests in the localities where they work.

"*Resolved*, That the Connecticut Veterinary Medical Association expresses its strong disapproval of this so-called corre-

spondence school, whose principal object is to obtain money out of the ignorance and cupidity of unprincipled fakers. And be it further

"*Resolved*, That this Association through its members use its best efforts to enlighten the public and live-stock owners of the State as to the true nature of these empirics holding and trying to practice with a mail-order diploma."

This resolution elicited quite a lively discussion; some of the members wanted to strike out certain clauses, while others wished to add amendments. The resolution was finally accepted as read and ordered to be spread upon the minutes as a part of the records of the meeting.

On a motion made by Dr. Gardner, it was voted that the President appoint a committee of five members to act with him and the Secretary as a Legislative Committee, to frame and introduce a bill to the next Legislature to regulate the practice of veterinary medicine, and that the committee report at the next meeting. The President appointed Drs. R. P. Lyman, Thos. Bland, E. C. Ross, J. H. Gardner and G. F. McGuire as the committee.

Dr. Bland offered a resolution as follows:

"*Resolved*, That the Connecticut Veterinary Medical Association urge upon the Connecticut Humane Society, that they frame a law to present to the next Legislature which will give them more power and better control of contagious and infectious diseases, especially glanders, in this State. That the Secretary send a copy of this resolution to the Secretary of the Humane Society."

It was voted that the resolution be adopted.

Dr. Ross read a report of the operations that were performed at the semi-annual meeting. The report showed that all of the operations were successful and that good results were obtained in all of the neurectomy operations, excepting one, which still continued to go a little lame. The doctor said in this case the lameness was due to a mechanical interference produced by ankylosis and not from any fault of the operation. He also said that all of the work done at the clinic turned out well and that this, the first clinic, was a great success.

Dr. F. A. Ingram, one of the Board of Censors, read a petition which had been presented to the Board some time ago. The petition was as follows:

"To the Honorable Board of Censors, Connecticut Veterinary Medical Association: We, the undersigned members of

the Connecticut Veterinary Medical Association, knowing that Dr. F. C. Atwood, of New Haven, Conn., has flagrantly and habitually violated the Code of Ethics of said Association, and believing that his acts are contrary to its aims and purposes, and detrimental to the moral standing of the profession before the public, ask that the matter be investigated at once by the Board of Censors."

The petition was signed by eight members. Dr. Ingram said the Board had complied with the request to investigate the non-professional acts of Dr. Atwood, and that they found that he had wilfully violated the Code of Ethics of the Association in several ways, such as undercharging and speaking disrespectfully of other members, advertising specific plans of treatment, advertising through the medium of posters, bills, photographs of his operations, which he had posted in stables, on fences, buildings, etc., inserting newspaper puffs, etc. Also that he had tried to injure the character and the professional standing and reputation of other members for his own advancement. He said that Dr. Atwood had been warned to desist in doing such work, but he still continued in the practice of violating all rules of professional etiquette and common respect, and that the Board was unanimous in recommending that F. G. Atwood be summarily expelled from membership in the Association. The President inquired if there was anything to be offered in defence of Dr. Atwood, or his acts, as charged by the report of the Board of Censors. Dr. Atwood was present at the morning session, but not present when called for. One of the members said Dr. Atwood knew his case was to be investigated at the afternoon meeting, and that he believed Atwood had no defence to offer, as he had gone home knowing that his case was to be called. Several members expressed themselves as being sorry that Dr. Atwood was not present to hear what was said, and offer some excuse for his acts. But, as much as they regretted having such matters occur which would necessitate the expulsion of a member, they thought that some action should be taken by the Association to protect the members and stop such disgraceful work in the Association.

A vote by rising was taken on the matter. Every member arose to his feet and remained standing, while the President declared a unanimous vote that Dr. Frank G. Atwood be expelled, and ordered that his name be stricken from the roll of membership in the Association.

A vote of thanks was tendered Dr. Whitney, the retiring

President, for his efficient services to the Association the past year. Dr. Whitney addressed the members, saying that the Association was now in a better and more prosperous condition than since its organization, and he hoped that it would grow and continue to prosper. He thanked the members for the honor they conferred upon him a year ago, and for their assistance, kind and courteous treatment during his term of office and he wished the same for his successor.

Dr. R. P. Lyman said he would start the discussion of parturient paresis or so-called milk fever, by describing his treatment with oxygen. The doctor stated that he had treated several cases the past year with oxygen, obtaining the most happy results. One member asked Dr. Lyman how he thought oxygen would work in treating azoturia in horses, to which he replied that he thought if some place in the horse could be found where the gas would be absorbed into the system that it would work well. An interesting discussion followed Dr. Lyman's remarks.

Dr. Thos. Bland invited the Association to hold its next meeting in Waterbury, as he had all the conveniences, and would have plenty of material on hand for a good clinic and a nice lively meeting. It was voted to hold the semi-annual meeting in Waterbury at Dr. Thos. Bland's hospital, Tuesday, August 2, 1904.

At 6 o'clock the meeting adjourned.

B. K. Dow, *Secretary.*

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting was held Jan. 13th, 1904, at the West End Hotel, Portland, with President Salley in the chair.

At roll-call the following members responded: Drs. Wescott, Salley, Joly, Lord, Pope and Blakely.

The minutes of two previous meetings read and approved.

This meeting being the one for the election of officers, the election resulted as follows:

President—Dr. F. W. Huntington, Portland.

Vice-President—Dr. Lemuel Pope, Portsmouth, N. H.

Secretary—Dr. C. L. Blakely, Augusta.

Treasurer—Dr. W. S. Lord, Portland.

After election of officers the members present had the pleasure of listening to a very able address by the retiring President, Dr. Salley. The doctor spoke as follows:

"Upon retiring from my place as President of this Associa-

tion for the past two years, it seems fitting that I should thank you for the high honor you have bestowed upon me, by giving me the highest office within the Association. In relinquishing it to my successor it is proper that I should express a few thoughts to you, not because I have anything new, but that by certain combinations of old thoughts I may express new ideas to some of you. We all have an influence, be it little or much, either for or against, and at this time and for all time I wish to exert what little power I have towards the advancing and raising to a higher standard veterinary medicine, particularly in the old Pine Tree State. It seems to me here is where we most need advancement and certain laws to regulate the practice of veterinary medicine. Quackery flourishes here with freedom, entangling its victims with its cunning and deceptive but erroneous schemes. When I speak of quacks I do not wish to be understood to mean men without diplomas in all cases. Quackery may be practiced by men holding diplomas as well as those without; and, again, a man may be well up in a profession without having taken a collegiate course, and consequently without a diploma. In this connection think of Alexander Pope, a dwarf and an invalid, never able to walk a step, and unable to attend school, yet he became one of the most scholarly and profound thinkers the world has ever known. Diplomas have been and are probably being received from some sources by being bought, and so do not stand for a certain amount of proficiency. Because of these things and many others, it is high time that this State established a veterinary medical examining board for the purpose of obtaining knowledge of and discarding those who have not a reasonable amount of knowledge in the practice of veterinary medicine, whether they hold diplomas or not. Other professions in our State have their examining boards, and there are none of them that need it as much as ours. There are none in which there are so many foolish and cruel ideas practiced as in veterinary medicine. Many times it has made my heart ache to see the suffering and pain our poor dumb and domestic animals are subject to under the pretense of treating disease. I received a letter from a man in the town of Embden the other day, saying he had a cow with the 'horn ale,' that he had bored her horns and was putting vinegar, salt and pepper in them, and wanted to know if I could suggest any other treatment. I replied that it was a disease I had never seen and knew nothing about; that it was like weaning your calves and castrating your colts, when the

sign was right—all poppy-cock. Upon receiving my letter he at once sent for me to come and see the cow. I found that the real cause of the cow's trouble was a retained placenta; pus was bubbling from the holes in the horns, as a result of the inflammation the quack had set up by his hot stuff, which had probably reached quite a part of the mucous membrane lining the sinuses. This is only one of hundreds of cases I have met in my practice, where 'horn ale' or some other imaginary disease has been treated in just as foolish way by some so-called 'cow-doctor,' to the detriment and discomfort of the cow. Many of their methods are so absurd that it is strange they should be tolerated at this late day of advancement in knowledge and science. It is high time something should be done in the line of prevention. I believe we are progressing slowly in this direction each year. I believe that the veterinary medical profession in the State of Maine is stronger than ever before.

"Our American Veterinary Medical Association is a strong body, and exerts a powerful influence in the right direction. Our Bureau of Animal Industry is more efficient than ever before. Many states have passed registration laws and others are about to pass them. This is a strong reason why we should have a registration board at once, because many of these men turned out of the other states will find their way here, unless there is something to prevent. But the wheel of advancement is rolling; it is coming our way, and when it gets to our border let us each and every one be ready and willing to put our shoulder to it and see that it does not stop until it is well across to the Canadian line, and may it leave a trail as deep and lasting as Arnald's Army in its endeavor to reach Quebec years ago.

"It is well for each of us to look well to our private practice and to see that the remunerative part is sufficient for the comfort of our families, etc., but ever and uppermost in the mind of every veterinarian should be the advancement of his professsion. We are too apt when called upon to sacrifice something in the way of time and money for the good of our profession to be too selfish and look to see where we are going to be directly benefited, and if we cannot see that it is going to directly benefit us we will be half-hearted in our efforts. But we are each reaping the fruits from the seeds sown in the past by unselfish veterinarians. The old man, when accosted because he was planting apple trees, the fruits of which he could not hope to eat, replied, 'Some one must have planted trees before I was born, else I could not have eaten the fruits.' The child can never make full

return to its mother whose life trembled in the balance at its birth, and whose kindness and care guarded it in all the years of its infancy. The student cannot make full returns to the teacher who awakened the mind and aroused the ambition for a broader intellectual life. The adult cannot make full returns to the patriarch whose noble life gave inspiration and incentive, but they must make their returns to the generation which comes after them. And so we cannot make returns to the veterinarians gone before or to our teachers. But we must make returns for the good they have done us to the veterinarians who follow us, by doing all we can unselfishly and with a free heart at any and all time for the advancement of our profession."

Next on the programme was an essay by Dr. Geo. F. Wescott, of Portland, entitled "Laminitis,"* and the subject was handled in a masterly way, and called forth a good deal of discussion.

Dr. L. Pope, Jr., from Portsmouth, N. H., read a very interesting paper entitled "A Few Cases of Parturient Paresis," in which he discussed at some length the new treatment with oxygen gas and also the potassium iodide treatment, and different treatments used by him in the last seven or eight years. This paper was an exceedingly valuable one to us, as we all have quite a good many cases of parturient paresis during the year, and many interesting features were disclosed during the discussion which followed.

After the reading of papers a long discussion followed on the methods to be pursued in an attempt to procure the passage of a veterinary registration bill to be presented at the next Legislature, and the members listened to some good sound advice from Dr. Pope, who has had considerable successful experience in obtaining a veterinary registration law for our sister State, New Hampshire, and everybody felt encouraged to try again and keep trying until we succeed in obtaining what we need in Maine.

Afterwards the members adjourned to the hospital of Dr. G. F. Wescott, where a very interesting clinic was held on some cases in the doctor's canine practice, in the line of ovariotomy, radical operation for eversion of uterus, and practical methods of trimming the ears and tail. This clinic was one of the most interesting the Association has ever held, and many new and valuable points were brought out.

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*Will be published in an early number of the REVIEW.

The meeting adjourned at a late hour, after voting to meet in Waterville in April. C. L. BLAKELY, M. D. V., *Secretary.*

ILLINOIS VETERINARY MEDICAL AND SURGICAL ASSOCIATION.

This Association met in annual session at the St. Nicholas Hotel, Jan. 13, with President V. G. Hunt, of Arcola, in the chair, and the roll-call showed a good average attendance. The minutes of the previous meeting were read and approved.

President Hunt next delivered his annual address, which was full of wholesome facts and well wishes for the future of the Association.

The election of officers being next in order, the following were chosen for the ensuing year :

President—Dr. F. J. Bliss, Earlville.

First Vice-President—Dr. W. E. Dawson, Lovington.

Second Vice-President—Dr. I. M. Luzader, Nokomis.

Secretary—Dr. W. A. Swain, Mt. Pulaski.

Treasurer—Dr. V. G. Hunt, Arcola.

President-elect Bliss appointed standing committees as follows :

Committee on Membership—Drs. Travis, J. M. Reed, S. H. Swain, and I. M. Luzader.

Committee on Programme—Drs. F. J. Bliss, S. H. Swain, and W. A. Swain.

Committee on Arrangements—S. H. Swain and F. J. Bliss.

Committee on Legislation—S. H. Swain, C. A. Hurlbutt and F. J. Bliss.

The following papers were read: "Canine Distemper," by Dr. A. Travis, of Litchfield, a very complete and interesting as well as instructive essay, and was responded to by Drs. W. J. Martin and I. M. Luzader; "Contagious Ophthalmia" (Bovine),* by Dr. F. J. Bliss, of Earlville, was an excellent paper and was responded to by Dr. S. H. Swain and others; "Open Joint," by Dr. Jas. M. Reed, of Mattoon, was read by the Secretary, Dr. Reed being unable to be present on account of sickness in his family. This was a good paper and occasioned considerable discussion and comment.

Jan. 14—Meeting called to order by the President.

"Diagnosis of Lameness in the Horse," by Dr. W. J. Martin,

*Will be published in an early number of the REVIEW.

of Kankakee, was a most interesting paper, which called forth considerable discussion. Dr. Smith, of Finley, a visiting veterinarian, entertained the Association by the reading of a paper which had been read before the Southern Illinois Veterinary Association.

Under the head of "Reports of Cases" many interesting subjects were introduced and discussed at length.

Dr. F. J. Bliss reported a case of "Fungosis Toxicum Paralyticus" in a mare which was unable to stand when he saw her. She was treated by the Swain method of injecting ammonia intravenously, and was able to rise to her feet in twenty-five minutes from time of first injection.

On motion, the location of next meeting was fixed for Decatur in August, at such date and place as the Committee of Arrangements shall choose.

On motion the meeting was then adjourned.

W. H. SWAIN, *Secretary.*

PASSAIC COUNTY VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting was held at Dr. J. Payne Lowe's office and veterinary hospital, Passaic, N. J., on Tuesday evening, Feb. 2, 1904, with President Wm. Herbert Lowe in the chair. The members present at the meeting were Dr. J. H. Degraw, Dr. Wm. H. Lowe, Jr., Dr. Wm. Herbert Lowe, Dr. Wm. J. Regan, Dr. Geo. W. Pope, Dr. R. O. Hasbrouck, Dr. J. Payne Lowe and Dr. Wm. J. Fredericks. Associate members present were Dr. J. B. Hopper, Ridgewood, and Dr. R. W. Meiners, Union Hill, N. J.

The minutes of the last meeting were approved as read.

The Secretary was instructed to communicate with the Treasurer and find out if he had forwarded the five dollars to the Prof. Nocard Monument Fund, which had been donated for that purpose. The Secretary reported bills for stationery, which were ordered paid.

Dr. Wm. Herbert Lowe made a motion that Dr. R. F. Meiners be a regular Associate Member of the Association, which was carried unanimously.

Dr. J. Payne Lowe performed ovariotomy on a bitch, which was very successfully done, and then gave a demonstratian on using a mouth speculum in the dog, and passing a probe down the dog's throat to find any foreign substances that might be lodged there.

Dr. J. B. Hopper gave a demonstration on setting up a horse's tail after docking, and also of straightening a horse's tail that is carried to one side or the other.

Naso-œsophageal intubation in the horse was demonstrated by Dr. Geo. W. Pope. Before attempting the operation, Dr. Pope stated his desire that all present should understand that the operation was not original with him; that at a meeting of the Illinois State Veterinary Medical Association, held in Chicago last December, he heard an interesting discussion on the subject of acute indigestion, and that Dr. Joseph Hughes, of Chicago, at that time expressed an opinion that a tube could be passed through the nasal chamber into the stomach of the horse and relief in this way be afforded. At a clinic following the discussion, Dr. Hughes had passed the tube without difficulty, and without assistance. "My aim will be," said Dr. Pope, "to demonstrate what was done by Dr. Hughes at that clinic. This will be my first attempt at passing the tube, and in case it does not reach the stomach, I beg you to remember that it is an experiment as far as I am concerned." A ten-foot rubber tube was then produced, and without assistance passed by the demonstrator through the right nostril of the subject and into the stomach. Some thought that the tube had passed farther than the lower third of the œsophagus. However, Dr. J. Payne Lowe produced a force pump and injected two gallons of water into the stomach and siphoned it out with a considerable quantity of the stomach's contents. A discussion followed the demonstration, and Dr. Pope was requested to repeat the operation at the next meeting of the Veterinary Medical Association of New Jersey.

Dr. Wm. Herbert Lowe made a motion that a vote of thanks be extended to the chief operators, Dr. J. Payne Lowe, Dr. J. B. Hopper, and Dr. Geo. W. Pope, which was seconded and carried.

There was a motion made, seconded and carried, that our next regular monthly meeting should be held in Paterson at Dr. Wm. Herbert Lowe's office, at 169 Paterson Street, March 1, 1904.

As there was no other business to bring before the meeting, the Association adjourned. WM. J. FREDERICKS, *Secretary.*

KANSAS STATE VETERINARY MEDICAL ASSOCIATION.

SALINA, KANSAS, February 18, 1904.

Our meeting to effect a State organization was a grand success, there being a very good attendance. We met in the City

Council Chambers in Topeka, and adopted a Constitution and elected officers for the coming year, as follows:

President—Dr. George Pritchard, of Topeka.

Secretary—Dr. Hugh S. Maxwell, of Salina.

Treasurer—Dr. W. T. King, of Olatha.

Executive Board—Dr. D. O. Krusely, Topeka; Dr. T. W. Hadley, Kansas City, Kan.; and Dr. C. B. McClellan, Laurence.

We are to have a Vice-President from each Congressional District, but at present have elected only Dr. C. A. Monney, of Hiawatha, from the First, and Dr. C. B. Kern, of Beloit, from the Sixth Districts.

We start out with fifteen members, but are receiving communications almost every day from veterinarians over the State, asking for information in regard to becoming members. There are about one hundred eligible veterinarians in the State, and we hope none will fail to join with us, at their earliest possible convenience. There is no reason why we cannot have a very good organization and a grand annual meeting in January, 1905, if each one will only do his part. The Kansas stock-grower is badly in need of protection from the abuse he is receiving at present from many quacks operating in the State. The State is now ready for something of this kind, and it is our just duty to lend our united effort in securing something beneficial.

We hope every veterinarian in the State will show the interest, and take hold of the work in as earnest a manner as did Dr. Moore, of the K. C. V. C.; he was at the January meeting, and was ever ready to assist us in any and every way possible, for which we thank him very much, and hope he will be with us again at our first annual meeting to be held in Topeka, January, 1905. HUGH S. MAXWELL, *Secretary.*

GENESEE VALLEY VETERINARY MEDICAL ASSOCIATION.

The annual meeting of this Association was held at the Whitcomb House, Rochester, N. Y., on Thursday, Jan. 14th, 1904, and, in spite of the inclement weather and the bad condition of the roads, a large percentage of the members were present.

The meeting was called to order by the President, Dr. O. B. French, of Honeoye Falls, and the minutes of the previous meeting were read and approved.

The report of the Treasurer showed the Association to be in good financial condition.

The application of Dr. Joseph L. Wilder, of Akron, N. Y., was presented and referred to the Board of Censors.

The following officers were elected for the ensuing year:

President—Dr. G. C. Kesler, Holley.

Vice-President—Dr. A. McConnell, Brockport.

Secretary—Dr. J. H. Taylor, Henrietta.

Treasurer—Dr. A. Geo. Tegg, Rochester.

Board of Censors—Drs. L. R. Webber, O. B. French, W. E. Stocking, H. S. Bebee, J. E. Smith, and J. W. Corrigan.

Drs. D. P. Webster, of Hilton; W. G. Dodds, of Canandaigua, and J. W. Corrigan, of Batavia, were appointed to look up illegal practitioners and report at the next meeting.

After the formal seating of the new officers, Dr. H. S. Bebee read a very interesting paper on his own observations on "Navicular Disease," which was followed by a lively discussion.

Dr. Carr Webber reported a very interesting case of impaction of the cæcum, which brought forth many different ideas as to treatment.

Dr. J. H. Taylor read a paper on "The Use and Abuse of Cathartics in the Treatment of the Various Forms of Colic."

The next meeting of the Association will be held in Rochester in July. This meeting will be taken up largely with clinics, and an informal discussion on the various cases presented for operation or treatment.

Drs. L. R. Webber, J. H. Taylor and J. E. Smith have charge of the programme for this meeting.

J. H. TAYLOR, *Secretary.*

RHODE ISLAND VETERINARY MEDICAL ASSOCIATION.

The annual meeting of this Association was held at the Hotel Dorrance, Providence, R. I., Jan. 28th, 1904. The meeting was called to order at 3.30 P. M. by Vice-President Dr. L. T. Dunn, and upon roll-call nearly every member responded to his name. The minutes of the previous meeting were read and approved.

The first business was the report of the Committee on Legislation. The Committee in making their report, explained what, in their estimation, caused the defeat of the veterinary bill presented to the legislature last February, and also stated that they positively refused to serve the Association further in this capacity.

The election of officers resulted as follows:
President—Dr. J. S. Pollard.
First Vice-President—Dr. L. T. Dunn.
Second Vice-President—Dr. R. L. Tucker.
Secretary—Dr. T. E. Robinson.
Treasurer—Dr. J. T. Cunningham.

It was moved and carried that the officers of the Association constitute an Executive Board. The Legislative Act was placed in the hands of the Executive Board, with power to proceed.

It was voted that the Chair appoint a committee of three to confer with the Master Horse Shoers' Association, relative to the proposed veterinary bill.

After a somewhat lengthy discussion on various subjects of interest to the profession, it was voted to adjourn.

Next regular meeting June, 1904, at Providence.

T. E. ROBINSON, *Secretary*.

NEWS AND ITEMS.

DR. ROBT. LEEPER, Inspector B. A. I., Kansas City, has been transferred to Wichita, Kans.

DR. WALTER WARREN, of Windsor, Mo., is taking a post-graduate course at the Kansas City Veterinary College.

DR. F. W. WESTON, Inspector B. A. I., Wichita, Kans., has been transferred to Kansas City.

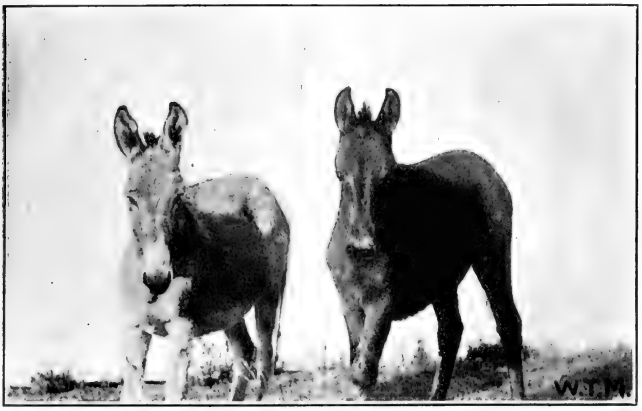
DR. A. W. SMEDBERG, Inspector B. A. I., Kansas City, met with a painful accident recently, slipping on an icy pavement and breaking his leg above the ankle.

DR. FRANK STARR, who served two years in the Quartermaster's Department, U. S. Army, Philippines, has returned and entered into practice in his home-town, Odessa, Mo.

RECENT MEDICAL ADVANCES.—A cablegram to the New York *Herald* of Feb. 27, says: "Dr. Doyen has just communicated to the Académie des Sciences a monograph on a method of cancer treatment based on an injection of a toxine microbe known as micrococcus neoformans. . . . . Twenty-one cases, it is claimed, were cured by means of the injection, and forty-seven more cases are under observation. At a meeting of the Academy of Sciences Professor Berthelot communicated the results of fresh experiments with radium by Dr. Phisalix at the Museum. After fifty-eight hours' exposure to the action of a

tube of radium the venom of a viper in solution was so affected that a guinea-pig might be inoculated with a strong dose of the poison without the slightest danger. The longer the poison is exposed to the action of radium the weaker it becomes."

AN HAWAIIAN HYBRID.—Dr. W. T. Monsarrat, of Honolulu, H. T., has kindly furnished the following history and photo of an interesting little beast which is the first of his species bred upon those tropical isles: "I send you some photographs of a hinnie and its dam, which were bred by my brother, J. Monsarrat, at the Kapapala Ranch, Hawaii. The dam is a she ass, which are used a great deal on the Island as pack ani-



mals; the sire is a thoroughbred, by The Mallard, he by Fellowcraft—Teal; Fellowcraft by Longfellow. The colt is six months old and is at least a hand taller than its dam, as you can see by the photographs. There is quite a difference between the looks of the dam and colt. I was the photographer. This is said to be the first animal of this kind on the Islands."

TO CAPTURE THE WHITE PACERS.—*Salt Lake, Utah, Feb. 13.*—Strangest of all equine bands, the "white pacers" of the southern range, are doomed to captivity or extermination. The ranchmen of Southern Utah, Western Nevada and a strip of Arizona have passed sentence on this remarkable aggregation of one hundred wild horses that for seven years have mocked every effort at capture. The stockmen of the border country

engaged a few weeks ago in a wild horse hunt—a raid on the wild mustangs that have become a pest of the range. Many animals were killed, but the "white pacers" were not met. Even if the opportunity had presented itself no attempt to kill them would have been made. The ranchmen have for years cherished the hope of some day capturing some of the beautiful animals, and so none have ever been shot. Individual attempts to take them, however, have always failed, and now an organized and determined effort is in project. Plans have been made with a full knowledge of the habits of the quarry and the nature of the country, and it is hoped that a dozen or more of the coveted equines will be taken. If necessary, several of the horses will be killed to make the work of capturing the others easier. The much desired animals are of magnificent build. They are all white and have long manes and tails of the same color. In speed they easily outstrip the ranch horses. A strange feature is that the animals are all pacers. Very seldom have they been known to break into a run, and then only for a short distance, soon relapsing into the long, swift stride that appears to be their natural gait. The ranchmen believe that some of these animals can be trained to become great racehorses. A great stallion, of splendid proportions, is the leader of this equine family. At the head of the band this stallion has led his followers in wild dashes over the hills when pursued by the ranchers, and the pace was so rapid that the hunters were soon compelled to desist. These horses are reported to be ranging along the Colorado river. In the summer they come up into Utah. It is planned to effect their capture by having several parties act in concert and drive the horses into a trap—probably into a box canyon.—(*New York Herald.*)

UNIFICATION OF VETERINARY AUTHORITY IN CANADA.—The resignation of the Provincial Veterinarian for Manitoba, after some twelve years or more of faithful, well-rendered service, makes the time opportune for the transfer of the handling of contagious diseases of animals to the Dominion by the Manitoba Government. This move was suggested in the *Advocate* at the time of the change in the chief inspectorate at Ottawa about two years ago. Since the work has been attended to in the Province by Dr. S. J. Thompson there has been marked improvement in the control of contagious diseases of animals, obtained at less expense than when the district veterinarian scheme existed, and since the office has been vested in one man we have ceased to hear of glanders in cows (!) Under the new

Dominion Act of August last, the control of contagious diseases in animals becomes fully vested in the veterinary branch of the Department of Agriculture at Ottawa, and there is now nothing to be gained by the continuance of the office of Provincial Veterinarian. The lack of a head to whom the outlining of a veterinary policy could be referred, and the saving of expense, as well as the uselessness of a duplication of work by officials, are all cogent reasons for the abolition of this office in the Province. There is no doubt but that use can be found for the money saved right in the Provincial Department of Agriculture. Last year's report of the Provincial Veterinarian shows the number of cases of glanders (that seemingly being the most important animal contagious disease met with) attended to, and the supposed sources of contagion are hinted at, the inference being that there is yet a weak spot to be strengthened in the work of the veterinary branch of the Dominion Department of Agriculture; whether the breach in the ramparts is at the boundary ports or in the interior is apparently unsettled. The veterinarians of the N. W. M. P. attend to the handling of contagious diseases of animals in the territories for the veterinary branch, and are believed to render the most efficient service at the least cost of any section of the branch. Should the transfer be made as suggested, a strengthening of the whole service may be expected, and the possibility of one Province infecting another with impunity be stopped. All the men in different Provinces being placed under the one head will certainly make for increased efficiency of the whole, one result of which will be the extermination of glanders throughout the West. No compensation is paid by the Dominion Government for glandered horses; in hog cholera, compensation at the rate of one-third value for diseased hogs slaughtered by the inspectors and three-fourths for the cohabiting swine free from disease and slaughtered by inspectors is paid. It is questionable whether it would not be better to abolish the system of compensation altogether, or else place the diseases on an equal footing as regards the giving of compensation. Some hold that compensation is an inducement to people to reveal the presence of a contagious disease in their stock; it is well to remember that under the Act severe penalties may be enforced for concealing such diseases!—(*Farmer's Advocate, Winnipeg, Feb. 10.*)

Veterinary Student's Banquet at Ithaca.—The first annual banquet of the New York State Veterinary College, Cornell University, was held on the evening of Feb. 10, at the

Campus Tavern, Ithaca. Sixty-two students, members of the faculty and a few alumni partook of the feast. The after-dinner speakers were introduced in an able manner by the toastmaster, W. B. Mack, '04. Dr. James Law, in a humorous, instructive way, described the veterinarian of the past. Dr. W. L. Williams revealed the veterinarian of the present. Dr. G. S. Hopkins made a strong plea for a four year course in the college. Dr. P. A. Fish, in light vein, but with seriousness, spoke on the benefits to be derived from coöperation, and Dr. V. A. Moore prophesied for the scientific attainment and the high position to be taken by the veterinarians of the future, who should build on the foundation laid by such men as Dr. Law. The student body was represented by A. M. Seaman, '04; C. H. Taylor, '05; and W. J. Taylor, '06; and Dr. Garry T. Stone, of Binghamton, spoke for the alumni. Comic and college songs interspersed the toasts, and at a late hour the company scattered, with a firm resolve to make this the first of a series of pleasant and profitable annual gatherings.

Loss of Hoofs from Neurotomy.—Dr. A. W. Baker, of Brasher Falls, N. Y., writes under date of Feb. 1: "I notice an article in the December Review by Dr. John J. Repp on the loss of hoofs from plantar neurectomy for navicular arthritis. I am surprised, for I always select those kind of feet for a successful operation. I would like to know if there were corns in those two feet. I am greatly interested in those operations. I have operated on a great many horses, some used in livery, some on the farm, and some on stage routes, and they are still in service. I try to select good strong hoofs. I always keep them in the infirmary for two weeks after the operation, and do not permit them to be put to hard work until all inflammation has disappeared from the limbs and hoofs, which are kept soft. I would like to hear from others on the subject."

Agglutination in Glanders.—Heanley has investigated the serum reaction in two cases of glanders, and finds that, while clumping of glanders bacilli is caused by various sera, the sedimentation test, with a dilution of 505 and a time interval of at least four hours, gives positive specific results, no reaction being obtained with any serum but that of glanders. —(*London Lancet, Feb. 6.*)

Notwithstanding the fact that the present number of the Review contains 132 pages, it must ask the indulgence of many contributors whose valued articles are held over for subsequent issues.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table will be found the dates, places of meeting, and Secretaries' names and addresses of all the Veterinary Medical Associations of the United States and Canada, so far as obtainable by the REVIEW. Secretaries are urgently requested to see that the organizations which they represent respectively are included in the list, and that the details concerning them are properly stated.

Name of Organization.	Date of Next Meeting.	Place of Meeting	Name and Address Secretary.
American V. M. Ass'n.....	Aug. 16-19, '04.	St. Louis, Mo.	J. J. Repp 5249 Addison St., Phila., Pa.
Vet. Med. Ass'n of N. J.....	July 14, 1904.	Newark.	G. W. Pope, Athenia, N. J.
Connecticut V. M. Ass'n.....	August 2.	Waterbury.	B. K. Dow, Willimantic.
New York S. V. M. Soc'y....	September, 1904	Brooklyn.	W. H. Kelly, Albany, N.Y.
Schuylkill Valley V. M. A....	.....	.....	W. G. Huyett, Wernersville, Pa.
Passaic Co. V. M. Ass'n.....	March 1.	Paterson, N.J.	W. G. Fredericks, Delawanna, N. J.
Texas V. M. Ass'n.....	March 9.	Fort Worth.	H. D. Paxson, Ft. Worth.
Massachusetts Vet. Ass'n.....	Monthly.	Boston.	F. J. Babbitt, Lynn, Mass.
Maine Vet Med. Ass'n.....	April, 1904.	Waterville.	C. L. Blakely, Augusta.
Central Canada V. Ass'n.....	.....	Ottawa.	A. E. James, Ottawa.
Michigan State V. M. Ass'n...	.....	.....	Judson Black, Richmond.
Alumni Ass'n N. Y.-A. V. C..	April, 1904.	141 W. 54th St	W. C. Miller, N Y. City.
Illinois State V M. Ass'n.....	.....	.....	W. H. Welch, Lexington, Ill
Wisconsin Soc. Vet. Grad.....	Call of Pres't.	Racine.	S Beattie, Madison.
Illinois V. M. and Surg. A....	August, 1904.	Decatur.	W. A Swain, Mt. Pulaski, Ill
Vet. Ass'n of Manitoba.....	.....	.....	F. Torrance, Winnipeg.
North Carolina V. M. Ass'n...	July, 1904.	Greensboro.	T. B. Carroll, Wilmington.
Ontario Vet. Ass'n.....	December, 1904	Toronto.	C H. Sweetapple, Toronto.
V. M. Ass'n New York Co....	1st Wednesday of each month.	141 W. 54th St	D. J. Mangan, N. Y. City.
Ohio State V. M. Ass'n.....	August, 1904.	St. Louis, Mo.	W. H. Gribble, Washington C. H.
Western Penn. V. M. Ass'n...	1st Wednesday of each month.	Pittsburgh.	F. Weitzel, 100 Parkway, Allegheny.
Missouri Vet. Med. Ass'n.....	Aug. 15, 1904.	St. Louis.	Stanley Smith, Columbia.
Genesee Valley V. M. Ass'n...	.....	.....	J. H. Taylor, Henrietta, N.Y.
Iowa State V. M. Ass'n.....	.....	.....	H. C. Simpson, Denison, Ia.
Minnesota State V. M. Ass'n..	.....	.....	J. S. Butler, Minneapolis.
Pennsylvania State V. M. A...	March, 1904.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila.
Keystone V. M. Ass'n.....	2d Tuesday of each month.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila
Colorado State V. M. Ass'n...	1st Mon. in June	Denver.	M. J. Woodliffe, Denver.
Missouri Valley V. Ass'n.....	June, 1904.	Undecided.	B. F. Kaupp, 3712 Michigan Ave., Kansas City
Rhode Island V. M Ass'n....	June, 1904.	Providence.	T. E. Robinson, Westerly, R I
North Dakota V. M. Ass'n....	2d Tues. Jan.	Fargo.	E. J. Davidson, Grand Forks
California State V. M. Ass'n...	Mch. Je. Sep, Dc	San Francisco	P. H. Browning, San Jose.
Southern Auxiliary of California State V. M. Ass'n....	Jan. Apl. Jy, Oct.	Los Angeles.	H. D. Fenimore, Los Angeles
South Dakota V. M. A.....	.....	.....	E. L. Moore, Brookings.
Nebraska V. M. Ass'n.....	.....	.....	A. T. Peters, Lincoln.
Kansas State V. M. Ass'n....	January, 1905.	Topeka.	Hugh S. Maxwell, Salina.

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AMERICAN

VETERINARY REVIEW,

EDITED BY

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VOLUME XXVII.

NEW YORK:

PUBLISHED BY THE EDITORS,

509 WEST 152d STREET.

ILLUSTRATIONS IN VOLUME XXVII.

TABLE OF CONTENTS. VOLUME XXVII.

EDITORIAL.

ORIGINAL ARTICLES.

REPORTS OF CASES.

EXTRACTS FROM EXCHANGES.

ABSTRACTS FROM MEDICAL LITERATURE.

REVIEW OF BIOLOGY.

ARMY VETERINARY DEPARTMENT.

BIBLIOGRAPHY.

CORRESPONDENCE.

OBITUARY.

COLLEGE COMMENCEMENTS.

SOCIETY MEETINGS.

MISCELLENEOUS ARTICLES.

American Veterinary Medical Association Journal