













Journal

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, August 15, 1911.

DISLOCATION OF THE PERFORATUS CALCANEAN CAP.— Although not very common this injury has, however, been recorded in veterinary journals and its symptomatology is well described in our text books. Among the most recent description is the excellent article from Prof. Hendrickx of Belgium, published in the *Annales de Médecine Vétérinaire* of Brussels. The symptomatologic history is classic. Resulting from several various causes which are yet rather undetermined, it has been observed according to the various cases recorded after running, with fall backwards, violent kicking backwards, with or without fall, slipping, sudden stopping while in full gallop, etc., etc.

The objective symptoms are those of a violent pain in the calcanean region, the animal being lame on three legs. The leg is immobile and in extension. There is also a diffused œdematous swelling on the posterior face of the hock which after several hours or days has become defined and on one face of the os calcis, most commonly the external, at three or four centimeters from the summit of the bone, there is noticed a funicular band, extremely stretched, which can be easily pushed back over the

bone, but returned again more or less suddenly as soon as the relaxation is allowed. Whether these displacements of the cap take place outwards or inwards they are accompanied with a kind of snap perfectly perceptible.

This symptomatology has again been recalled in the same Belgian paper by Prof. N. Zwaenpoel and Mr. G. Declercq, and has given them the opportunity for calling attention to two points relating to the disease, the pathogeny, which is yet rather undetermined, and again the treatment.

\* \* \*

In relation to the pathogeny, after a review of the various determining causes and quoting the saying of Pader: "The precise causes of this accident still remains doubtful, as is proved by the few observations relating to it"—then the writers have asked themselves, if by surgical experiment some light could not be thrown on the subject. Why should this dislocation be more common to the out than to the inside. "For the realization of this dislocation, first the rupture of one of the two aponeurotic bands which hold the cap in place should have taken place. If one is ruptured, it goes by itself that the tendon, not being held on that side, should slide on the opposite." The Professor and his colleague divided the inner band only, then the outer, and then both, with what results: "With the section of the inner branch they failed in having any displacement of the cap, which remained in its position, while the division of the external was followed by dislocation inwards"—a peculiar condition which seemed to me in contradiction with clinical records, which say that the accidental luxation takes place ordinarily outside and exceptionally inside.

The authors then inquired if the internal dislocation following the section of the external band was more due to the oblique disposition of the gliding surface of the os calcis than the peculiar situation of the tendon, and they divided the two bands: the dislocation took place on the inside. They cut the tendon of the

bifermoro-calcaneus muscle and the internal dislocation remained.

To resume, the luxation is due to several factors:

1. The contraction or rather the excessive stretching of the perforatus tendon, probably insufficient, as it ought to produce the dislocation inwards instead of outwards, as it is more commonly seen;

2. An insufficient stretching of the tendons of the gemelli; when then the curve of the perforatus disappears and the dislocation outwards is possible;

3. A sudden motion of laterality of the point of the hock or of the entire hock, acting as an essential factor in the accident, while the condition of the perforatus and the gemelli, though indispensable factors, are but of secondary order. The external band of the calcanean cap is more resisting than the inner one and this must give way oftener.

\* \* \*

The prognosis of this accident is generally serious—although there may be some varieties in the extent of the lesion and it is a question to consider if an animal ought to be treated with chances of useful recovery. Local applications of various natures have been resorted to, immobilization of the joint, irrigations, etc., etc., have been recommended and tried with doubtful results. The suture of the injured band has also been advocated. Vogt and Hendrickx have recommended the tenotomy of the perforatus performed below the calcanean apex. The patient of Vogt had a large high spavin as result, and that of Hendrickx a diffused osteitis of the os calcis.

In conclusion of their article, Prof. Zwaenpoel and Mr. Declereq say: "Eight days after the accident when the inflammatory phenomena have subsided we have performed tenotomy of the perforatus *a few centimeters above the point of the hock*, where the perforatus comes out from under the tendon of the gemelli; the pain and the mechanical difficulty disappeared almost instantaneously. The animal was put to pasture, recovered and

was able to perform his work perfectly in a short time." For the authors this tenotomy, performed above the hock, is better indicated than the metatarsal, as it relieves completely the stretching of the cord, due to the muscular contraction of the fleshy body of the perforatus and that resulting from the closing of the angle of the hock.

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EXPERIMENTAL MEDICINE has made, since its first introduction in sciences, very gradual progress and its application is now reigning extensively all over the world, whether it finds its material in human or in veterinary pathology, and whether it has for its object diseases of men or animals, everywhere experimental researches are carried out and the results obtained are recorded in scientific journals.

Among the most recent, which were published in the *Berliner Klin. Wochen.* are those of Uhlenhuth and Mulzer on the *inoculation of syphilis in rabbits*, a subject which is not without interest to veterinarians, besides that of comparative medical experiments.

The first experiments of inoculation of human syphilis to rabbits were made by Bertarelli in the eye. Parodi afterwards inoculated it in the testicle of rabbits. Uhlenhuth and Mulzer renewed their experiments in the testicle and in the blood. The infection is quite easy—they obtained 10 out of 17 animals inoculated. By successive inoculations from testicle to testicle, they had good results to the sixteenth passage, the virulency increasing after each one. The incubation then gradually diminishes, from 8 to 12 weeks it dropped to 6 and 4. The intensity and the severity of the testicular lesions increased also.

To the clinical point of view, the authors consider that experimentally three forms can be obtained:

1. Ulceration of the skin and scrotum, sometimes not localized to the place of incubation. This ulceration corresponds to the primitive chancre of man and contains numerous spirochetes. Testicles are ordinarily free.

2. There is chronic orchitis, with scrotum free from lesion.

3. Total or partial thickening of the testicular envelopes, diffused or limited periorchitis.

All these accidents may disappear spontaneously. They are not followed by secondary accidents, although there are cases when general affection occurs after the scrotal inoculation, as it has also been observed with an intra-ocular infection.

However, can a generalized syphilis be promoted by inoculation made directly in the blood, was the question which the authors tried to solve. Their first attempts were unsuccessful. But by successive passages in rabbits, they finally succeeded in obtaining very virulent virus and in four adult animals obtained lesions of circumscribed syphilitic orchitis and periorchitis, testicular and scrotal erosions, corneal ulcerations. Two rabbits which had died without presenting any lesions had their organs full of spirochetes. In resorting to young rabbits and making the inoculation by intra-cardiac injection, although some animals did not stand the operation and died, those which survived presented peculiar manifestations.

"Shortly after the injection, the animals dropped on their side, with difficult respiration, but rallied and presented no trouble for the first weeks. After six or ten weeks the skin became squammy, appetite diminished and noticeable loss of flesh were observed."

"Then appeared on each side of the nose small little indurated tumors containing spirochetes. A similar one is observed near the tail. There were cutaneous ulcerations on the chine, ocular region. Conjunctivitis and keratitis were often present."

"Then the claws became swollen and fell off leaving superficial ulceration containing spirochetes. Sometimes there were papulo-ulcerous syphilids."

All these syphilitic manifestations may disappear but, in the human disease, relapses are frequent."

\* \* \*

The above remarks relating to a domestic animal, found so extensively everywhere, and which might become infected naturally

(?) outside of the laboratory, are interesting, and to complete this review in *Experimental Medicine*, let me glance at the *Researches on the Etiology of Scarletina*, by Prof. G. Bernhardt, reported in the *Deutsche Med. Woch.* and which I find in the *Presse Médicale*.

The question of the inoculation of scarlatina to animals is actually at the order of the day. Cantacuzene has presented recently to the Society of Biology the result of his researches on this subject. He succeeded in giving scarlatina to monkeys by injecting blood of sick individuals, taken at the beginning of the eruption, or pericardic fluid or tracheo-bronchial glands.

Landsteiner and Levaditi inoculated in the throat and under the skin of chimpanzees products from the amygdals or the blood taken from scarlatina patients and promoted in them a febrile infection characterized by a sore throat similar to that of scarlatina and a generalized eruption. At the autopsy of one, lesions of the kidneys and of the skin resembling those of scarlatinous infection, with a swelling of the glands, were found.

Bernhardt has renewed the researches on a series of various species of monkeys, and has used for material of inoculation the thick whitish coating of the tongue of a scarlatinous individual, which was crushed in a mortar with serum. This was shaken for an hour and 4 c.c. were injected in the skin of the armpit of a monkey, deposited on the tongue, the cheeks, the amygdals after a stiff rubbing of the mucous.

The next day the first inoculated monkey had fever and swelling of the glands. After three or four days the animals were very sick and their tumefied glands were removed and used for inoculation to other monkeys. With the sterilized glandular preparations one monkey was inoculated. After four days his temperature was 39.9° C., he had generalized adenopathy and the tongue thickly coated. The skin was red on the neck, the shoulders and the face. The well developed miliary eruption was present on the shoulders, neck and trunk. The next day desquamation of the skin began. Temperature dropped to 34.5° C. The monkey recovered entirely."

Bernhardt continued his experiments in using sterilized solutions filtrated on Berkefeld, and of four experiments two were negative and two positive. With only the frottis of a lingual coating of a man upon the buccal mucous of a monkey, a scarlatiniferous disease, with 18 days' incubation, was produced. An emulsion, made with an inguinal gland from the body of a dead child inoculated to a monkey, gave rise in six days to symptoms of scarlatina and followed by death the thirteenth day of generalized septicæmia.

Other results which were also obtained during these experiments are now the object of other researches which will be referred to later on.

\* \* \*

RAILROAD DISEASE OF BOVINES.—In glancing over the *Revue de Leclainche* for the month of July, I came across the résumé of an article from the *Berliner Tierärztliche Wochenschrift*, published some time ago, on the pathogeny and treatment of the so-called affection and having failed to find anything relating to it in any publication at my disposal, I thought the subject might be interesting to our readers, as it has been to me.

Prof. Dr. Schmidt is the German author. "In Germany is designated under the name of *Railroad Disease*, *Railroad Fever*, *Traveling Fever*, an affection of bovine consecutive to a journey by rail.

The disease was described in the works of Friedberger and Fröhner and those of Hutyra and Marek, and been well observed by Estor, Villagio and Saxony veterinarians. It especially affects cows in advanced stage of pregnancy, which had just been taken off from pastures. It is, on the contrary, rare among animals fed in the stable. In the warm season, from April to September, it is more common.

The manifestations can be grouped in two periods: (1) One of excitement; (2) one of depression.

The first signs consist in a kind of atony in the glance of the eye and paresia of motions. The hind legs are often crossing

each other by staggering gait, which is very uncertain. The animal remains lying down, often changing his position. The anterior legs seem to be yet able to stand up, while the hind quarters appear paralyzed.

In the meanwhile sensorial troubles increase. While in the same animals the ears are constantly moving, listening to the slightest noise, and the eye reacts by the simplest excitation, the cows are generally somnolent, sleepy, stretched on the bedding, with the legs slightly flexed, the head brought back as in parturient fever. The eyes are closed and the pupils dilate. The temperature remains about normal between  $38^{\circ}$  and  $39^{\circ}$  C. The pulse, frequent in the period of excitement (sometimes up to 120 per minute), soon returns to normal; also the beatings of the heart are regular. The respiration is, during the whole disease, difficult, costo-abdominal, with irregular rhythms. Moaning is frequently heard during expiration.

Appetite and rumination have disappeared from the start. Motions of the rumen and intestine are absent or very rare. The animals refuse all drinks or again take them in abnormal quantity. There is nothing wrong about the genital organs. Movements of the foetus are generally very visible, the udder is filled with milk and yet elastic. Almost always urination is stopped and the bladder is distended by a urine, yellow orange color, alkaline and albuminous.

The prognosis is unfavorable, death occurring in coma from 24 to 48 hours after the first manifestations.

\* \* \*

Writers on this disease insist on the absence of constant organic lesions. Voigtlander finds all the organs normal, except the rumen, which is almost empty. "He has never seen it in such a state of vacuity." Weigel makes the same remark but notices the congestion of the liver, of the intestine and of the uterus. For Noack and Estor there is an alteration of the muscles, they are red or black brown in color. There is also a

fatty degeneration of the parenchymatous organs. Schmidt has failed to detect any lesion and the muscles were found normal.

There is no positive data in relation to the pathogeny and etiology of the disease. The idea of want of food, suggested by the condition of the empty rumen, is not to be considered. Villagio thinks it to be a primitive affection of the muscles, with secondary nervous troubles. Estor is somewhat of the same opinion and considers the disease very much like hemoglobinuria of horses.

The supposition of a trouble of the circulation in the nervous centers seems to be the most plausible. As remarks Estor, a long journey on railways imposes on these animals an enormous muscular effort, they must stand in equilibrium, with all their muscles in contraction. This condition is made more severe in cows advanced in pregnancy on account of the weight of the uterus and its contents. An enormous quantity of blood is held back in the muscles; the uterus and placenta are also gorged with blood, the udder likewise, which, according to Rubeli, retains itself alone one-fifth of the total mass of the blood.

The result is an excessive anæmia of the parenchymatous organs, especially the lungs and an hæmotosis insufficient. The pathogeny of these conditions is very comparable to that of parturient fever, as indicated by Hutyra and Marek.

The treatment of railroad fever was simply symptomatic; absolute rest, bleeding, friction of the loins, morphine, strychnine, alcohol \* \* \* have been recommended, or again, tartaric acid, wet blanketing, coffee or digitate, etc.

In 1901 the author thought of trying the systematic treatment of parturient apoplexy by injection of a solution of iodide of potassium in the udder and later he gave that up to replace it by the simple injection of air. The result was as certain as it was quick. Recovery is obtained as easily as in parturient fever. One injection of caffeine completes the treatment.

To resume: 1. "Railroad Disease" is due to an anæmia of the central nervous center caused by the journey and associated to a pathogenic action upon the vaso-motor system. 2. The best

mode of treatment consists in injection of air in the udder, completed by the use of cardiac tonics. 3. Proper prophylactic method is still unknown.

\* \* \*

INFLAMMATORY TUBERCULOSIS AND VASCULAR GLANDS.—This interesting pathological relation was recently the object of a communication before the *Academy of Medicine*, which was presented by two learned pathologists, Drs. Poncet and Leriche. After recalling the rarity of specific, follicular tuberculosis, on the level of the bloody vascular glands, thyroid, pituitary, suprarenal, ovaries, etc., for them on the contrary, inflammatory tuberculosis is very common in them. In the presence of an attack from Koch's bacilli, these glands react by processes of cirrhosis, adenomatosis, without characteristic follicular lesions. Under the effect of a continuous bacillar irritation, bacterian or toxic, these glands are placed in secreting inferiority or perform only altered secretions; and from these result all kinds of peculiar diseases, erroneously called primitive and wrongly named essential, whose symptomatology, more or less severe, completely covers the real cause which is then discreetly concealed.

It is thus that the inflammatory tuberculosis of the thyroid gland becomes the cause of various troubles of growth, that it promotes by the presence of the thyroiditis, varieties of goitre and their accidents and complications.

It is the same for the development of the skeleton, with the lesions of the hypophysis.

With the pancreas, inflammatory tuberculosis promotes numerous cases of diabetes, and with this class of sicknesses phthisis, which kills them, far from being the closing of their sickness, is but the result of a tuberculization which had had its beginning in diabetes from the start.

It is no less logical, according to the authors, to attribute to inflammatory tuberculosis, quantities of sclerous suprarenalitis, with unknown etiology and which give rise to more or less serious circulatory troubles, to tendency to collapse, arterio-

sclerosis and atheroma, very frequent diseases whose pathology can thus be explained.

To ovarian and testicular cirrhosis, tubercular in nature, are due sterility and numerous cases of abortion. Tuberculosis becomes a principal cause of spontaneous abortion. The important part played by internal genital glands in the phenomena of development, growth of tissues and functions of the various organic apparatus, gives a valuable idea of the numerous mischievous effects of tuberculous infection in its inflammatory form.

From the résumé of their observations, Drs. Poncet and Leriche come to the conclusion that inflammatory tuberculosis is a great cause of glandular disequilibrium and that tuberculosis must always be present in the mind of the clinician.

\* \* \*

ANTISEPTICS IN MINOR SURGERY.—The medical proverb says, "Better prevent than cure," and for this reason asepsy, when it can be applied rigorously, is always better than antisepsy. Still, this method, easy to be resorted to under certain conditions, is not always in others, such as in ordinary and specially in country practice. The use of antiseptics remains then necessary in most instances, if serious accidents, due to the presence of pus in wounds, are not to be expected.

Experimental researches, says Dr. Schwartz in the *Presse Médicale*, have demonstrated that microbial toxins were chemically constituted by alkaline-albumins. If then one wishes to neutralize their action, as long as they are the cause of all accidents, it is necessary to resort to acid substances to realize it. Phenic acid has for a long time been considered as the choice antiseptic, but it has many inconveniences, and in some instances its use is somewhat difficult.

Dr. Schwartz has then resorted to a vegetal antiseptic, that is to say, existing in a natural state and not requiring any chemical preparation. It is the citric acid contained in lemon juice and which has been used for other purposes for years.

For a dressing one takes equal parts of aromatic wine and physiologic serum to which is added a few drops of the juice of a lemon, say from half to one or more, if necessary, and according to the importance of the dressing. A liquid of rosy coloration is thus obtained which gives no pain by its application, leaves no scar and has the following properties: antiputrid, stimulant of the living cells, neutralizing microbial toxins due to pathogenous germs. With this application, and advantageously, the surroundings of the wound can be coated over with tincture of iodine, even in anfractuosités, where it acts as a bactericid.

By a daily application wounds which had no tendency to cicatrization were rapidly modified. After a short time the purulent secretion would subside, the granulations would lose their greyish sanious appearance and assume a good coloration, with a manifest tendency to cicatrization.

The method is very simple and suggests its application in country veterinary practice.

A. L.

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#### VETERINARIANS FROM "THE STATES" PAY A TRIBUTE TO THE MEMORY OF THE LATE PROFESSOR ANDREW SMITH.

As a result of the usual thoughtfulness of our esteemed *confrère*, Dr. W. Horace Hoskins, who has the happy faculty of thinking of the right thing just at the right moment, a number of his more intimate friends in the profession were allowed the privilege of taking part with him in paying a fitting tribute to the memory of Professor Andrew Smith, the pioneer in veterinary education in Canada. While all of the number were not able to accompany their leader to the grave (as the result of acute ailments and other causes), the little group which wended its way from the Prince George Hotel in the early morning of August 24, 1911, carried with them a silent expression from the entire profession from across the border line that Andrew

Smith was not forgotten, and that his name still lives. They proceeded to Mount Peace Cemetery, on the suburbs of Toronto, in carriages, and carried with them a beautiful floral wreath of magnolias, garnished with purple asters, which they placed upon the grave of their departed brother as a material expression of the dictates of their hearts.

Through the courtesy of Dr. R. S. MacKellar, of New York, we have received a photograph of the headstone of the late Dr. Smith, with the group standing on either side of the grave, upon which the wreath rests, Dr. Hoskins being the second one from the stone, on the reader's right. The eight gentlemen in



the group consist of Drs. B. W. Groff, Ohio; J. W. Tooley, Wis.; Otto Faust and R. S. MacKellar, N. Y.; Chas. R. Good, J. W. Sallade, J. H. McCarthy and W. Horace Hoskins, Pa.

A NEW law, which became operative July 1, provides for four veterinary inspectors for the Island of Porto Rico instead of two, as previously. Dr. T. A. Allen, of San Juan, has been appointed chief of the division. It is gratifying to note this activity in the Department of Sanitation of Porto Rico.

## ORIGINAL ARTICLES.

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### BACTERINS AS AN AID IN WOUND HEALING.\*

BY CHAS. H. JEWELL, VETERINARIAN, 6TH FIELD ARTILLERY, UNITED STATES ARMY, FORT RILEY, KAN.

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Nothing since the introduction of antiseptics, by Lister, has been such a boon to the veterinary profession as has that of the discovery and practical use of bacterins in wound healing; at first used for chronic suppurative conditions, but now by many for all suppurative conditions, be they acute or chronic.

This line of work had its origin from the principles founded by Wright in his opsonic theory (that certain substances were produced within the blood to check the ravages of invading germs) and first made use of by practitioners of human medicine, but it fell to the lot of our profession to bring this line of treatment into general and practical use. In this work much credit is due to Drs. Archibald and Kinsley, who were the pioneers of this work among veterinarians; at the same time we must give credit to our commercial firms who early took hold of this line and introduced these products to the profession generally, at a cost which enabled veterinarians to use them freely.

The general opinion among veterinarians is that bacterins are only applicable for chronic suppurative conditions, but I hope to make it plain by this paper that they are equally as effective in the treatment of all wounds which are in all probability infected with pus-producing organisms. In our hospital work we find that we can in most instances save more than half the time, labor and expense of drugs and dressings by treating all infected wounds from the beginning with bacterins. In all

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wounds the first thing necessary is to follow out the old rule, and that is to obtain good free drainage and let bacterins do the work through their increasing the resistance of the animal's system, which is thus fortified against pus-producing organisms. With its use wounds heal without the usual profuse flow of the old-time "laudable pus," and excessive granulation which we always see in this class of wounds is entirely lacking and likewise but little scar tissue remains.

In chronic suppurative conditions bacterins will bring about healing when all other efforts have failed, providing the wound has free drainage and all necrotic tissue or foreign bodies have been removed. If we are careful to do this our cures will be almost miraculous.

In open joints, open tendon sheaths and punctured wounds of the feet it is of great benefit, and the percentage of cures of these serious cases will be greatly increased by its use.

It is interesting to study microscopically the discharge of wounds which have been treated with bacterins. After four or five days under this treatment smears made and stained will show that the discharge is entirely free from pus organisms, and we have made repeated efforts from such cases to obtain cultures, but in most cases the culture medium remains sterile. This, I think, is a good argument in favor of treating all infected wounds with this method.

*A Simple Method of Preparing Bacterins.*—The simplest method in the production of bacterins which will give the desired results is conceded by all to be the best, and the method that we have carried out is the one recommended by Dr. A. T. Kinsley, of the Kansas City Veterinary College, and is as follows:

Make a culture medium of bouillon after the following formula:

Beef extract (Liebig's), 3 gms.

Soluble peptone, 10 gms.

Sodium chloride, chemically pure, .5 gms.

Water, one litre.

Mix and bring to the boiling point for a very short time, say two or three minutes; test to see that it is neutral or slightly alkaline, then filter through ordinary filter paper and divide this in clean, sterile flasks, each containing 100 c.c.; place in a steam sterilizer and bring to the boiling point for fifteen minutes upon three consecutive days. This media is then ready for inoculation with the pus from a suppurating wound not previously treated with bacterins. In inoculating, it is best to sterilize a platinum loop by passing it slowly through a flame several times and then from the depth of the wound take one or two loopfuls of the pus and place within the culture medium. This, after inoculation, should be placed in an incubator and kept at  $38^{\circ}$  C. for forty-eight hours; then it is taken out and placed in a dry sterilizer at  $60^{\circ}$  C. for one hour. Then to each 100 c.c. of this product we add seven or eight drops of carbolic acid to act as a preservative. Now it is ready to be bottled. The most convenient size bottles is 2 and 4 c.c., as this is the usual sized dose for administration. These bottles, with their corks, should be sterilized by subjecting them to dry sterilization at  $160^{\circ}$  C. for one hour. After being filled, seal the ends of the corks by dipping them in melted paraffine wax.

The above method can be accomplished and is by many practicing veterinarians with but little outlay, and it is surprising what can be done in this line by a little ingenuity. One can prepare a tight box for the culture and incubate this by means of a small lighted lamp or electric light, and a wash-boiler can be made into a good substitute for both a dry and steam sterilizer.

The product that you buy from the commercial firms is labeled to contain so many million dead bacterins per c.c.; this sounds very nice, but when it comes down to the practical results it makes no difference so long as we get the desired effect. All that is necessary is to make sure that you have a good growth within the medium, and if grown for forty-eight hours I can assure you the product will be satisfactory.

There are two ways to determine whether the growth within your medium is satisfactory: First, by macroscopical examina-

tion, noting carefully the change which has taken place, and, second, by making a smear and stain and studying this under a microscope, noting the classes of bacterins and their apparent number. The stained preparation in most cases reveal the streptococci in excess of other germs; then next comes the staphylococci and often some forms of bacilli, probably the bacillus pyocyaneus or coli communis; thus the product is in reality a poly bacterin.

Of the autogenous bacterins, or bacterins made from the pus of the animal upon which the product is to be used, I would say that it is only an occasional case where this product is more beneficial than the poly bacterins made in the manner described above. In our work we started with the use of the autogenous only, but after experimenting with the use of bacterins from one animal upon another we found that in most cases our results were just as satisfactory, and now we are using a product made from any animal upon all subsequent cases so long as the product lasts. In this way we make a great saving of time and bacterins.

*Method of Using Bacterins.*—We first inject 2 c.c. hypodermically as soon as we receive a case requiring this line of treatment, and follow this in four days with 4 c.c., and every four days subsequently we inject 2 c.c. until the pus entirely ceases to form, which is usually after the second dose. At all times use antiseptic precaution in making your injection. The seat of injection is usually the skin on either side of the neck.

Often after an injection we get a strong reaction similar to that from mallein, with considerable elevation of temperature and large, painful swelling at the seat of injection. This has been regarded by some as unfavorable and said to lower the resistance rather than raise it, but our experience has been invariably that following these reactions, the wound shows marked improvement immediately. Some might ask if we might not get a good many abscesses following the injection, but to these I would state that we have made many hundred injections without ever having this unfavorable termination.

*The Future of Bacterins.*—I wish to be pardoned if I transgress by wandering a little from the subject, but I consider this point of great importance to us.

This product has been worked upon to some extent as a prophylactic in strangles and other forms of shipping fever, also in canine distemper, and the results, I believe, warrant its further trial.

We used it on two occasions upon the arrival of young animals from the stockyards and the results were highly gratifying. The principle is the same as the vaccination against typhoid fever of man, and this has been proven by its general use in the army as a reliable preventive for this dread disease.

In this connection I wish to bring your attention to a case which I will refer to later in case reports of a horse treated for a punctured wound of the head involving the maxillary sinuses. This animal was treated with bacterins and healed in two weeks' time and later developed a well-marked case of tetanus; the bacterins were continued every four days and this animal passed through the attack without any great amount of discomfort, did not lose much in flesh, and made a complete recovery in a reasonable length of time.

Now, the question arises in my mind, did the bacterins so fortify this animal's system as to enable him to overcome the effects of the poison generated by the tetanus bacilli? Should this be the case this might be a great field for bacterins. I would not wish to pass my opinion upon a single case, but hope others will give it a trial and prove whether my supposition will bear the test of time.

I am firmly of the opinion that the result of this line of treatment is only in its infancy, and I predict a great future for bacterins in the above-mentioned line of veterinary medicines.

In the use of bacterins I would say that this product does not in each and every case produce the same desirable results. I would estimate that in 75 per cent. of the cases the results are most pleasing, but occasionally we may have one that the condition of the animal's system may differ from most others and

the results are not so gratifying. I have yet to see a single case upon which the bacterins were used that we did not get improvement, but this may go on for only a short length of time and then the case come to a standstill. In these cases some recommended nuclein along with the bacterins. I have not tried the combination enough to pass an opinion upon the results, but the theory seems plausible, for we well know that nuclein will increase the white cells of the blood, which are the ones to protect the system from infection.

I submit for your consideration the following case reports, which ought to convince the most skeptical the great benefits derived from the use of bacterins:

#### CASE No. 1.

Mule with a large, lacerated wound on the right buttock, entered on January 19, 1911.

Treatment—Seaton inserted to give drainage from a deep pocket at the bottom of wound.

January 28—2 c.c. of autogenous bacterin injected.

February 2—4 c.c. of autogenous bacterin injected.

Discharged from hospital February 8. Time under treatment, twenty-two days.

#### CASE No. 2.

Mule with deep, punctured wound on left haunch, entered January 30, 1911.

Treatment—Wound opened well and packed with gauze saturated with tincture of iodine.

February 4—2 c.c. of stock bacterin injected.

No further treatment was given this animal. Discharged February 8. Time under treatment, nine days.

#### CASE No. 3.

Mule with deep, punctured wound on right shoulder extending upwards underneath the flexor brachii muscle and dis-

charging a stringy, straw-colored fluid resembling synovia, entered February 9, 1911.

Treatment—February 9—2 c.c. of stock bacterin injected.

February 14—4 c.c. of stock bacterin injected.

Discharged February 18. Time under treatment, nine days.

#### CASE No. 4.

Horse with fistula of the submaxillary lymph glands following distemper, entered February 1, 1911.

Treatment—Swabbed with tincture of iodine for two weeks, with no improvement.

February 15—2 c.c. of autogenous bacterin injected.

February 20—4 c.c. of autogenous bacterin injected.

Discharged on February 25. Time under treatment, twenty-five days.

#### CASE No. 5.

Mare with kick on outside of right elbow joint, entered July 16, 1910.

Treatment—Hot and cold irrigations, followed with white lotion.

August 4—Wound opened and iodine pack used.

August 5—Discharge of synovia from the wound.

August 10—2 c.c. of autogenous bacterin injected.

August 13—2 c.c. of autogenous bacterin injected.

August 17—2 c.c. of autogenous bacterin injected.

Discharged August 21. Time under treatment, thirty-six days.

#### CASE No. 6.

Cavalry horse with a large, phlegmonous swelling upon the left shoulder extending from a punctured wound near the top of the shoulder to the pectoral muscles and back to the caput muscles. This swelling crepitated upon a pressure, showing that the infection was a gas-producing organism similar to "Welches bacillus." The effected parts sloughed and the skin was loosened over the entire area. At a point above the shoulder

joint a large slough took place which was about ten inches long by six inches wide. This case was entered on January 8, 1911.

Treatment—The pockets formed were opened and drained by means of seatons and all the necrotic tissue removed.

January 14—2 c.c. of autogenous bacterin injected.

January 19—4 c.c. of autogenous bacterin injected.

January 24—2 c.c. of autogenous bacterin injected.

January 28—2 c.c. of autogenous bacterin injected.

Discharged on March 20. Time under treatment, seventy-one days.

No excessive granulations filled the wound and after February 2 the only dressing used was olive oil and creolin to keep the parts soft.

#### CASE No. 7.

Mare with bruise on left haunch about 10 inches in diameter which filled with a collection of serum; entered February 15, 1911.

Treatment—Drained antiseptically and blistered, but did not fully absorb.

February 23—Wound laid freely open and 2 c.c. of stock bacterin injected.

February 27—4 c.c. of stock bacterin injected.

March 4—2 c.c. of stock bacterin injected.

March 10—2 c.c. of stock bacterin injected.

Discharged March 10. Time under treatment, twenty-three days.

#### CASE No. 8.

Cavalry horse with punctured wound of the face which entered the frontal sinus, and upon examination several pieces of broken bone were found; entered April 3, 1911.

Treatment—All detached parts of bone removed; irrigations daily with warm water.

April 6—2 c.c. of stock bacterin injected.

April 11—4 c.c. of stock bacterin injected.

April 16—2 c.c. of stock bacterin injected.

April 22—2 c.c. of stock bacterin injected.

April 26—2 c.c. of stock bacterin injected.

April 29—2 c.c. of stock bacterin injected.

Discharged May 3. Time under treatment, thirty days.

#### CASE NO. 9.

Cavalry horse with kick on right hock, wound badly infected; entered April 26, 1911.

Treatment—Biniodide mercury blister.

April 26—2 c.c. of stock bacterin injected.

Discharged May 4. Time under treatment, eight days.

#### CASE NO. 10.

A cavalry horse with a bad tear of the skin between the eyes and a bad puncture involving the bone. The skin tear was about five inches long. Entered April 24, 1911.

Treatment—Washed with antiseptics and sutured, requiring eleven stitches to close the wound. Dusted with iodoform powder and covered with collodion.

April 24—2 c.c. of stock bacterin injected.

April 29—4 c.c. of stock bacterin injected.

May 5—2 c.c. of stock bacterin injected.

May 7—2 c.c. of stock bacterin injected.

May 10—Suture removed. Discharged May 11. Time under treatment, seventeen days. During treatment no pus appeared upon this wound and it received no dressing whatever.

#### CASE NO. 11.

A cavalry horse with a deep-punctured wound below the left eye, entering the superior maxillary sinus, which upon examination showed that the bone was badly splintered; entered March 19, 1911.

Treatment—On March 25 the animal was cast and a large piece of bone removed from the seat of the wound, the inferior maxillary sinus opened, and the partition separating the sinuses broken through to allow the drainage. There was a collection

of pus within the sinuses and a profuse nasal discharge from that side.

March 26—2 c.c. of autogenous bacterin injected.

March 30—4 c.c. of autogenous bacterin injected.

April 3—2 c.c. of autogenous bacterin injected.

On April 4 the wound was entirely healed and on this date tetanus symptoms developed, and as an experiment bacterins were continued.

April 13—3 c.c. of stock bacterin injected.

April 17—3 c.c. of stock bacterin injected.

April 21—3 c.c. of stock bacterin injected.

April 25—3 c.c. of stock bacterin injected.

During this time the animal was given four ounces of potassium bromide daily until May 13, when this was discontinued, as the horse was well on the road to recovery. Discharged May 30. Time under treatment, seventy-six days. This animal did so well under the bacterin treatment that it seems as though there must have been a marked benefit derived from its use, and this may be one of the future indications for the use of bacterins.

#### CASE NO. 12.

A bay horse afflicted with fistulous withers was brought to our hospital on September 9, 1910. This animal belonged to a farmer living near the post.

Treatment—Free openings made and good drainage obtained by the use of seatons smeared with biniodide mercury blister and the wound kept clean with plain water.

September 29—2 c.c. of autogenous bacterin injected.

October 3—4 c.c. of autogenous bacterin injected.

October 10—Another abscess formed and was drained as before.

October 19—2 c.c. of autogenous bacterin injected.

October 24—2 c.c. of autogenous bacterin injected.

October 30—Animal was brought back for examination and the wounds were entirely healed with but a small amount of scar tissue, and at the present time this animal remains perfectly

sound. One would have to look closely to find any scars about the seat of operation.

This cure in so short a time seems remarkable on account of the fact that no antiseptic precautions were used in dressing, since the case was taken care of by the farmer himself and returned only for injections. The time of the treatment of this animal was forty-five days.

### CASE No. 13.

A pony with a nail puncture, right hind foot, entered May 2, 1911.

Treatment—The wound was opened up and dressed with pure creolin. On the second day a profuse discharge of synovia flowed from the wound.

May 3—2 c.c. of stock bacterin was injected and the foot soaked in bichloride solution, 1 to 1,000.

May 7—4 c.c. of stock bacterin was injected, and in the meantime the soaking with bichloride was continued.

May 15—The wound was dry and a dressing of tar and oakum used.

May 20—The animal was placed in a soaking stall and this was continued until June 4, and exercise was prescribed for the animal. Discharged June 19, practically as well as ever. Time under treatment, thirty-seven days.

### SUMMARY.

1. Bacterins have proven themselves equally as useful in recent suppurative conditions as chronic ones.

2. By their use the profuse discharge of pus from all suppurative conditions quickly ceases.

3. Without good drainage and the removal of any foreign bodies or necrotic tissue we cannot expect healing to take place even with bacterins.

4. With their use we generally get no excessive granulations or large amount of scar tissue.

5. Bacterins save time, labor and antiseptics in the treatment of infected wounds.

6. On account of the increased resistance of the animal's system they are bound to be a factor in the future as an immunizing and curative agent for many of the contagious diseases of animals.

In this work I wish to give credit to Dr. Alexander Plummer, Veterinarian, 4th United States Cavalry, who is stationed with me at the Mounted Service School at Fort Riley, Kansas, and has been my co-worker during the time that this work was carried on; also to Dr. A. T. Kinsley, who has cheerfully aided us at all times upon matters pertaining to this subject.

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IMPORTANT NOTICE TO SECRETARIES OF VETERINARY ASSOCIATIONS.—The REVIEW has for years given up a page of its space for the posting of notices of dates and places of meetings, but cannot post said notices unless secretaries will furnish them.

Please give this your *immediate attention*—if you desire the co-operation of the REVIEW in getting out a *full attendance at your next meeting*.

THE little instrument devised by Dr. J. H. Blattenburg, of Lima, Ohio, which has proven to be such a material aid in the "Williams" operation for roaring, as demonstrated at the national convention at Toronto in August, and at the meeting of the New York State Veterinary Medical Society at Brooklyn in September, has aroused considerable interest among veterinarians throughout the country, who seem to think that through the assistance of this little instrument, the operation is likely to be performed by a great many practitioners who have thought it too difficult for them to undertake before the advent of Dr. Blattenburg's "burr," which has simplified the technique. Consequently Dr. Blattenburg has been flooded with letters of inquiry in regard to the instrument—cost, where to procure it, etc., and the doctor desires to say to the profession through the medium of the REVIEW that he has no intention of manufacturing the instrument, now or at any other time, but that if it receives the stamp of approval of the profession and is considered as one of the necessary instruments for the performance of the "Williams" operation for roaring in the best and most expeditious manner, it will, no doubt, be placed on the market by one of the veterinary instrument houses in the near future.

## NEWER THERAPEUTIC AGENTS.\*

BY PIERRE A. FISH, ITHACA, N. Y.

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Until the matter is investigated, it is difficult to conceive how much work is being done in the production of new remedies. According to *Merck's Report* the number of new remedies appearing in 1906 was 96; in 1907, 85; in 1909, 67; in 1910, 75. For the four years mentioned the average would be about 80 per year. This means the appearance of six or seven new remedies each month.

Occasionally a new remedy is of importance and acquires permanent use. The majority at the same or greater cost, are no more, and perhaps even less efficient than the established remedies and are therefore soon forgotten. In many instances the basis of a number of new remedies is the same substance in combination with different substances, but with a new or modified name for each compound. Some of the basal substances thus used for new compounds are: formaldehyde, salicylic, citric, acetic and tannic acids; arsenic, quinine and various others. Thus many of the new remedies are old ones disguised under various combinations.

The greater number of new remedies originate in foreign countries and may have come into more or less general use there before being taken up in this country. Although the great majority of these remedies are intended for human practice some of them are equally practicable for veterinary use. Others equally practicable but higher in cost are prohibitive on that account because of the larger dosage required for the domesticated animals.

Although the title of this paper refers to newer therapeutic agents, it is believed that an occasional reference to a new thera-

\* Read at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911

peutic use of an old drug is equally interesting and important and a few such will therefore be included.

*Acetone-Alcohol*.—This preparation is used to disinfect the skin before operation. Equal parts of acetone and 95 per cent. alcohol are used, or in some cases, one part of acetone and two of alcohol. This mixture removes the bacteria on the surface. The area is then rubbed over with dilute tincture of benzoin to safeguard against the deep-seated bacteria. The action of the mixture depends in part upon the alcohol, but the action is converted into a durable one by the acetone, which is a powerful solvent of fats. Acetone is superior to ether, benzine, etc., because it has greater power of extracting water.

*Acidum Nucleinicum* (obtained from yeast).—V. Milulic and Miyake have drawn attention to the fact that nucleinic acid is a valuable therapeutic agent especially in laparotomies. Subcutaneous injections apparently have the property of increasing the resistance of the peritoneum to bacteria. It increases leucocytosis considerably and raises twenty-fold the resisting power of the peritoneum. For this purpose a 2 per cent. neutralized solution is injected 12 hours before the operation. Solutions of sodium nucleinate give the same results. According to Pollak nuclein has the same action as nucleinic acid.

*Afermol* is the name applied to the dry and powdered serum obtained from the blood of the horse. It has been recommended as a dusting powder in purulent wounds.

*Bacterins or Bacterial Vaccines*.—Although quite recent, bacterins have come into quite extended use. They consist of suspensions of killed pathogenic bacteria in normal saline solution, standardized by determining the number of bacteria per cubic centimeter of suspension. The term bacterin has been proposed to replace bacterial vaccine as it is believed by some that vaccine more properly refers to virus derived from the bovines.

By the use of bacterins the opsonins and other antibodies in the blood may be increased and, other things being equal, this increase is characterized clinically by improvement in the patient's condition. When a bacterin is injected into the tissues of a

patient suffering from an infection of the corresponding live germ, the formation of the special opsonin having the power of preparing that germ for phagocytosis is stimulated. The blood and lymph thus enriched, circulating through the focus of infection, prepare the invading germ for destruction by the phagocytes. Bacterial therapy is therefore dependent upon the injection of an appropriate bacterin and the flushing of the focus of invasion by the enriched blood and lymph.

Bacterins are prepared either from germs cultivated in the laboratory, or directly from germs isolated from the patient. In the former case they are known as stock bacterins; in the latter as autogenous bacterins. It is reported that stock bacterins have been found equal to and sometimes superior to autogenous vaccines in the treatment of certain infections.

*Basedowian.*—Although not used in veterinary practice this agent is referred to because it is obtained from domesticated animals. It is a serum obtained from the blood of goats and sheep from which the thyroid gland has been extirpated. It contains 0.5 per cent. of carbolic acid as a preservative, and is used in Basedow's disease (exophthalmic goiter, internally and by hypodermic injection.

*Camphora.*—Very favorable results are reported in veterinary practice by Becker concerning the use of camphor in the treatment of purpura hemorrhagica (morbus maculosus). In addition to local treatment, pills were prescribed consisting of 75 grains of camphor, 1 2-3 oz. of common salt and the required amount of flour and water. In three severe cases it was found that three pills a day proved sufficient to cause the swelling to subside after a few days and to increase the desire for food.

*Chromil Sulphas.*—Kolpinski has pointed out the therapeutic value of this drug. It is said that it appears to be more useful in conditions in which there is fibrosis or degeneration of tissue, secondary to changes in the spinal cord. It is assumed that it affects the trophic centers of the body—those which regulate the nutrition of nerves and through them the various vital

organs. In human practice it is recommended in neurasthenia, locomotor ataxia, exophthalmic goiter, enlarged prostate, chronic nephritis, impotency, chorea migraine, sciatica and uterine fibroid. It is apparently a non-toxic preparation and may therefore be given in rather large doses. Its action would seem to class it with the alteratives, as its effects are gradual and treatment should extend over some little time, although some rather prompt results are reported. It would seem to be indicated especially in chorea in the dog and it doubtless will be found to have other applications in veterinary practice.

*Cocainæ Hydrochloridum.*—Although this agent has long been used for the production of local anæsthesia, C. Ritter has shown that intravenous injections of cocaine hydrochloride in the dog gave rise to total anæsthesia. With small dogs he used about 10 c.c. of a 1 per cent. solution and with large dogs 5 c.c. of a 3 per cent. to 5 per cent. solution in 0.10 per cent. normal saline solution. The dog remains fully awake, moves his eyes and head; the eyes are open and react to the slightest stimulus. The pupils are dilated. The respiration becomes quiet, regular and usually slightly accelerated. Sensibility to pain disappears after two to five minutes. While an animal that has not been cocainized suffers great pain from the application of a clamp or the contact of a thermocautery, the cocainized animal does not react to these stimuli except that perhaps a single contraction of the muscles may be observed. The duration of the anæsthesia is variable, in some cases it lasts only fifteen minutes, in others half an hour or more.

Weaker solutions abolish the susceptibility to pain but the sensibility to touch is retained. In a few cases only were unpleasant secondary results observed. It was found that on repeated cocainization the cocaine action lost its intensity.

*Cupri Sulphas.*—The fact that copper sulphate acts unfavorably upon the lower fungi and algæ has led to its therapeutic use in actinomycosis. Bevan obtained very satisfactory results from its internal and external use in a case of actinomycosis of the abdominal cavity. In this case neither operation nor potas-

sium iodide, nor the use of radium, had proved of any material benefit.

*Echinacca Augustifolia*.—In some sections this drug has come into quite extensive use in veterinary practice. It is reported that its use in some apparently hopeless cases in horses and cattle has been attended with successful results. It is a non-toxic drug—as much as four ounces of the powder have been administered to a cow in single doses. It is especially indicated where the quality of the blood is not up to the proper standard and in some ways may be classed with the alteratives as to its action.

*Fibrolysin*.—This is a sterilized 15 per cent. solution of a double salt of *thiosinamine* (two molecules) and *sodium salicylate* (one molecule), introduced by F. Mendel as a succedaneum to thiosinamin, hypodermically. Kratzer reported a favorable result from the use of fibrolysin in a horse suffering from tendonitis fibrosa. This led to further trials in veterinary practice. Ralme used fibrolysin in an apparently hopeless case of sclerosis in a horse. According to his report five subcutaneous injections applied within eleven days led to a surprisingly good result. The horse was cured except for a slight thickening of the flexor tendons of the hock and was completely restored to its working capacity. Train in two particular cases was able to cure horses after two injections. In tumor fibrosus in an ox, three injections were found to have an excellent action. Remarkable results from the use of fibrolysin in tendonitis fibrosa, tenosynovitis and elephantiasis are reported by Oppenheim, Joelink and Gottschalk. The doses for horses and cattle are 10 c.c. (or an ampulla containing 11.5 c.c.) into the neck of the animal. The injections are best given subcutaneously every two days. Intravenous and intramuscular injections may also be used.

*Formaldehyde*.—H. Lomas used formaldehyde in veterinary practice in the form of intravenous injections. In horses with hemorrhagic rash he gave single doses of 3 drams of formaldehyde (40 per cent.) diluted with  $2/3$  to  $2\frac{1}{2}$  ounces of water. In the cases thus treated recovery took place without unfavorable results.

*Gallogen*.—Under the name of gallogen, ellagic acid was issued a few years ago for therapeutic use. It is a by-product of the manufacture of gallic acid and contains tannin.

Kunneman used the preparation with success in domestic animals, especially in the contagious diarrhoea of dogs, in which a single dose usually produced marked improvement, and three or four doses cured the trouble. As a suitable dose for dogs and cats the author recommends 8 to 30 grains, for medium-sized domestic animals 75 to 225 grains, and for large domestic animals  $\frac{1}{2}$  to 1 ounce.

*Hordein Sulphate*.—Hordein or its sulphate was first prepared by Leger. It has been stated that when given in mixtures or subcutaneously it acts as a cardiac tonic by diminishing the systolic energy of the heart. It has also been found of good service in entero-colitis, dysentery, gastric stasis and hypersecretion.

*Horsine* is a fanciful name given to a muscle plasm or juice from the horse. It is said to be exploited in France as a remedy for use in tuberculosis.

*Iodipin*.—This is an iodine addition product of the fatty acids of sesame oil. Diffine tried iodipin (25 per cent.) in three cases of severe traumatic tetanus in horses. He began by giving subcutaneous injections of 1 to 3 ounces every three days. After three of these injections improvement set in; he then injected  $\frac{5}{6}$  ounce every fifth day and later every eighth day, until a complete cure was obtained after four to five weeks. In purpura hemorrhagica he obtained better and more rapid results with iodipin than with any other remedy. Iodipin was found to be useful also in broken wind of horses, parenchymatous inflammation of the udders of cows, actinomycosis and severe glanders. Additional reports give as indications for iodipin: acute endocarditis, asthma, influenza, pneumonia, bronchitis, hemoglobinemia, cirrhosis of the liver, hepatic staggers, lumbago, distemper, tuberculosis, galls, cellulitis, abscesses, extravasation of lymph, painful external swellings, malleanders, boils, tinea tonsurans, as well as external injuries and wounds.

Regarding the dosage and method of applying iodipin for veterinary purposes, the 10 per cent. preparation is more suitable for small animals, but this, as well as the 25 per cent. iodipin are recommended for internal administration (1 to 3 tablespoonfuls a day). Of the 10 per cent. preparation 1 to 5 teaspoonfuls should be given daily, according to the size and weight of the animal. This does not cause any loss of appetite or any disturbance of digestion. The preparation is well tolerated and sign of iodism are practically never seen.

For subcutaneous injection only the 25 per cent. preparation should be used. Fifty grams (1 p/3 ounce) may be injected at a time into the subcutaneous cellular tissue. The preparation is said to be harmless and not much caution is required as regards dosage. Iodipin should be warmed before use by dipping the original bottle into hot water.

*Perhydrol*.—This is a 30 per cent. (by weight) solution of hydrogen peroxide. It is said to be chemically pure and free from acidity. These factors are believed to increase its harmlessness and to facilitate the general use of the preparation.

Zimmerman, Porcher, Guenther and Holzmayer have reported excellent results with perhydrol as an antiseptic for wounds in veterinary practice. Not only recent cuts, tears, pricks and bites but also more or less neglected wounds may be thoroughly cleansed in a few minutes by means of a solution of 3 per cent. perhydrol. It has a particularly beneficial action in suppurating and gangrenous processes; the mechanical effect of the evolution of oxygen is a decided aid to its action. In otitis externa in the dog it is recommended in 10 per cent. to 30 per cent. solution. Moist eczema may be treated with pure perhydrol or with perhydrol glycerine. It is also recommended in stomatitis and ulcerative stomatitis of dogs and horses. As an eye wash, in a 0.5 per cent. to 1 per cent. solution, perhydrol is recommended in traumatic corneal ulcer, conjunctivitis and capillary hemorrhage. Internally, Holzmayer gave it to a dog with distemper (1 tablespoonful of a 1 per cent. solution every two hours) with very good effect. Oppenheim has suggested that if applied as soon

as possible to dog bites, either by itself or with potassium permanganate, it would free the wound from virus and so prevent an outbreak of rabies.

*Radium.*—In the AMERICAN VETERINARY REVIEW, Dr. Liautard has called attention to some interesting experiments by Dr. G. Petit on the injection of radium sulphate in the jugular vein of an aged but healthy horse. The dose administered was 1 milligram (1/67 grain). About eight months later a similar dose was administered. The radium was in an insoluble form and was suspended in 250 c.c. of physiological serum. The effect was harmless. A certain proportion of the radium was eliminated from the body, but an examination six months later showed that there was still some radium in the body. A favorable effect was noted upon the nutrition and general condition. The weight increased from 380 to 410 kilograms (836 to 902 pounds), although it is possible that other factors may have contributed to this. The number of red corpuscles was also increased. It was believed that the injection of this insoluble salt of radium imparted a permanent radio-activity to the blood and therefore to the whole organism. In addition to the emanations from the blood, it was believed that emanations also occurred from particles of radium fixed in the tissues, especially the lungs, and that the continued emanation exerted an effect upon the tissues—in this case a beneficial one. That the serum from an animal thus made radio-active may have therapeutic uses is a possibility. Further research and reports will be awaited with interest.

Radio-active muds have also been experimented with for therapeutic use. They have a very complex composition and appear as a soft reddish paste of the consistency of butter or soft clay. They may be applied as plasters or suspended in water and used as baths, either general or local. The experiments thus far indicate that they are of therapeutic use in eczema in dogs; in dynamic conditions and to promote convalescence. In horses, used either as baths or local application, the muds have been tried in arthritic conditions, sprains, lymphangitis, common scratches,

etc. The use of radium in veterinary practice is new and additional information will be welcomed.

*Serum Leucocygenic* (Raymond Petit).—This preparation is described as a horse serum subjected to a certain treatment to render it stable, introduced by the Pasteur Institute at Paris and marketed in liquid as well as in powder form. It is maintained that injections of the serum cause a great migration of leucocytes to the site of injection. The leucocytes oppose the entrance of microbes by virtue of the phagocytosis they produce. This action is made use of in removing the pus foci in markedly infected wounds and the like. According to Dellet, the serum in certain diseases brings about a disappearance of the general symptoms of infection, reduces temperature, slows the pulse, heals up the wounds and often wards off a fatal termination.

*Yohimbine*.—This alkaloid is recommended as an aphrodisiac and as a remedy for impotence. Strubell's experiments show that the cause of the action of yohimbine is to be found in the increased metabolism of the central nervous system. This increased activity in the exhausted nerve centers has the effect of stimulating the potency which remains, supposing some part of the tissues of the center for erection to remain functional.

Daels ascertained that in sexually mature animals rut is not only called forth by yohimbine, but may be increased to a hemorrhagic discharge, and that these appearances are not abolished by ovariectomy. This action is not obtained with animals which are not sexually mature or with those which have foaled within the month. Holterbach reports a case of a cow, rendered sterile by chronic metritis which was cured by the administration of yohimbine.

The doses are: for the horse,  $\frac{5}{6}$  grain, thrice daily; bulls,  $1\frac{1}{4}$  grains, thrice daily; cows,  $1\frac{1}{2}$  grains, thrice daily; man,  $\frac{1}{12}$  grain, three or four times a day.

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TWO HUNDRED AND FORTY-SEVEN new members were added to the American Veterinary Medical Association at the Toronto meeting: coming from thirty-four States, the District of Columbia, and six Canadian Provinces.

## THE SIGNIFICANCE OF MEAT INSPECTION TO THE PUBLIC AT LARGE.

BY F. R. COMBER, B.A., M.D.C., FORT ATKINSON, WIS.

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There is no more vital question confronting the American people of to-day than the significance of meat inspection to the people at large.

Are you not impressed with the magnitude of it, when you are told that, according to government statistics, about fourteen billion pounds of meat was consumed in the United States last year; in other words, about 186 pounds per capita?

It is calculated that meat constitutes about 30 per cent. of the total nutritive material and costs about 30 per cent. of the total food ration.

Meat animals are subject to many diseases which impair or destroy the wholesomeness of their meat for human food; but the presence or the effects of disease are not always discernible in the dressed carcass.

A piece of meat may carry the micro-organisms of a dangerous disease without giving any indication of the fact to the consumer.

To detect disease there should be an expert inspection at the time of slaughter.

To protect the people at a point where they are unable to protect themselves is, generally speaking, the object of Federal meat inspection.

Diseased meat is the direct cause of disease in those who eat it. The consumer being unable to determine whether or not the meat he purchases is diseased demands that he be protected by the Government.

Since the time of Moses the necessity of an official meat inspection has been recognized, and meat inspection legislation has more or less kept abreast of increasing knowledge in the domain of veterinary medicine that sanitarians demand, and is the most stringent and far-reaching of existing laws on the subject.

The law of June 30, 1906, provides for an annual appropriation of \$3,000,000 to pay the cost of inspection; this enables the Department to greatly extend and strengthen the meat inspection service.

The law applies only to cattle, sheep, swine and goats and to the carcasses and meat products of these animals. Meat inspection under this law proceeds by logical steps. Meats and meat food products, except those from farmers, retail butchers and retail dealers, cannot be shipped from one state to another or abroad unless they bear the official meat inspection marks.

A person or firm desiring to make shipments must therefore make application to the Department for inspection, stating the extent and character of the business to be done. The Department, as directed by law, sends its experts in sanitation who make their report to the Washington office.

Now, in regard to post-mortem inspection. At the first exposure of the lymph glands when the head is severed they are cut into, as these are the common seat of tubercular infection.

Another inspector stands at the elbow of the trough and as the viscera are revealed watches with practiced eye for anything abnormal; carefully examining and handling the various parts, in order that any obscure indication of disease may be discovered.

The Bureau of Animal Industry requires this inspector to handle the viscera, and, if necessary, cut into them. This is rapid and exacting work in the large slaughter houses and when the inspector finds a suspicious carcass he places a tag on it bearing the words "U. S. retained." This goes to the retaining room for a thorough examination by the final inspector.

If the final inspector finds the carcass is fit for food he takes off the "U. S. retained" tag and stamps the carcass "U. S. inspected and passed."

If the carcass is found unfit for food it is tagged "U. S. inspected and condemned." This goes to a tank which is provided by each house for all condemned carcasses. About 25 per cent. of the carcasses that are retained are tanked.

After the carcasses have been removed from the retaining room the walls and floors are disinfected in order that the room may be free from disease infection for the next batch of retained carcasses.

Returning to the killing floor the carcasses which are found healthy are stamped "U. S. inspected and passed," with the number of the house, so that any carcass may be traced back to the house it came from.

The sides now pass to a chill room held at 36 degrees Fahrenheit for forty-eight hours or more before being further dealt with. The head, tail, caul and liver are removed to other parts of the house; and, in fact, everything is made use of but the squeal in hogs.

Some explanation is necessary in reference to the word disease as it is used in meat inspection; as it differs from the generally accepted idea. To the popular mind the thought of eating meat of a slightly diseased animal is abhorrent. Yet it may be stated on the most eminent medical authority that not a single animal used for food in any part of the world would, upon microscopic examination be shown to be absolutely free from all infection and lesion.

From the standpoint of meat inspection, however, the meat of a great majority of animals is not considered diseased. Some slight infections are common to food producing animals, but there is no proof that they do in the remotest degree depreciate the value of the meat, or that the infection is transmitted to man.

For instance, a tubercular nodule may be located in the lungs or some other organ; such nodule would make the

particular point infected diseased, but from the standpoint of meat inspection the carcass would not be considered diseased but only the part.

It follows that the inspector in judging whether the carcass is diseased or not does so on the general principles of pathology and bacteriology and not on any exaggerated or sentimental idea.

The following is a list of the diseases for which animals are condemned: Anthrax, black leg, hemorrhagic septsemia, pyemia, rabies, tetanus, hog cholera and swine plague when generalized, actinomycosis or lumpy jaw when generalized, tuberculosis when generalized.

All emaciated animals and carcasses of animals too immature to produce good, wholesome meat; in other words, anything under three weeks of age shall be condemned. All animals that are in a dying condition in abattoir pens and all that have been allowed to pass into the scalding vat alive shall be condemned.

Now, in regard to tanking condemned meat. The law orders the Secretary of Agriculture to destroy all carcasses which are found unfit for food. All large establishments provide tanks for this purpose, as in this way the grease may be saved for soap and the remainder for fertilizer.

Tanks vary in size with the size of the establishment and the volume of business done. The tanks are of metal and extend through two or more floors of the house. From the nature of their usage they must of necessity be very strong and tight.

Government inspectors first seal the lower opening of the tank; they then see that condemned carcasses with the refuse are put into it, and then the inspector closes and seals the draw of valves. Steam is then turned into the tank and the Government requires that it be maintained at a certain pressure for a prescribed time. A temperature of 280 degrees Fahrenheit is maintained for ten hours, which is sufficient to liberate all the grease and even to disintegrate the bones.

Inspectors watch the drawing off process, which is done by means of valves located at intervals along the sides of the tank, and all containers in which the product is stored is marked inedible.

All possible precautions are made to prevent this product from being sold as lard.

A word in regard to the Federal meat inspectors. The men in charge of all stations where slaughtering is done are veterinarians. These men must first have completed a three years' course in a reputable veterinary college. The Bureau of Animal Industry recognizes only fourteen such institutions in the United States, and there are several others who aspire to cover this field of knowledge. The Civil Service Commission examines these graduates and about 50 per cent. of those examined make the required grade.

When admitted to the service an inspector is placed on probation for six months. If at the end of this time he attains his permanent appointment he is placed under experienced inspectors that he may learn the regulations and methods of their application.

The Department demands all the inspector's time during the working day and a man must be slow, indeed, if in the days, months and years spent amid the swift work of the killing floors he fails to develop the most masterly dexterity in discovering abnormalities in the carcasses that come before him.

The laboratory inspectors constitute another class of employees; they are selected through civil service examination in the principles of bacteriology and chemistry with special application to meats and meat food products. Indeed, it is hoped that the foregoing description of the operation of the Federal meat inspection law has shown its limitations and the consequent necessity that it be supplemented by state and municipal inspection.

It may with reason be supposed that the local slaughter house needs inspection even more so than the small plants now under Federal supervision. Again, if the butcher happens to be

located in a town where inspected houses are situated or near such town or city it is not unreasonable to suppose that sellers having suspicious looking animals will send them to him rather than to the inspected houses where they must run the gauntlet of expert examination and at the risk of reaching the offal tank.

Now, in regard to meat inspection in European countries. In England it is an offense punishable by law to sell unwholesome meat, knowing it to be such. In general they employ medical officers of health to examine at any reasonable time any carcass or meat on sale for human food. If such carcass is found to be diseased it may be brought before a justice, who may order it destroyed.

Now, in regard to Scotland. The Scotch public health act is more specific, for it provides for inspection by veterinarians, both ante-mortem and post-mortem inspection; and inasmuch as that country is well supplied with public abattoirs under municipal ownership and control the meat inspection system of that country more nearly approaches our own, although without our system of marking.

In France the meat inspection service at present is under the supervision of the Minister of Agriculture.

The municipal authorities also issue special regulations which have as their object the total or partial seizure of unwholesome meats or the exclusion from abattoirs of animals unfit for food.

Inspection in private abattoirs or slaughtering houses is not practiced generally in France, only four departments having made any efforts in this direction, and in these it does not come up to the standard maintained in public abattoirs.

Now in regard to Germany. Of all the meat inspection systems of European countries, Germany is the most elaborate, and it is sufficient to say in describing it that the system very closely resembles our own in the way it is operated.

In Germany the tuberculin test shows 15 to 25 per cent. of the cattle to be tuberculous; in this country from 3 to 8 per cent. of the cattle are infected according to government statistics.

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The wide variation in the figures in both cases is due to the fact that different localities are differently affected.

In the United States the older and more thickly populated portions are the most affected.

Tuberculosis among cattle running wild on extensive prairies is rare, but when the animals are kept in barns, crowded and subjected to stable feeding, it becomes very common.

It reaches its highest percentage among milch cows, which are often kept under the most unnatural and unhygienic conditions.

There are cases on record where from 50 to 80 per cent. of a herd of milch cows have been found affected.

Now, in conclusion, to provide clean, healthful, wholesome meat for the rich and poor alike, is one of the problems of our modern civilization.

Would that we could raise the standard of education and investigation along these lines to a higher plane, and spend more money in the interest of science, whereby we could extend the average length of life many years.

Then do you not one and all come to the logical conclusion that federal meat inspection is of vital importance, and to do the greatest good for the largest number for the longest time is what the government is aiming at, and it is a cause which merits the co-operation of us all.

And let us ever remember, as did the far-famed men of letters:

That the tissue of life to be  
We weave with colors all our own  
And in the field of destiny  
We reap as we have sown.

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It is frequently said that "veterinary medicine is in its infancy." Anyone peeping into Steeplechase Park, Coney Island, on the evening of September 14, might be excused if they applied the same to veterinarians.

## THE PLACE OF PATHOLOGY IN THE VETERINARY CURRICULUM.\*

BY SAMUEL HOWARD BURNETT, NEW YORK STATE VETERINARY COLLEGE,  
ITHACA, N. Y.

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The relation of the several subjects forming the veterinary curriculum is a topic that is exciting more thought each year. It is not to be expected that we are ready to agree as to how much time shall be devoted to each subject. This probably will always be a debatable question. But thoughtful study and discussion of the matter cannot fail to exert a powerful influence in our teaching and bear fruit as time goes on. As a result, more efficient and capable veterinarians will each year be leaving the schools and entering the active practice of their profession. I do not think that this association should determine just how much time should be given to each subject taught, even if we could all agree. That must be decided by the faculty of each college. It is a domestic problem, as it were. But it is proper and fitting that this association consider the correlation and the proportional value of the subjects taught. This is the place to discuss and to determine these. It may be that each person here would feel some diffidence about telling a colleague in a faculty meeting that his subject was not of sufficient value to justify the time given it; but here a discussion would be entirely impersonal. It is easy to separate the subjects taught from the men who teach them. After the proportional value of the several subjects is determined, it will be comparatively easy for any faculty to decide how much time shall be devoted to each.

It is not my expectation to give the solution of this large problem. I propose to discuss one part of it. The discussion

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\* Presented at the Association of Faculties and Examining Boards, Toronto, August 24, 1911.

must necessarily involve the entire subject to a certain extent. If it should be of help to anyone to clear his thoughts, whether in agreement with mine or not, it will be a distinct advantage and the trouble of preparing this paper fully repaid. The topic I wish to discuss is the place pathology has in the educational scheme, but before taking that up it is necessary to consider in general the subjects taught and the order in which these should be presented.

The veterinary curriculum is composed of subjects that do not have exactly the same status nor are they of equal importance. Physics, chemistry and biology are preparatory sciences. Anatomy, physiology, pharmacology and pathology may be considered the fundamental sciences proper. Finally, there are the applied subjects, medicine, surgery and therapeutics. It is important to bear in mind that these three subjects are not sciences. The science in surgery is the anatomy and pathology involved. In medicine it is physiology and pathology; in therapeutics it is pharmacology and pathology.

These subjects, medicine, surgery and therapeutics, are supported by an arch, whose more important stones are anatomy, physiology, pharmacology and pathology. Of this supporting arch pathology is the keystone. When I said that all the subjects in the curriculum are not of equal importance, I did not mean that certain of the subjects are unimportant. For example, physics is generally considered one of the lesser subjects. It is not so important as physiology; but what kind of a veterinarian do you suppose a man would make who has no knowledge of physics? So with chemistry. Both are indispensable subjects, yet neither is so important as physiology or anatomy.

Chemistry should be a much more valuable subject than it is. Perhaps in the not distant future we shall know more of the chemical changes that are taking place in the animal body. When we do, chemistry will be entitled to a larger share of time than it now deserves.

Anatomy is acknowledged to be one of the more important subjects. If we judge by the time devoted to it, it must be con-

sidered the most important subject a veterinary student has to study. A surgeon needs a very definite knowledge of anatomy. A physician needs a general knowledge of the structure of the body and somewhat more definite knowledge of certain parts; for example, the internal organs. Whether a detailed knowledge of every bone, muscle, vein and artery is usable knowledge for a physician I have grave doubts. I do not know exactly what proportion of the average practitioner's cases are surgical; rather small, I should say. What the physician needs is not so much to have details of anatomical structure as a thorough knowledge of the function and action of the several parts of the body. Physiology is a much more valuable subject to him. Did you ever think why it is that an experienced man is a better practitioner than one newly graduated? Is it not in large measure that in getting experience, as we say, he has been adding to his working knowledge of physiology and physiological pathology? The student devotes about one-half the time to physiology that he does to anatomy. I hope no one will think that I advocate giving at once more time to the study of physiology than to that of anatomy. Though one subject may be more important than another, it does not necessarily follow that it should have more time devoted to it. Other things being equal, the more important subject should have more time given it. Not so much is known of physiology as of anatomy. Physiology is a much more difficult subject to teach and is in many cases not so well taught as anatomy. There are many things to take into consideration in deciding how much time should be given a subject.

Another matter only less difficult to determine is what shall be presented in any one subject. Every subject taught is so large that it cannot all be given to general students. Every teacher has to decide what he is going to teach his students and what he will omit. What to omit is one of the most trying problems a teacher has to solve. I would rather train a student to be a pathologist than teach a general student. A teacher has to keep in mind constantly, "Am I training these students to

be general practitioners, or am I training them to be specialists in my subject?"

Not only do teachers need discriminating judgment in this respect, but members of examining boards should use the same care. Examining boards have a good deal of influence in determining what shall be taught in any subject. It seems that an important reason for the existence of an examining board is that it serve to restrain instruction given in the colleges and keep it within the bounds of the practical. An examiner should be just as careful as a teacher not to throw emphasis on the unimportant things. He is not examining specialists in his subject, but is to find out whether the candidate has a knowledge of the subject that a general practitioner should have. Anatomy especially suffers from having emphasis placed on the wrong things. In nearly every state board or civil service examination one may find examples of questions that should not be asked. For example, do you think the ductus arteriosus and the foramen ovale need to be emphasized? In another recent examination one question in pathology was to name the varieties of carcinoma. In teaching carcinoma to my classes I had considered that it was less important for them to learn the names of the varieties than to study other things which otherwise must be omitted. On account of lack of time many things were omitted that I consider of much greater importance than the varieties of cancer.

A veterinarian is not different from anyone else. His brain cannot carry an unlimited number of facts. To have a student learn and keep in readiness for instant use a mass of facts that he will never need is entirely wrong. Of course much must be taught in giving a student a comprehensive knowledge of the subject that he will have no occasion to use directly. For example, in teaching carcinoma one necessarily has to teach the several kinds; but it is not necessary that a student keep the names of these varieties in his mind ready for instant use.

The order in which subjects shall be taught is comparatively a simple matter. Pathology deals with more or less changed

normal structure and function. The normal structures and functions are taught in anatomy and physiology. These subjects must precede pathology. Chemistry must precede pharmacology. Pharmacology and pathology must precede therapeutics. General pathology must be studied and completed before physical diagnosis, general surgery or medicine are begun. It is a great mistake for a student to be given pathological terms before he learns what they mean. He is certain to get either a wholly inadequate idea or even a wrong conception of them. It is worse than wasting a student's time. He has to unlearn something that he has already learned. Pus and inflammation, for example, are very difficult for a student to understand unless they are first presented in the laboratory. A student should not be allowed in the surgical clinic before he has completed general surgery, nor in the medical clinic until he has had physical diagnosis.

The order in which subjects must be taught is therefore pretty definitely fixed. Pathology has to come in the middle and latter parts of the course. With a course of only three years it is necessary to begin general pathology before anatomy and physiology are completed.

In general pathology the student learns the meaning of the processes and conditions with which he is to deal. It is not learning words and terms, but the meaning of these, what the conditions and processes are. Unless he knows what the pathological changes are, it is useless for a student to try to get a knowledge of medicine or surgery. He may be taught to repeat words, parrot-like; but his ideas cannot be clear. He cannot understand. If the future veterinarian is to deal intelligently with disease, he must first know what the pathological conditions are. This is not an easy matter. There is no royal road to acquire this knowledge. I am aware that in a recent pathology the claim is made to present the subject in words of one syllable, as it were, so that anyone can readily grasp it. This is a wrong conception of what general pathology is. The difficulty is not in learning the words. By the time the process or condition is understood by the student the name of it will be

learned. When it comes to the state that words are made to take the place of that for which they stand, something is radically wrong. Teachers of other subjects besides pathology need constantly to bear this truth in mind.

Pathology is not merely the gateway through which the student enters the field of his profession. It is a very important subject in itself. It is the subject one uses in making a diagnosis. This alone would be sufficient to give it a very high rank. The ability to make a diagnosis, to know what is taking place in the patient, is what distinguishes the skilled veterinarian from the quack.

A part of the pathology taught students by the departments of pathology in veterinary colleges is preparatory and explanatory to that taught in other departments, medicine, surgery and therapeutics. When a veterinarian is dealing with a case of a well-known disease or condition, he uses what he learned in medicine; but when he has something obscure, something not described in works on medicine, he must go back to general principles, that is, general pathology. Pathology deserves a goodly amount of time—much more than is given to it.

There is one part of pathology that receives little or no formal recognition, but which should be taught as a separate subject. I refer to physiological pathology. Pathological conditions are manifest by changed structure and deranged function. Of these the deranged function is usually the more important to a physician. He has to depend largely upon symptoms, the marks of the deranged function. With a four-year course, such a subject could profitably be added to the last year. With only three years, there seems no time to add another subject to the already overcrowded curriculum. Something could be done by allowing more time to special pathology or post-mortem examinations. It does not seem wise to add much physiological pathology at the expense of instruction in morbid anatomy. Too little time is now given to that. The importance of the subject demands that pathology be given a much larger place in the curriculum than it has in any of our colleges. Here

is what an eminent veterinarian\* has said as to the importance of pathology: "This field (*i. e.*, pathology) is the most important within the whole domain of the veterinary sciences; it is the one upon which the most typical and most important of our veterinary work pivots."

In conclusion, let me repeat the points that I have attempted to make. Thoughtful study should be given the correlation of subjects in the veterinary curriculum. The proportional value of each subject should be determined. Each subject must be considered not for its own sake, but as to what part of it is needed in the education of a general practitioner. The training of a specialist in any subject is a different matter. Both teachers and members of examining boards should carefully distinguish between what a specialist should know and what a general practitioner may be required to know of any subject. After the minimum of time each subject demands is allotted, what time remains should be given the particular subjects that will give the most valuable training.

When the curriculum is studied, I believe we shall find that changes may profitably be made. In particular, considering its relation to other subjects, its relative importance and the invaluable training it affords, a larger place should be given to pathology. It is in truth the backbone of the curriculum.

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\* Dr. Leonard Pearson, Report of Committee on Intelligence and Education, Proceed. A. V. M. A., 1907, p. 91.

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A PRINTER'S ERROR.—In some unaccountable way our printers inserted a line from Dr. Palmer's paper (next to last line, page 666, September issue.) between the first and second lines of the fifth news item on page 700, relative to Admiral Togo's trip to Toronto, which makes the latter read rather peculiar. Fortunately the line was duplicated and not transferred, as it would then have marred a valuable article.

## THE TREATMENT OF PNEUMONIA AND PLEURISY.\*

BY H. PRESTON HOSKINS, V.M.D., PHILADELPHIA, PA.

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To some of you a paper on so old a subject by so young a member may seem precocious, but it is not presented with the idea that I have something radically new or startling to offer, but more with the hope that my experience in treating these diseases may be augmented by the remarks which I hope will be brought out in the discussion.

Pneumonia in the horse has not the terrors of the same malady in the human family. Why this is a fact has never been satisfactorily explained to me. The very fact that we do not regard a case of pneumonia anywhere near so seriously as does the practitioner of human medicine, may account for the small amount of study and research work done by veterinarians with relation to the treatment of pneumonia.

Our most difficult cases of pneumonia are those that come as a sequel or complication of influenza, or shipping fever, seen mostly in the large, plethoric Western horses of draft type. In a large percentage of the cases, the pneumonic process is accompanied by more or less pleurisy. These cases too frequently take on a highly virulent form, the prognosis being anything but favorable, right from the beginning. They fail to respond to the most vigorous treatment and die with alarming regularity.

The treatment of pneumonia and pleurisy must be taken up from a number of standpoints. For convenience we will take up the following subjects: Environment, diet, local applications, and general therapeutics.

The very nature of pneumonia makes it necessary to have the environment the best possible, with regards to light, air, tem-

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Canada, August, 1911.

perature and sanitary conditions. Sunlight is recognized as one of our best and cheapest disinfectants, and we should make use of it as much as possible. A plentiful supply of pure air is a primary requisite in the treatment of pulmonary disorders. The human practitioner avails himself of pure oxygen in his efforts to afford his patient relief, but I doubt if this is resorted to very often by his fellow practitioner in the field of veterinary medicine. French veterinarians have reported good results with its use. They give inhalations for fifteen minutes twice daily. As a result, oxidation of the blood goes on more actively, the pulse becomes stronger, but the temperature is not affected. The course of resolution goes on in a regular manner, being complete in about eight days. One thousand litres of oxygen will suffice to treat a case of pneumonia, and the cost is less than two dollars.

Recourse to oxygen is indicated when signs of asphyxia are manifest, especially in double pneumonia. Our large draft horses need plenty of pure air when in health, and for this reason special attention should be paid to ventilation when they are sick. Nothing is more harmful than inhaling a vitiated atmosphere, and special stress is put on this fact so that its importance will not be lost sight of. Avoid direct draughts on the patient, and endeavor to maintain a uniform temperature. With regards to sanitation, it is needless to say that cleanliness is of the utmost importance. The bedding should be renewed daily, feces and wet bedding removed promptly, the feed trough and water bucket scalded every day, and every effort should be made with a view of maintaining as sanitary surroundings as possible.

We will next take up the treatment with reference to diet. On looking over records of fatal cases it is surprising to note what an important part the appetite plays. It is almost a general rule that as long as a horse will eat, he has a chance for recovery, no matter how serious his condition. But let him get off his feed and a large proportion of his chances are lost. For this reason strict attention should be paid to the diet. It is wrong to say "Give him anything he will eat," and stop there.

The best results are obtained where the patient is cared for by one attendant, or at most, two, one during the day and one at night. The nurse should be made to know the dangerous nature of the case and what an important rôle the matter of feeding plays. Small amounts of feed at frequent intervals is much to be preferred over the usual three meals a day. Give amounts that the patient will eat with a relish, and still be a little hungry. In other words, keep his appetite on edge.

Offer him water frequently, or keep it before him constantly, changing it for fresh at least every six hours, and scalding the bucket at least once daily. Such drugs as alcohol, potash salts, etc., can be conveniently administered in the water. Tempting foods can be given in the form of scalded oats, corn on the cob, oatmeal gruel, freshly cut grass, carrots, apples, etc. Corn may be objected to for various reasons, but experience in treating sick Western horses has proved that they cannot do without it. Sometimes it is the only thing these horses will eat. They have been raised on it, and, like the Irishman and his potatoes, cannot get along without it. Milk is a valuable article of diet for two reasons. It is said to increase diuresis, and thereby decrease the number of micro-organisms in the digestive tract.

Digestion should be watched closely, and everything done to preserve the integrity of the alimentary canal, as the close relationship existing between the respiratory and digestive tracts is very marked. Secondary infection of the diseased lung can easily take place by way of the digestive tract. Digestive disturbances frequently are the forerunners of gangrenous pneumonia. A fœtid diarrhœa should be looked upon as a bad symptom. Avoid constipation by the use of saline laxatives, such as artificial Carlsbad salts in the feed or water.

At times, even in health, the walls of the digestive tract appear to offer but a feeble resistance to the passage of micro-organisms. It therefore follows that this mode of infection is even more open when there is any disordered condition in the alimentary canal, and permits the passage of micro-organisms, both harmful and benign, into the system. Sometimes it is well

to flush out the mouth and rectum with mild antiseptic solutions, to still further lessen the danger of infection by the digestive tract.

When the appetite is entirely gone, we can make use of rectal feeding. We can employ the whites of eggs, boiled starch solutions, emulsions of fat, milk, etc. According to Johne, one of the best means of coaxing back a lost appetite is washing out the mouth with fresh water.

Therapeutic agents in the treatment of pneumonia are used with the view of combating pulmonary congestion, lowering internal temperature and preventing complications.

One of the earliest forms of treatment was venesection. Some of our best practitioners still make use of it. In a great many cases when we get to our patients the time for blood-letting is past, the cases having gone beyond the congestive stage. We can employ revulsives in the form of sinapisms, but these have the disadvantage of being uncertain, and, besides, hampering the veterinarian in his subsequent physical examination of the affected parts. Strong applications of mustard are sometimes indicated for their stimulant effect, rather than for their derivative action. The Priessnitz compress is a valuable adjunct in the local treatment of diseases of the chest, when the gravity of the case or other conditions warrant its use. Cataplasms applied thick and warm sometimes give splendid results in the early stages.

Pneumonia is one of the diseases in which the treatment is largely symptomatic. It is mainly supportive, and uncomplicated cases run the usual course and recover in due time. Some European veterinarians regard digitalis as almost a specific for pneumonia. When employed in half-drachm doses of the tincture every three hours, it does its part very well in keeping up the heart action during the critical stages. The diffusible stimulants still have their admirers. In human medicine intramuscular injections of camphor have been employed with good results. It is reported that shortly after these injections the odor of camphor can be detected on the breath. Creosote and guaiacol

are two drugs that are employed with advantage in pneumonia. Being excreted by way of the lungs, they act as disinfectants for the diseased respiratory tract, which is a very important feature.

Among the therapeutic agents that we have at our command, perhaps the most recent are nuclein and antipneumococcic serum. Veterinarians are reporting that nuclein is the best biological product that has ever been placed at their command. In cases of pneumonia a dose of 10 c.c. hypodermically is recommended twice daily during the critical stages, and then once daily as long as indicated. Other treatment is usually employed, the nuclein being given only as an adjunct, but it is said to do its work well. Antipneumococcic serum has been much exploited in late years. At first glance, like most of our biological products, its price appears almost prohibitive if administered in the dosage recommended by the firms preparing it.

During the past winter so much was said of it by other practitioners that I decided to give it a trial. My first case resulted in failure, but I decided to try it again, as in the first instance I could not say that it had had a fair trial, the case having been one of traumatic pneumonia. In the second and third cases I had more satisfactory results, although both were cases of pleuro-pneumonia. Within twenty hours after the administration of the first dose all symptoms were ameliorated to a greater or less extent. The temperature dropped several degrees, the pulse became 25 per cent. to 50 per cent. stronger, the breathing less labored, and the patient somewhat brighter. Encouraged by success in these cases, I tried it again in a number of cases with varying success.

However, this fact struck me with some force, namely, that in a number of cases the serum treatment brought beautiful results, while in others the results were either mediocre or nil. Was this because the serum was made from an organism of the same strain as that causing the disease in the patients that responded to the serum treatment so markedly?

On the other hand, bacteriologists and pathologists the world over have arrived at almost uniform results in the study of the disease, whether it be croupous, catarrhal or traumatic, whether it assumes the lobar or lobular type, and whether it is isolated or epizootic.

Kyes undertook to determine whether there are specific antibodies for the pneumococcus, and has reported positive results. He used leghorn roosters for his experiments, as this fowl is relatively non-susceptible to the pneumococcus. After repeated injections of ascending doses of a suspension of the organism, the fowl was bled and the serum obtained. He found that this serum contained a substance which would neutralize or render harmless the virulent pneumococcus when injected simultaneously with, or some time after, the injection of the suspension of the pneumococcus. Some of the mice were allowed to become very sick before the serum was administered, but in every case, by pushing the serum in relatively large doses, the animals made a complete recovery.

Workers in the field of human medicine from time to time have startled the world by their announcements of the discovery of a cure for pneumonia with the aid of vaccines and sera. But no matter how great their assertions, the more conservative practitioners seem loath to accept or put any faith in their claims.

What has been said in the treatment of pneumonia, with particular reference to hygiene, will equally apply to pleurisy. Some practitioners have told me that their treatment for the two diseases varied but slightly. I can readily see how this would work out in some cases, while in the majority of them result in failure. With regard to diet, the only change would be in favor of dry foods, as the less moisture taken into the body the less there is to find its way to the pleural cavity if there is effusion. With the exception of cold water, local applications interfere with percussion and auscultation. Frequently this is of more importance in pleurisy than in pneumonia. Cataplasms of kaolin and the other similar preparations on the

market are of great advantage where there is much pain and the breathing is very labored.

Internally much dependence can be placed in digitalis for its cardiac and indirectly diuretic action. Its alkaloid, digitalin, or sparteine may be employed for the same purpose. Iodide of potash is a valuable agent in this disease, if given in full doses every six hours until physiological symptoms are observed. If the heart will stand it, a grain of arecoline daily will hasten resolution. By combining a quarter grain of strychnia with the arecoline, its depressant action on the heart may be overcome.

Fluid in the chest should be removed by surgical means, if it at all hampers the lungs or shows any tardiness in being absorbed and eliminated in other directions, or if it is purulent, which can be determined by an exploratory puncture. Usually one tapping is not sufficient, when it is resorted to at all, three or four operations being necessary, increasing the intervals between each two succeeding tappings, as indicated by the amount of fluid obtained each time.

The injection of iodine into the thoracic cavity has been discontinued by most practitioners, it being preferable to get the effect of the iodine by the internal administration of either the iodide of potash or ammonia. If the disease runs into the chronic form of dry pleurisy, it is well to keep up the internal alterative treatment, and apply vigorous blisters to the thoracic walls over the affected areas. Usually such cases do not respond very well to treatment, but that outlined here has been of benefit in a few cases.

While waiting for the time when we will have a specific treatment for each disease, we must content ourselves with a treatment which is symptomatic, after all. It is somewhat remarkable too, when we consider how different are our views at times with reference to these diseases, and yet, when different lines of treatment are compared, in spite of their apparent variations, they are found to be quite similar in reality.

## “FOOT EVIL” IN HORSES AND MULES AND “SORE MOUTH” IN DOGS.\*

BY W. H. DALRYMPLE, BATON ROUGE, LA.

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In the first place, I desire to offer an apology for the meagreness of the information I am able to afford regarding the conditions which I have chosen as my part of the report of the Committee on Diseases.

It has been my misfortune, if I might be permitted to put it that way, to have been quite fully occupied with duties at home requiring the greater part of my time and attention, which has prevented my being able to devote as much leisure as I could have wished to the preparation of a report worthy of such an important committee of this association. And it was at the last minute, so to speak, that I decided upon the subjects which constitute its basis.

I may be permitted to state, further, that my chief object in bringing these two conditions to the notice of the committee was more to create a discussion, with the hope of obtaining more information concerning them from some of our Southern members, who might, perchance, be present, than to offer anything new, or even definite, regarding them. The two conditions, however, seem to be confined, in a large measure, to the Southern States, and possibly, I think, the more southerly of them, but authentic literature appears to be remarkably scarce on either of them, possibly because of the fact that the attention of the authors of our standard works on pathology has not hitherto been directed to them.

“Foot-evil” is the popular name given an acute coronary dermatitis, which seems to arise, probably through a slight

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abrasion, at the posterior part of the foot, at the heel, and unless checked, continues to proceed around the coronet, after which separation takes place between the skin and the hoof, with ultimate sloughing of the latter structure.

During the progress of the condition the animal suffers intensely, and is rendered useless to the owner, temporarily, always; sometimes permanently.

I should, perhaps, have mentioned that the term “dew-poison” is sometimes given this ailment, which would suggest a season of the year when dew is abundant in the early mornings and at nights.

In wet spring or early summer seasons, the condition does not seem to be so prevalent; and it may be prevented either by keeping the animals from pasture until the dew is off the ground or by applying some oleaginous material to the coronets, pasterns, heels, etc., previous to turning them out at night to graze.

The condition appears to be local, both as to certain fields, farms and sections.

As to its true cause, I am sorry to say I am unable to offer anything at all definite. I have thought of the possibility of irritation brought about by an acrid property possessed by some variety of plant or plants dissolved out in the dew. Whether this is altogether tenable I am not prepared to say. However, the fact remains that the ailment is rarely, or never, seen under dewless conditions; or where oily or greasy substances are employed as preventives. It may be bacterial in origin, but I am not aware of any specific organism having yet been isolated.

As to therapeutics, many varieties of agents have been adopted—some reasonable, others extremely heroic from ordinary disinfectants and astringents to the most powerful counter-irritants and escharotics. As illustrations of the latter, employed usually by the laity, however, I may mention the following: Pouring boiling water in a small stream on and around the surface of the coronet; the saturation of the coronary surface with turpentine, and the latter ignited.

Some of the more reasonable and humane methods are: First of all, thorough cleansing of the part, to get rid of accumulated concretions, and leave a clean surface, and the application of iodine, either tincture or Lugol's solution. Or, a swab of cheesecloth or absorbent cotton applied around the coronet, and this kept moist with bichloride of mercury solution (about 1:500). Or, some of the mineral sulphates, either separate or combined. Some have reported favorable results from the use of an application of the impure carbonate of lead (white lead) thickly placed around the coronet.

A very useful disinfectant is a mixture of equal parts, by weight, of gum camphor and pure carbolic acid in liquid form. Each of these ingredients seems to deprive the other of its irritating effect.

I should like to crave a moment's indulgence to say a word regarding this particular mixture, which we may call for the present "campho-phenique," as this name suggests its ingredients.

It was first called to my attention by Dr. Wm. Perrin Nicholson, Dean of the then Southern Medical College at Atlanta, Ga., who seems to have been the first to observe the difference in the effect of the combination as against that of either of the ingredients in separate form. Dr. Nicholson experimented with it for quite a time, chiefly on himself, and afterwards made it the subject of a paper which he presented at a meeting of the Tri-State Medical Association at Atlanta, about 1894 or '95.

I have used this mixture in the condition under consideration with, as I thought at the time, excellent results, and I am inclined to award it a useful place as a disinfectant in foot conditions generally.

I may say, however, that I do not know of any specific cases that have recovered following the continued use of any one, or even all, of the agents I have mentioned. That is to say, I do not know of a specific in every case. Sometimes one, sometimes another, line of treatment will secure favorable results. And it

may be that occasionally a case will recover in spite of all of them.

I am sorry we have not been able, so far, to institute any careful investigations into the true cause of this ailment; although it is one which certainly merits it, as it in the aggregate must at times occasion severe losses to horse and mule owners in the Gulf States especially; if not from permanent injury to the animals, at least from temporary loss of their use for a time, which is often quite considerable.

It has occurred to me that the condition might possibly be of a necrobacillotic character, but I have not been able to make the necessary investigation, nor have I heard of other animals, such as sheep, suffering from necrobacillosis in my section of the country, although they frequently occupy the same pastures as horses and mules which become victims of this coronary dermatitic condition.

I should, perhaps, add that the disease is much more widespread in some seasons than in others, and for the past several years it would seem that we have seen or heard remarkably little of it.

#### "SORE MOUTH," "BLACK TONGUE," OR ACUTE SEPTIC STOMATITIS IN DOGS.

As with the former condition, so with this—I am, unfortunately, unable to offer any positive observations, either as to the proximal cause or treatment, which might in any way be looked upon as specific.

Usually when the owner notices anything wrong with his dog, the condition has advanced to a stage which causes the patient great inconvenience in mastication and deglutition, and it is generally then that the services of the professional man are sought.

The buccal mucosa is intensely and uniformly injected, often assuming such a dark-red hue as to suggest the appellation "black-tongue," which name some occasionally give to the ailment.

There is generally excessive salivation, with œdematous condition of the membrane. The inflammation may, probably, extend along both the alimentary and respiratory tracts, although I do not say so from post-mortem experience. The animal shows symptoms of an acute septic fever, and ultimately succumbs, the end being hastened by starvation through inability to swallow either solids or liquids.

The cause, so far as I know, is still in doubt.

So far as my observation has extended, the condition is one which affects country dogs rather than the purely city or town animal. Or, in other words, the victim, in my section of the South at least, is mainly the sporting dog, such as the setter, pointer or hound which has led me to the opinion that such animals are exposed while out in the country in the pursuit of game, to the probable cause, whatever that may be.

Gateways for organismal invasion in the dog's mouth are by no means rare, through abrasions of the mucous membrane from eating bones with penetrating points, and also through eating grass.

Dogs of the class mentioned are quite likely to come across carrion of some kind while out hunting, especially where the enforcement of sanitary regulations with respect to the proper disposition of carcasses is not of the strictest, and they are just as likely to feed upon it when the opportunity is afforded them.

I have been rather inclined to the opinion that this highly septic material may be one of, if not the chief cause of infection, when aided by the solution of continuity of the buccal membrane. However, this is merely an opinion, without the requisite backing of bacterial investigation.

Although this disease causes immense losses to owners of high-priced dogs in the South, it is questionable whether the Federal authorities, who have in their hands the disbursing of special appropriations, such as the Adams Fund, for purely research work along agricultural lines, would consider money spent in investigating a condition of the "sporting dog" a legitimate expenditure by an agricultural experiment station; and for

this reason the station is rather handicapped in its effort, or desire at least, to afford the necessary relief in this connection.

As to therapeutics: I believe that many more cases would recover than is the rule if they were taken in time, and before the condition became so extensive and far-reaching. But, as I have previously mentioned, it is not usually observed by the owner, nor is the aid of the veterinarian sought until a stage in the disease has been reached that renders it past amenability to treatment.

Satisfactory results are occasionally secured from the local use of different disinfectant and astringent agents, either singly or in combination. Of these I might mention listerine, borolyptol, glycothymoline, formalia, iodine, hydrogen peroxide, potassium chlorate, sodium bichlorate, potash alum, silver nitrate solution, carbolic acid solution, etc.

Demulcent liquid food is indicated, if the animal is at all able to swallow.

Although I have not had a personal opportunity of using them, I know of some practitioners who have tried some of the serums, especially antidiphtheritic, and antistreptococcic, but, apparently, with negative results.

As a preventive, I have thought, and occasionally suggested, that if it were possible and practicable to make and adapt a light, suitable muzzle, to the bird dog especially, that would prevent its eating putrescent material of any kind when out in the country after game, it might, in a measure at least, prevent this condition. And, in addition, if the mouth was to be well washed out after returning from the day's sport with one or other of the medicinal agents just mentioned, it might aid in the destruction of septic organisms in the buccal cavity. Even without the use of the suggested mechanical device the disinfectant treatment might ameliorate the condition.

It is possible, perhaps, that an autogenous vaccine might be prepared for each of the conditions mentioned, as it is scarcely possible to predict nowadays what may be done, with such rapid advancement in the important field of biologics.

I feel, gentlemen, that I have taken up your time with a "story," rather than a report, concerning the two conditions which I have attempted to bring to your notice in a brief way. However, I trust it may arouse greater interest regarding them, in those who are more or less called upon to deal with them, as they are undoubtedly of considerable moment to practitioners in certain sections of the South.

A GOOD MAN RESIGNS—The Department of Agriculture loses a particularly capable outfit of brains in Dr. J. G. Rutherford, C.M.G., Veterinary Director-General and Live-Stock Commissioner of Canada, who leaves the Government service for work that will bring him more money and greater peace of mind. Rutherford knew his job up and down, straight through, and clear across. He had been a member of Parliament and knew what the people wanted. He had been a farmer and knew what the farmers wanted. He was trained as a veterinary surgeon in the thorough English school and knew what the animals wanted. When he took hold in 1902 he found nothing to his hand except an Act of Parliament which was so much waste paper. In nine years he had created a health-of-animals branch, a meat and food inspection service with a hundred inspectors, a biological laboratory with a staff of trained pathologists, and a live-stock branch that is doing much to promote friendly relations between breeders and their market. Quarantine work has been systematized and the importation of live stock into Canada is now thoroughly under the control of the department. Hog cholera has almost disappeared; glanders has been stamped out except in Saskatchewan; cattle mange, horse mange, sheep scab, and many other minor diseases have been effectively handled. Rutherford brought unusual powers of special investigation to his duties. For example, when an epidemic broke out among the cattle in Nova Scotia he discovered that it was due to a poisonous weed. He brought in sheep that throve on the weed and put an end to the epidemic. As president of the American Veterinary Medical Association, Rutherford had the chief hand in forming the International Commission for the Control of Bovine Tuberculosis, whose good work has just begun. Incidentally Rutherford did a lot for veterinary education by taking it out of private hands and making it a university course. Like many brilliant, original, and public-minded civil servants, he seems to have been too good to keep.—(*Collier's*.)

## DEGREES.

BY S. R. HOWARD, HILLSBORO, OHIO.

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“They purchase to themselves a good degree.” (I. Timothy, 3-13.)

“My hoss has bots! I’m sure he’ll die!”  
Roars Sam Emanuel Free.  
With beaming eyes his daughters cry,  
“Get astute M. D. C.”

“My cow has got the holler horn!”  
Screams Martha Lydia Free.  
Grandpa replies while shelling corn,  
“Call keen V. M. D.”

“My colt has got the hooks, I’m sure!”  
Bawls Bub Emanuel Free.  
Quoth grandma, “If you want a cure  
Go get that sage M. V.”

“My calves have surely got buckeyed!”  
Whined rheumatic Mrs. Free.  
Old man Grump said as he sighed,  
“Get that wise M. D. V.”

“My pup’s been fed some powdered glass!”  
Exclaimed Malinda Hess.  
The children yelled, “O hustle up!  
Go get deft B. V. Sc.”

“My sow has tried but can not pig,”  
Lamented farmer Hess.  
“If that is true,” replied a prig,  
“Get skillful D. V. S.”

“The D. V. S. is full of rum,”  
Chimed in the young man Hess;  
“The old V. S. for me, he’ll come.  
(He’s sweet on sister Bess.)”

“ My son’s at veterinary school,”  
 Said venerable Mr. Proctor.  
 “ He’s D. V. M. or one of these,  
 But never a Horse Doctor.”

*l’envoi.*

Then Shakespeare spoke, “ What’s all this spiel  
 About, you Hesses and you Frees?  
 What wound did ever heal  
 But by degrees?” (*Othello, Act II.*)

DEGREE. An academical rank or title conferred on scholars by an institution of learning usually authenticated by a diploma certifying and guaranteeing proficiency in certain branches of learning or the arts, or sometimes as an honorary distinction.— (*Standard Dictionary.*)

For many hundreds of years people have known what a veterinarian or veterinary surgeon was. These titles can be protected by law as well as any mysterious jumble of letters. Knowing their meaning the people will fully respect us and our calling if we are proficient and worthy. If we are undeserving our abilities and characters stand on an extremely low plane of public estimation, and we will feel even this unambiguous and comprehensive degree “ hang loose about us like a giant’s robe upon a dwarfish thief.”

A CORRECTION.—Dr. Reuben Hilty desires to call attention to two errors in his article on “ Azoturia ” in the September issue. On page 654 the words “ good quality,” in brackets, following “ serum globulin,” *should read* “ good quantity ”; and on page 655, in the fifth line under “ *Treatment and Care,* ” where it reads “ able to rise,” it *should read* “ unable to rise.” The doctor explains that these errors occurred in having his article typewritten, which copy he did not read. A typographical error in the same article on page 653 occurs by the letter “ 1 ” appearing where “ f ” should appear in “ defibrinated.”

## ABSTRACTS FROM EXCHANGES.

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### ENGLISH REVIEW.

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

EQUINE TUBERCULOSIS [*Brennan De Vine*].—Bred on the farm where he is, this five-year-old horse is reported off his food and blowing badly. He has 30 respirations a minute, a pulse of 50, and his temperature is 102° F. No definite symptoms being present he is considered as a case of slight feverish cold and put under stimulant treatment. After two days the temperature is down to 101° but the pulse and respiration remain the same. This condition lasted for four weeks and tuberculin test was applied. The injection was made on the near side of the neck without any antiseptic care taken. The local reaction was very large and the temperature raised to 105.6° F. Thinking that possibly the excessive local reaction had been due to some infection, a second tuberculin test was again applied some two weeks after, but this time the region of the neck where it was done was thoroughly disinfected. This injection was followed by a similar local reaction and raised temperature. The case was one of tuberculosis and the horse destroyed. *Post mortem*—Heart, liver, bowels and kidneys normal. Spleen covered with tuberculous nodules. Lungs enormously enlarged. The heart and bronchia cut off, the lungs weighed 77 pounds. The mediastinal lymphatic glands were apparently normal. Microscopic examination of the lungs showed giant cells and tubercle bacilli.—(*Vet. Record.*)

UNUSUAL CASE OF ANTHRAX IN A MARE [*J. H. Carter, F.R.C.V.S., F.R.S.E.*].—Four-year-old breedy harness mare was off her feed one morning; she was dull and dejected, with a slight nasal discharge, breathing slightly disturbed, pulse 96, temperature 104.3-5. Auscultation and percussion negative; extremities normal. A fever draught was administered. The next day the mare is worse, breathing labored. She is dull and dejected, ears and extremities cold. Conjunctiva injected, pulse imper-

ceptible. Temperature dropped to  $102^{\circ}$ , refused all food and water. Stimulants are prescribed and mustard applied to the chest. The mare died after a few hours. *Autopsy*—Great quantity of straw-colored fluid escaped as the abdomen is open; one ovary is ruptured and showing a large black clot of blood. The spleen was much swollen and weighed  $9\frac{1}{2}$  pounds. Some blood was collected and examined with microscope. Anthrax bacilli was found in great quantity. Inquiry into the history of the mare failed to give information as to the cause of the disease.—(*Vet. Record.*)

FRACTURE OF THE HYOID BONE [*Capt. Clive Webb, A.V.C., F.R.C.V.S.*]—Admitted for treatment of suspected strangles, this seven-year-old brown mare has a ball given to her with a new pattern balling gun, which had been successfully tried before in several instances. On the present occasion, however, the mare threw her head about and when the gun was withdrawn the end of it was covered with blood. A few days after there was profuse discharge from both nostrils of food and blood. There was no cough. Frequent examination of the mouth and fauces were negative. The discharge continuing to be profuse, the left maxillary sinus was trephined but found healthy. No improvement followed. Partial paralysis of the pharynx was suspected. Nasal cavities flushed out with rubber tube. Then symptoms of pneumonia developed. Stinking discharge followed the gangrene of the lungs. Death. *Post mortem*—Extensive lesions of septic pneumonia on both lungs. Long cornua of hyoid on right side fractured about its centre. A piece of it has become exfoliated and detached from the main trunk, so that the fractured ends of the cornua did not come into apposition. Guttural pouches normal.—(*Vet. News.*)

PARTURIENT LAMINITIS AND ADRENALINE [*P. R. Thompson, M.R.C.V.S.*]—Twelve-year-old brood mare was six months pregnant. One morning she is uneasy and has colic. She was about to abort. The foetus is delivered. In the evening foetal membranes are retained and the uterus half prolapsed. The envelopes were ligatured as high as possible, the soiled portion cut off and the uterus put back in place after disinfection. On the following evening, laminitis of both fore feet was well marked. The temperature was up to  $103.4^{\circ}$  F. 3 c.c. (90m) of adrenaline, chloride solution 1-1000 diluted with an equal

quantity of sterilized water, were injected at two points of each coronet about an inch above the hoof. Sulphate of magnesia and sulph. of quinine were prescribed. Improvement was surprising, already on the next day and no further treatment indicated. Recovery was complete in four days.—(*Vet. Journal.*)

ACCIDENTS [*G. Mayall, M.R.C.V.S.*].—Records of mishaps by automobiles. A Schipperke is knocked on the head, is in a comatose condition from concussion of the brain. Two doses of salt volatile are given in six hours. Late in the afternoon he raises his head and in the evening is walking. Iodide completes the recovery.

Fox terrier is run over across the fore ribs and back. Bleeds from the mouth. Purgative, hot flannels and liniment on the thorax. Recovery.

Dog run over across the loins, only sore for a day or two.

Scottish terrier also run over, passed blood in his urine, chloritone, hazeline, milk diet, good recovery in a week.

Cat fell in bucket of whitewash. Got over safe after good washing; is then removed and was stiff only for a day or two.

Fox terrier also fell in bucket of whitewash; nothing is done and after three days his hind legs and genitals are excoriated and inflamed; his anus was severely burnt. Dusted with boric ointment, but after a week the dog died. Immediate washing after the accident would have saved him.—(*Vet. Journal.*)

PROLAPSUS RECTI IN A DOG [*Same Author*].—The concise record of a case where a prolapsus of the rectum existed was reduced and the dog had a capsule of chloritone and an injection of equal parts of hazeline and cold water. Remained all well for a week when the trouble returned and was treated in the same way; treatment being followed for six days. The dog passed large quantities of matted hair. Finally got entirely well.—(*Ibid.*)

PYÆMIA IN A DOG [*Prof. Geo. H. Wooldridge, F.R.C.V.S.*].—Five-months-old Irish terrier had swollen throat and head. Sub-parotideal lymphatic glands of both sides swollen also. One is fluctuating, punctured, and has creamy pus escape. Appetite is poor, tendency to diarrhoea. Treatment, massage and local fomentations, with chinisol solutions, carb. bismuth and tannoform in emulsion petrol and extract malt's liquidus. After a

week the dog is in very poor condition. Very thin and weak, he has numerous superficial abscesses over the body, the pre-scapular region, the axilla, the groin, behind each thigh, the base of the tail, the dorsal vertebræ, the poll and the left angle of the haunch. Most of these abscesses are ulcerated and discharge creamy pus. Local treatment was chinosol, 1-500, tinct. nux vomica and then nuclein solution of Parke, Davis & Co. injected subcutaneously in dose of 2 c.c. Soon the patient became brighter, his appetite returned, the abscesses healed and by degrees convalescence was fully established. To the use of nuclein the writer attributes the principal effect of the recovery.—(*Vet. Jour.*)

CHOLESTEATOMA IN THE BRAIN OF A HORSE [*Sir John McFadyean*].—The record of the case tells that the mare was purchased at the age of seven and worked for four years without showing any trouble. She was then kept off work as having sprained the muscles of her back. She was crossing her hind legs and unable to move backwards. After two months of treatment she was able to resume work, and during twelve months she remained dull, sluggish, had to be urged with the whip, to which she paid little attention. On three occasions she fell back in her stall and broke the chain of the halter. Laid up again, she has complete anorexia, extreme dullness, if compelled to move backwards she drags her feet on the ground or rears up. The pulse is almost imperceptible. Treated with stimulants for a week she gradually improved. After working again for short while she was one day put in her box stall to feed when an hour or so after she was taken with giddiness, reeled round her box with the head held high, fell down, got up and thrust her head into a corner, acting as if she was pushing forward. The next morning she was found dead.

At the post mortem the inspection of the brain showed between the right cerebral hemisphere and the cerebellum a tumor which had undoubtedly grown in the hemisphere. The growth had an outer membrane and was surrounded with blood. The contents of the tumor also partly mixed with blood were brown in color, putty-like in consistence and felt greasy to the touch. Microscopic examination showed no cholesterol or other crystals in their contents.—(*Journ. of Comp. Path. and Therap.*)

FATAL HEMORRHAGE FOLLOWING TOOTH EXTRACTION [*Mr. J. McRea Frost, M.R.C.V.S.*].—Four or five-year-old Scotch

terrier has a continuous discharge from under the orbit. Diagnosis, pus in the antrum of the carnassial molar. Extraction is advised performed and the tooth comes out easily and chinosol injection thrown from the opening on the face through the empty alveola. Hemorrhage not unusually abundant and the dog is sent home with antiseptic wash to be syringed in for a few days. The next morning report came that the dog had lost great deal of blood during the night. Adrenalin stopped the flow and the socket was plugged with gauze saturated with same solution. The dog being very restless had morphia injected hypodermically, with also ergotine. In the afternoon the bleeding had stopped but there is a large swelling about the face and a clot of blood protruded out of the facial opening. The mouth and cheeks are full also. This is washed out and adrenalin used again. A quarter of an hour after the dog vomits pure blood. The bowels were first strained with blood and then pure blood runs out. Then the dog grew worse and died in half an hour. The author considers this case as one due to hæmophilia.—(*Vet. Rec.*)

CONGENITAL DEFECT IN THE HEART OF A HEIFER [*A. Leslie Sheather, M.R.C.V.S., B.Sc.*].—A pure Guernsey heifer, aged 15 months, has shown no symptoms of illness. She is in poor condition. One morning she is observed standing for about a minute with head and neck extended, swaying from side to side, and as if she had been down and struggling. Respiration was labored. Animal coughed a good deal. On auscultating the chest the heart sounds were distinct. The following day the cow seems in perfect health and the morning after is found dying. *Post mortem*.—Lesions exist only in the heart, which resembles in shape more that of a dog than that of an ox. Pulmonary artery is larger than the aorta. On opening the cavities of the heart there were observed: The auricular surfaces of both auriculo-ventricular valves have small vegetations which are more numerous on the left side. The largest is as big as a pea. The valves of the pulmonary artery show large fibrinous deposits on the arterial side, sufficiently large to occlude the vessel. On the inner surface of the ventricular wall and close to the pulmonary artery a number of tumor-like projections were found. The aortic valves quite normal, but the vessel measured only  $\frac{3}{4}$ -inch in diameter. Auricles appear normal except that the foramen ovale is persistent in form, oval in shape, and measur-

ing about  $\frac{1}{2}$ -inch in diameter. In the interventricular septum there was to be seen a large, somewhat triangular foramen, which in the left ventricle opened immediately below the aortic valves and in the right close to the auriculo-ventricular opening, and between it and the orifice of the pulmonary artery. This opening measured two inches in length and one in breadth.—*Journ. of Comp. Pathol. and Therap.*)

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### FRENCH REVIEW.

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

TWO CASES OF COLD ABSCESSSES OF BONES [*Mr. Cabaye, Student.*]—A three-year-old dog is quite lame on the right front leg. The shoulder is the seat of a diffused sore and warm swelling. There is no history of the case, but as the dog has crossed a river in swimming, rheumatism is suspected and appropriate treatment prescribed. No improvement is obtained and after a month the dog does not rest on his leg any more; there is hypertrophy of the scapular fossæ and a warm and painful swelling under the shoulder. Sub-scapular abscess is suspected but exploring needle gives no result; the region is blistered and finally the dog is destroyed. At the autopsy the scapula is found with its external face the seat of hypertrophic periostitis, the muscles are trophied. The internal face shows also periostitis and an abscess contained purulent fluid. There was no indication of fracture.

A ten-year-old dog received a violent bruise on the left arm, which is treated by blister, firing and tinct. of iodine, without results. The animal does not rest on his leg and there is a swelling on the superior third of the bone. This swelling is warm and painful. The forearm is atrophied. Electricity is resorted to without result and the dog is destroyed. *Post mortem*—The subcutaneous tissue is thick and infiltrated, scapular muscles atrophied and pale in color. Their tendons are surrounded with a thick envelope of fibrous exudation which forms the anterior wall of a large abscess bound posteriorly by the humerus. This abscess communicates with the central cavity of the humerus by two fistulas, one in front below the articular head. The humerus is the seat of an hypertrophic periostitis, all over its

surface except the inferior extremity, which has remained healthy. The condition and form of the body of the humerus indicated that there had been a fracture of the bone.—(*Rev. Veter.*)

HEPATIC ABSCESS OPENS IN POSTERIOR VENA CAVA [*Mr. Alfred Lhoste.*].—Seven-year-old steer has been ailing two years ago but a diagnosis had remained doubtful. Since that time the appetite has been gradually diminishing and as a consequence he has lost flesh and strength. His skin is thick and close to the bones, the hair standing, the mucosae are anemic. The temperature is normal. Heart and lungs present nothing abnormal. Fæces are rare but normal; nothing wrong towards the kidneys; tuberculin test is negative. After a few days of tonic treatment the steer dies suddenly. At the autopsy, the liver, largely hypertrophied, has in its centre a tumor as big as a child's head. It is soft, fluctuating and contains about one litre of yellow thick pus. At the point where the purulent collection is in contact with the vena cava, this is found thinned and with an ulceration opening in the vein. The inner coating of the vessel shows that it is covered with pus. The right auricle and half of the right ventricle are filled with purulent fluid, which is traced in the axillary vein.—(*Rev. Vet.*)

CACODYLATE OF SODIUM IN VETERINARY MEDICINE [*Mr. Lanceleur.*].—The author has used it in hypodermic injections at the dose of 50 to 75 centigrammes a day in 1/10 solution. The animals received two injections daily for ten days, followed by a rest of the same lapse of time. In a certain number of animals, thin, in bad condition, this indication has given excellent results, shown by an increase in weight (sometimes very great), 80 kilogs in 45 days. It can be recommended to bring animals rapidly in good condition, and especially those convalescents of severe diseases. It facilitates assimilation. Indeed, arsenic stimulates the cellular functions, increases the appetite, improves the digestion, the nutrition, and of course promotes the development of fat.—(*R. V. and Military Vet. Rev.*)

RUPTURE OF THE HEART IN A HORSE [*Mr. Carret.*].—An eighteen-year-old mare is under treatment for pasteurellose. As the recovery seems to be complete she dies suddenly.

At the autopsy the pericardium is found largely distended by blood. The heart is very big and the superficial grooves are

filled with an abundant mass of fat. The myocardium is pale, easily torn, and covered with hemorrhagic points. The right auricle has a laceration three centimeters long. The histological examination shows a fatty infiltration of the interstitial connective tissue and an acute inflammation of the myocardium towards the point of the heart. This fatty degeneration and the presence of acute myositis was the cause of the laceration.—(*Ibid.*)

**SYMPATHETIC OPTHALMIA** [*Mr. Vauthrin*].—Transported by rail a four-year-old colt gets a severe bruise of the left orbital region, conjunctivitis and corneitis follows with swelling of the eyelids, lachrymation and photophobia. Some time after these manifestations an abscess is found on the internal commissure of the eyelids, it is opened and a few splinters of bone removed. About that time an almost complete loss of sight is observed on the right side. Five months later when the mare is called to pass a remount inspection, nothing abnormal is detected. But three months after the horse is entirely blind, knocking himself against the door of the box stall, walking with hesitancy and the characteristic allure. With the ophthalmoscope, after atropine instillation, the left eye is seen half dilated, the pupil quite regular but with a strong synechia, which from the centre of the crystalline lens, runs to the middle of the inferior border of the pupil. There is also diffused capsular cataract. On the right side, towards the inner angle of the pupil, there are small whitish spots, lenticular cataract. The vitreous is cloudy and the aqueous also, and opalescent. The sympathetic origin of the right ophthalmia is quite justifiable.—(*R. V. Milit. Vet. Rev.*)

**LATE CASE OF PARTURIENT APOPLEXY** [*Mr. F. Muraz*].—Cases of this trouble occurring a long time after the accouchement are not numerous. In the month of May the writer was called to attend a seven-year-old cow which had become suddenly sick. She is lying on the left side, the head inclined on the shoulder; she moans frequently, is tympanitic, temperature  $38.3^{\circ}$  C., 72 pulsations and 45 respirations are recorded. The udder is flabby and empty. The animal is unable to rise. It is a plain case of apoplexy and the cow has had her calf seven weeks before. Insufflation of air in the udder is done at once. After one-quarter of an hour improvements are noticeable in the symptoms and six hours after the animal is up. Recovery, however, was not complete as there remained a paralysis of the lower

jaw, lips and tongue and the animal is unable to eat. This alarming condition, however, soon subsided and in three days the cow had completely recovered.—(*Bullet. des Sci. Vet. de Lyon.*)

MEDIASTINE TUBERCULOUS ADENITIS CAUSES INTERMITTENT TYMPANITIS [*Mr. Pierre Bitard*].—Five-year-old steer is rather thin and in poor condition. Since six weeks he is subject to intermittent tympanitis, which subsides after several eructations. He has great appetite but seldom ruminates. He is treated by the keeper, who punctured the rumen, but as the tympanitis increases the writer is summoned to see the steer. Suspecting the case one of tuberculosis, the test of tuberculin was advised but could not be applied as the temperature of the animal varied between  $39^{\circ}$  and  $39.6^{\circ}$ . Laxatives and digestive stimulating treatment is prescribed. No improvement is obtained. After five days of observation slaughtering was advised. On opening the cadaver there was found under the rumen a large peritoneal infiltration extending from the wound of the rumen to the sub-lumbar region. This is due to the improper puncture of the keeper. The abdominal organs are healthy. In the thorax the lungs are sound but two of the lymphatic glands of the posterior mediastinum in connection with the pneumogastric are hypertrophied and full with cretaceous tuberculous matter in a state of softening.—(*Progrès Veter.*)

THE meeting of the New York State Veterinary Medical Society, held in Brooklyn in September, was a marked success. The president's address was a masterpiece, the literary program ample, and the discussions interesting and profitable. All of which resulted in a list of resolutions adopted by the society that are directly in line with the progressive condition of veterinary medicine to-day. Beside a good attendance by its members, the society was honored by visiting veterinarians from Ohio, Pennsylvania, New Jersey, Connecticut and Massachusetts. The clinic at the Berns Veterinary Hospital was large and varied; ranging from operations upon horses to the caponizing of fowls. The finale, the shore dinner, was thoroughly appreciated by both sexes.

## CORRESPONDENCE.

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### THE RETROSPECT.

FORT COLLINS, COLO., September 14, 1911.

*Editors* AMERICAN VETERINARY REVIEW:

The Toronto meeting is now history, and a cursory glance over the events of this meeting gives us much satisfaction. Each annual conclave marks a mile-post in the history of the Association, and at each event we find that we have learned much through the experiences of the past year, and are better qualified to judge of the wisdom of our course for the ensuing year.

I presume that this was the largest, most enjoyable, and successful meeting in our history. The lengthy program made it impossible to discuss papers, and this was a disappointment to many and suggests that in the future if we are to have adequate discussions, the program might profitably be divided into three sections as follows: Section 1, Technical, for laboratory research men; Section 2, Practical, for discussion of things pertaining to everyday practice; Section 3, General, including papers not pertaining to the other sections.

The money appropriated to investigate the Veterinary Colleges, while seemingly inadequate, should be ample to start the work and bring in some reliable information as to what the several colleges are actually doing.

The regulation fixing a minimum requirement for matriculation, while not adequate for the lofty ambitions we cherish for our profession, yet, all things considered, was a fair compromise, and speaks for progress. The adoption of a uniform degree (D.V.M.) was a wise move, and with prejudice laid on the shelf, will not be difficult and will mean much in added prestige to the profession. The Division of Veterinary Science of Colorado State College, has advertised to grant the degree of D.V.S. this year, but since the action at Toronto and by request of the senior class the degree of D.V.M. will be conferred instead.

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The American Veterinary Medical Association has not the legal authority to demand these things, but it has, besides the moral obligation to work for the common good of all, the obligation implied on the part of each and all to remain in good standing, by complying with the requirements of the Association.

Abolishing the impossible Committee on Disease was a good thing, but if my memory serves me right, there were no other committees created to take its place.

In the Associated Faculties meeting a committee was appointed to interview the Post Office authorities in the interest of suppressing Correspondence Schools in the use of the mails.

Much more important, and useful business was transacted at the Toronto meeting. We are certainly under obligation to the local committee for their efforts, and especially to Dr. Grange, who seemed to shoulder the bulk of responsibility. For many reasons we shall not soon forget Toronto.

GEO. H. GLOVER.

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DR. HORACE B. JERVIS, of Houlton, Me., who had his REVIEW go to England last year, while spending some time there, because he felt that he was losing track of things without it, says in renewing his subscription: "Thanks for the remainder duly to hand to-day, and am enclosing my subscription for ensuing year. I predict a larger circulation this year than ever; or at least trust that any veterinarian who has not been subscribing hitherto, will do so *at once*, as he will find it *an invaluable aid to him in whatever sphere his work lies.*"

HAS CONTRACTED THE REVIEW HABIT—Dr. H. E. Myers, formerly a practicing veterinarian, and now a member of the firm of "Myer Brothers and Company," funeral directors and embalmers, Fostoria, Ohio, in renewing his subscription, writes: "Enclosed find check for renewal; have been out of actual practice for two years, but the REVIEW was with me just the same. In fact, I would not want to run a piano store without it."

DR. CHARLES E. CLAYTON, one of the "steadies" at the meetings of the Veterinary Medical Association of New York City, spent some time abroad in the early part of the summer, and looks much improved as a result. The doctor, who had been sort of "peevish" all winter, thought a sea voyage might do him good, and the results have proven the wisdom of his prescription.

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## OBITUARY.

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### HENRY E. TALBOT, M.D.C.

Dr. Henry E. Talbot died at his home in Des Moines, Iowa, on July 18, 1911, from cancer, in the forty-seventh year of his age. Dr. Talbot was born at Pella, Iowa, on November 16, 1864, where he lived until he began the study of veterinary medicine at the Chicago Veterinary College; from which institution he graduated 1895, when he went to Des Moines to enter practice and remained there up to the time of his death. The doctor stood high in his profession, and in the estimation of its members; and was held in high esteem by his fellow citizens. He was president of the Iowa Veterinary Medical Association, and secretary of the State Board of Veterinary Medical Examiners. For many years Dr. Talbot conducted his practice alone, but since January, 1910, had associated with him, Dr. John M. Vernon.

Dr. Talbot was married in 1889 to Miss Elizabeth Burns, of Prairie City, Iowa, who survives him. He is also survived by his father, four brothers, two half brothers and two half sisters. Two of his brothers, Drs. W. W. Talbot, of Pella, Iowa, and Seth P. Talbot, Centerville, Kansas, are also veterinarians.

### GEO. F. McGUIRE, M.D.C.

Dr. Geo. F. McGuire died at his home in Hartford, Conn., on April 12, 1911, of valvular disease of the heart, and complications. Dr. McGuire was a graduate of the Chicago Veterinary College, class of 1894, and has been practicing his profession since that time at New Britain, Conn., where he was associated, at the time of his death, with Dr. B. D. Radcliffe, under the firm name of "McGuire & Radcliffe." He is survived by a widow and a daughter.

### V. L. JAMES, V.S.

Dr. V. L. James died at his home in Middlefield, in August, 1911, in the seventy-first year of his age. The doctor was a highly respected citizen. He is survived by his wife, three daughters and two sons.

## SOCIETY MEETINGS.

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### AMERICAN VETERINARY MEDICAL ASSOCIATION.

With a few introductory remarks President George H. Glover declared the forty-eighth annual meeting of the American Veterinary Medical Association in session, at 10.30 a. m., August 22, 1911, in Convocation Hall, Toronto, Canada, and introduced the Honorable James Duff, Minister of Agriculture, who delivered the address of welcome to Canada.

#### ADDRESS OF HON. JAMES DUFF, MINISTER OF AGRICULTURE.

MR. PRESIDENT, LADIES AND GENTLEMEN—I am very glad indeed to appear this morning on behalf of the government of our province, and to extend to you a very hearty welcome to this beautiful city of Toronto, the capital of the province in which you are now holding your annual convention. I am very sorry that owing to circumstances over which the Prime Minister of the Province had no control, he was unable to be here in person and extend to you a proper welcome to Ontario; but in his absence I am here to perform that duty. I can assure you, sirs, that the people of this province, from one end to the other (and I think I may go further and say that the people of Ontario as a whole), are looking with a great deal of interest upon the work that is being performed to-day by the various veterinary associations and colleges, not only on this continent but elsewhere. I am very glad to hear, sirs, that it was the speech of the principal of our college here in Toronto, Dr. Grange, that was the means of your deciding a year ago to hold this annual convention in Toronto. I shall not be quite satisfied unless, when you have put in your days in session here and finished your business, you again put in several days in seeing this beautiful city, and possibly some of the territory bordering upon it. If you do, I think that you will feel that your trip to Toronto has been well worth while, and that Dr. Grange did not say too much for his province while pleading with you to make it your meeting place for this year.

Veterinary science in our own province has been making splendid strides. Of that I do not propose to speak, except to

say this, that at the present time the government of the province, which took over the old veterinary college (and I might say in that connection that the veterinary college is now fully affiliated with Toronto University), stands in the same relation to it as to the Agricultural College at Guelph, and the various other colleges of which you will see evidences if you walk through this splendid aggregation of buildings in the park which surrounds this great university of this province. Since assuming control (or direction might be a better word) of the veterinary college of this province, we have, under Dr. Grange's superintendency and influence, gone on until we are fast outgrowing the buildings down on Richmond street, and arrangements have been made, and we hope before another year that a beautiful new college building will be erected on University avenue, which will be not only a credit to the city of Toronto, but will be a credit to all those who have taken an interest in veterinary science in the Province of Ontario during the last forty or fifty years. Speaking for the province, I may say that anything that we can do in the direction of aiding and helping on the development of veterinary science in connection with the work as it is taught to-day in the college (either in the old college or as it will be in the new college, the grounds for which have been secured, and on which we are hoping very soon to build), will be gladly extended. It is not a matter for the city of Toronto alone, or for the people of Toronto, but it is altogether a matter of provincial concern, and the people in northern Ontario are equally interested with those in this portion of the province to do everything within reason for the development and uplifting of this school in Toronto, and for the further development of this great science, as it has now come to be, of veterinary work. The eastern provinces of Canada, and the people located in those provinces, are all equally interested in the work which is being carried on in this college. Our entire people now realize the importance of the development of veterinary science, because as time goes on we find, and the people find, that it is very much to their advantage (particularly the people of the profession or occupation to which I have the honor to belong, the agricultural), that the men who go out into the different portions of the provinces, and into our cities, towns and villages, and hang out their shingles; to use a common phrase, that they shall be fully fledged and well-equipped veterinarians; that those men shall be equipped in the fullest possible manner in order to do justice to the people and take care of

their live stock interests, in order that they may render the best service in a professional way to the people of the locality to which they go. I think I am safe in saying that this is becoming more and more apparent; in fact, it has been amply proven, and when we look over what has taken place in the veterinary college here in Toronto during the last five or six years, it is not necessary to look for any further proof.

Now, Mr. Chairman, I do not think I should trespass longer on your time. I wish again on behalf of this great province to extend to you a hearty welcome. The Province of Ontario is, in many respects, the greatest of this great confederation of which we are proud, and we beg to extend to you a royal Canadian welcome, and we sincerely trust that your visit to the city will be of such a character that you will all carry back or away with you, whether you live in the great republic to the south of the international line, or whether you live in some other province or part of the Dominion of Canada, or whether you have come here from some other part of the world, I trust that you will go away from this international convention with a splendid recollection and fond memory of your visit to this beautiful city of Toronto. I again assure you that all over the province the people will take a great deal of interest in your daily deliberations, and I sincerely hope that these deliberations will not only be of benefit to the great organization over which you preside, sir, but will perhaps be of some particular benefit to the veterinary college of this province, under whose auspices you are convened at the present time, and whose guests you will be for the days of your stay in this beautiful city. I thank you. (Applause.)

PRESIDENT GLOVER—Ladies and Gentlemen, as the mayor has not yet arrived, it will be necessary to change our program somewhat. The next will be the President's address. Following that we will hear from Mayor Geary.

#### PRESIDENT GLOVER'S ADDRESS.

FELLOW MEMBERS OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION AND FRIENDS—Two years ago Dr. J. G. Rutherford, in the course of his address as president of this association, remarked as follows: "In now acknowledging your kindness in this regard (electing him president) I do so with the full acknowledgment and realization of the fact that the honor was bestowed as an act of international courtesy toward my country,

and not because of any particular worth or merit of mine." Now, I presume that our worthy brother would insist that our meeting in Canada is purely a matter of international courtesy. If so, I wish to inform him that he has allowed his generosity to influence his judgment in these matters; for while those of us living south of a certain geographical line desire to extend every courtesy to those north of it, yet the real facts in the case are that the brother was elected to this office because of personal merit, and we are here on Canadian soil because we were extended a most cordial invitation, because we wanted to come to the beautiful city of Toronto, and because we have previously enjoyed a taste of Canadian hospitality.

I have a warm place in my heart for Canada, for it was at a previous meeting in Canada that I was elected to membership in this association, and what is to me even more eventful, when I sought a wife I was obliged to forsake my native land, as a "forlorn hope," and sojourn to Canada.

In times gone by some of our people, with more enterprise than morals, I am sorry to say, have experienced a sudden and resistless desire to make a hasty departure, under stress, for Canada, but reciprocity has now made it so difficult for a fugitive Yankee to hide his head in Canada that he may as well stay at home and take his chances.

That reciprocity may be effected between the two countries which will be far-reaching in trade and mutually advantageous, is a "consummation devoutly to be wished"; for we are neighbors, we speak a common language, we are actuated by similar motives, we are inspired by the same laudable and innate love of home and native land, that and in the drama of life we are alike acting our part as best we can. In a larger sense, we are more than countrymen, we are cosmopolitans, "heirs of a common heritage, children of the self-same God."

We are proud of our chosen profession and the progress that it has made. The progress of civilization has been slow and the race has suffered and died because of ignorance of the "things which God hath prepared for them that love Him," but we have been gaining momentum of late, so many of nature's hidden mysteries are revealed and such a vista of possibilities greets our eager eyes that we are wont to speculate, and perhaps overestimate, what the future has yet in store for us.

Man has progressed just to the degree that reason has dominated his animal instincts, just in proportion as he has ceased to

fear and place sole reliance upon things metaphysical, acquired faith in himself and sought the physical causes of his troubles and met them with physical means, as he has outlived seances and learned something of the sciences, just as he has ceased to grovel in impending doom and gotten his mind on pending facts, just as he has gotten out of the realm of mythology and looked squarely at the facts of biology, just as he has learned that superstition, fear and hate are the twin brothers of ignorance and that love, with its attributes of faith, industry and self-reliance, conquereth all things.

Harmony is the prime essential to strength in any institution, and to this factor must be attributed, more than to any other, the rare interest and splendid growth of the American Veterinary Medical Association. This association has been the alma mater to the veterinary profession in America, and as such has wisely directed its educational and ethical trend. We are becoming a large organization, our membership is increasing rapidly, likewise our expenses. Our literary program might be profitably extended and this can be easily done by dividing the meeting into sections, as was inaugurated last year at San Francisco. Some of our members, and many would-be members, complain of a dearth of practical discussions, and for this reason they have failed to attend our meetings. To satisfy this charge, which perhaps has some justification, I wish to suggest that one section of the program might be devoted to a practical discussion of cases met with in every day practice. As our association has grown in membership, the volume of business to be transacted in open session has increased to such an extent that much of our valuable time has been given to petty business details that might appropriately be transacted in committees. The posting of names of candidates, instead of reading them, will save some time, and it is to be hoped that members will aid as much as possible in facilitating business and not hamper it by long contention over matters of minor importance. The work of the publication committee has grown in volume until it is seemingly unfair to ask this service of any of our members without compensation. I, therefore, wish to recommend that in the future an annual salary of \$350 be paid to the chairman of this committee, and that a like amount constitute the salary of the secretary of this association.

It is apparently useless in a brief address like this to undertake a discussion of the history of veterinary medicine; we have

been making great strides forward, but as yet have scarcely a glimpse of the mysteries of nature's complex processes. Let us for a few moments briefly review some of the things of special significance apropos of the time and occasion.

I think you will agree with me that the interest of the profession to-day is directed largely toward immunity, to the utilization of the body defenses in preventive and curative medicine. Following the pronouncement by von Behring, in 1892, of the discovery of antitoxins and the promulgation of the theory of phagocytosis by Metchnikoff, came the inevitable inquiry as to the unaccountable leucocytic activity in some cases and its absence in others. This has been explained by the theories that there are substances in the fluids of the body called alexins which constitute the important factor in opposing bacterial invasion; the discovery of opsonins, which prepare the way for phagocytic activity, and the theory of aggressins, which are supposed to act by negative chemotaxis upon leucocytes. In fact, the study of the blood has afforded such a fertile field for scientific adventure and with promise of such an abundant and early fruition that investigators seem, in some instances, to have wandered into the labyrinth of mere hypothesis. One ultra conservative writer in speaking of antibodies says: "Not until antibodies and their antigens have been brought under the dominion of weights, measures and chemical formulæ; not until their chemical and physical properties have been ascertained by methods lying outside biology, shall we be able to feel sure that we are dealing with things and not with phantoms." On the other hand, the therapeutical value of antitoxins, vaccines, serums and bacterins has been proved in actual practice and supports the theories in many cases which underlie them. In the face of past achievements and in the light of our present knowledge, it certainly is no idle dream to predict that the time is coming when it will be possible to build up the body defenses against any and all bacterial diseases. Our work must go forward by three parallel and seemingly equally important lines; first, combating disease wherever found and by every known agency; second, fortifying the body by its natural defenses and other agencies; third, waging a relentless warfare against pathogenic micro-organisms.

While interest in serum-therapy has been largely monopolizing the profession, we must not overlook the achievements in chemo-therapy. The most noted example of this newer therapy is the arsenical compound "606" of Ehrlich. The outcome of

certain combinations of "606" in the treatment of protozoan diseases will be watched with interest. The claims of 1 to 1000 solution of chinosol in tuberculosis, and of benetol inhibiting the growth of organisms in the animal body, are not so well established but will bear watching. The vastly overestimated value of drugs in the treatment of disease was a relic of mediæval superstition and belief in magic. The reaction which threatened to carry it to the other extreme has been gradually giving away in the light of modern science to an increased confidence based on a more enlightened and conservative therapeutics.

It is only in recent years that we have surmised the full significance of parasitism. It has now been proved that many parasites, especially worms, give off poisonous chemic substances. fluids from the cysts of certain larvæ have been found extremely poisonous when injected into the bodies of experimental animals; uncinariæ, as well as other forms of intestinal parasites, especially those belonging to the strongyli family, not only rob the host of blood and nutrients, but poison their host by products given off from their bodies. These toxic products cause eosinophilia, and in some case cloudy swelling, focal necrosis and death.

In surgery we have marked great progress, but we are now and must continue to be content with second place in major surgery. We cannot reasonably deny this fact when we stop to consider that practically all major operations on the human are performed in well-appointed hospital, while in our subjects, their removal to even such hospitals as we have is scarcely practicable; their lack of intelligence causes disastrous interference, their bodies are covered with hair, and the incentive for our services is largely pecuniary. Progress in the science of surgery is especially noted in asepsis and antisepsis, surgical technic, in safe anesthetics adapted for different kinds of animals and in fortifying the body for operation by the body defenses and other means.

Reports from many sections of the country show an alarming increase of rabies. In England rabies was stamped out, largely by compulsory muzzling of dogs. In this country, a doubt fostered by some misguided medical confrères as to the reality and importance of the disease, combined with a maudlin sentiment for the dog, has made the enactment of muzzling ordinances in most cases impossible. The success of the Pasteur treatment can no longer be reasonably questioned. An antirabic vaccine

for the preventive treatment of rabies in both the human and lower animals is on the market.

Hog cholera continues to be the great scourge among hogs wherever the hog raising industry is carried on extensively. In spite of the fact that several of the state experiment stations, some private firms and biological houses have been manufacturing hog cholera serum, yet not enough has been available to supply the demand. The laboratory claims for this serum have been fully substantiated in the field as indicated by the unprecedented demand for it.

More vigorous steps are being taken by the United States Department of Agriculture and vast sums of money have been spent to eradicate the southern cattle tick. What the consummation of this laudable undertaking would mean to the cattle industry of the south can hardly be estimated.

Dr. N. T. Ferry reports the discovery of the specific organism of canine distemper. This he has named bacillus bronchicanis. Dr. J. P. McGowan, of the Royal College of Physicians' Laboratory, Edinburgh, has confirmed the finding of Dr. Ferry.

While it has been suspected in a general way that tuberculosis existed to an alarming extent among cattle and increasing rapidly in hogs, yet we have never until quite recently been in possession of statistics that gave us any reliable basis for definite calculation as to the extent of the disease and the economic loss which it has entailed. The United States Bureau of Animal Industry report for 1908 gives tabulation of 400,008 cattle tested for tuberculosis by federal and state officers, with 37,000 reactors, or 9.25 per cent. Of the reactors, 24,984 were slaughtered and 93.39 per cent. were found tuberculous. Statistics like these are invaluable and give us a more definite understanding of the magnitude of the problem confronting us. From many sources the propaganda of education is reaching the people and having its effect. Federal, state and municipal laws looking to the control of tuberculosis, if too far in advance of the people, will not be enforced, but are in themselves educational. From many sources come evidences of a stronger determination to wage a relentless warfare against the bacterium tuberculosis along scientific lines. The reliability of the ophthalmic test is questionable. The intradermal test, if its reliability could be assured, would have many practical advantages. The subcutaneous tuberculin test is one of the great discoveries of modern times; without it we should be helpless in fighting this disease; with it we feel

that the divine hand has pointed out the way. Faith in the reliability of the tuberculin test is no longer questioned save in rare instances of the rankest prejudice.

Several investigators of repute are working with equine infectious anemia and progress made in the last year in determining the etiologic factor and means of control has not been very encouraging. An important thing in this connection is the report of Dr. L. Van Es, in regard to the transmission of infection through the urine. The reported increase in prevalence of this disease is not substantiated, and is probably due to the fact that the disease is more easily and therefore more generally recognized.

While most of the states have appropriated liberally for the eradication of glanders, the disease still prevails. The reason for this lies essentially in the fact that glanders is an insidious disease, and from its nature is seldom recognized save in the typical form and in the last stages. Wonderful progress has been made in the diagnosis of glanders and which portends its early recognition and probable control. At the present time we have several more or less reliable methods of diagnosing glanders. As I remember them, these methods have been revealed in about the following order: First, diagnosis by clinical symptoms and the macroscopic and microscopic study of lesions; second, auto-inoculation; third, the inoculation of the guinea pig, producing orchitis with chancroid lesion; fourth, the anaphylactic reaction following the injection of mallein; fifth, the agglutination method (Widal reaction), which means briefly, clumping or agglutination caused by a chemic substance in the germ called agglutinin with another chemic substance in the serum called agglutigen; sixth, the discovery of precipitinogen formation in the blood, stimulated by precipitin contained in the product of the germ; seventh, the Wasserman reaction, or fixation of the complement. Of these several methods, representing the highest degree of technical laboratory research, it is to be hoped that a practical and reliable method has been found for the certain diagnosis of glanders in all stages and under all conditions.

Statements have been made in newspapers and magazines, and recently in one or two scientific journals, assuming that there might be a possible relation between pelagra of the horse and the same disease in man. Having been a close observer of diseases of the horse for several years, and questioning the reality of such a disease in the horse, effort was made to trace

the authority for this assumption, but without success. To assume that poisoning of the horse by pathogenic fungi or the toxins of any organism associated with food simulates pelagra in the human is going farther, it seems, than the profession is willing to go at this time.

Dr. B. F. Kaupp reports the presence of two forms of the so-called white diarrhoea of chickens in the middle west; the bacillary white diarrhoea caused by bacterium pullorum, and the coccidian white diarrhoea due to coccidium tennellum. Both of these organisms have been isolated and both types of the disease studied.

In the realm of toxic herbage very little has been done of late aside from the naming and identification of plants which have been suspected, by observation, of being poisonous. The loss of live stock from poisonous plants, especially on the open ranges of the west, is very heavy. Several species of the so-called "loco" weeds are proven to be poisonous to horses, cattle and sheep, but the identification of the toxic principle remains a mystery and a satisfactory remedy, as well as a practical solution of the problem, has not been found. Larkspur (delphinium) continues unchecked to exact an annual toll of several millions of dollars in live stock (mostly cattle) in the mountainous districts. Species of cicuta, zygadenus, lupinus, the leaves of wild cherry, cane and Kaffir corn, and many others are poisoning animals at their own particular season of the year. The Wyoming experiment station is investigating the woody aster and its disastrous effect upon sheep. The loss from poisonous plants, in the aggregate, runs into millions of dollars every year, and its economic importance and scientific interest should appeal for a wider and more persistent investigation.

An address like this that did not make mention of the splendid achievements and the far-reaching influence of the United States Bureau of Animal Industry and the Canadian Health of Animals Branch would certainly be doing a gross injustice to these organizations. These governmental departments have won the confidence of the members of this association, the people of this continent and throughout the world, by their untiring devotion to the cause of conserving the animal wealth and protecting the public health.

A retrospect of fifty years in sanitary science affords us much satisfaction and much to be proud of, but the work is only fairly started. When we think of what has been accomplished in the

knowledge and mastery of yellow fever, cholera, bubonic plague, Texas fever, hookworm disease, diphtheria, anthrax, hog cholera, in surgery and in prophylaxis and curative medicine, we feel confident that no other branch of science has done so much for mankind, and while the world is coldly appreciative, the reward must come essentially in the satisfaction of achievements wrought in the cause of humanity.

The greatest problem of all, however, continues to baffle us. We knew the cause of tuberculosis; we know how to detect it in animals; we have an ample knowledge of its extent, its stupendous economic significance and the terrible tax it levies on human life. With a fair knowledge of what ought to be done, and with much earnestness and fixedness of purpose, we are still hesitating and in confusion, waiting for some genius who can evolve a plan of campaign which will afford some hope of final success. Every plan suggested has met with obstacles. We have tried legislation, but the people are not ready to co-operate. Must we in the light of our present knowledge and inability to perform, witness the terrible destruction from this disease indefinitely? Until we are ready to pave the way by recommending a feasible and systematic plan of campaign against it, we cannot justly claim the indifference of the people as sufficient cause for inaction. Until the public are aroused from their lethargy and come to a greater appreciation of its importance, we cannot expect that the selfish opposition will be removed. Let the campaign of education go on through every known agency and every member of this association consider it his moral duty to proclaim, by voice and pen, the gospel of co-operation in fighting this arch enemy of animal life. Members of tuberculosis commission, we are expecting much from you, at the same time we fully appreciate the size of the task you have in hand. Your splendid report one year ago helped to clear the horizon and direct our progress. Possibly you can help us now more by recommending a practical plan for united effort than you can by technical research.

I scarcely know what to say about matriculation requirements and a uniform degree. You know that these subjects are very close to my heart and that I consider them paramount, otherwise I would not for the last three years have always been found "harping on one string." I have not the time again to take up a review of these subjects. Since our last meeting there has been much discussion along these lines; and in the AMERICAN VETER-

INARY REVIEW, have appeared two notable articles, one by Dr. D. Arthur Hughes and the other by Dr. Olof Schwarzkopf, each apparently assuming that the two problems are so intimately associated as to be practically inseparable, but at the same time giving most of their attention to the problem of a uniform degree. After reading these very careful and exhaustive discussions of the subject one can scarcely fail to be impressed with the absurdity of our present position and the predicament in which we find ourselves. Gentlemen, the ease with which we pave the way for men to enter this learned profession, and then reward them with a multiplicity of easily earned titles, lowers our standing with other professions, lowers the appreciation of our graduates for such titles, and has a far-reaching demoralizing influence both in the profession and out. In the matter of higher matriculation standards for our veterinary colleges, there is a commercial consideration which makes it difficult; but gentlemen, there is a way of solving this perplexing problem without great material injury to anyone, and there is only one basis upon which it can be satisfactorily adjusted, and that is, "the greatest good to the greatest number." I do not believe that there is a person within the sound of my voice that does not in his heart believe in higher standards and educational righteousness. I am equally confident that all will agree that the weakest link in our educational chain is matriculation requirements. Then why not advance the requirements for matriculation by easy stages and not take the chance of doing any school great material injury by exacting the maximum of high school graduation, or because this appears revolutionary and conflicts with private interest, adopt the alternative, as we have in the past, and do nothing. It is a deplorable fact that so many men knocking at the doors of our veterinary colleges have not the basic training which in any manner fits them for a professional course. Some of these applicants seem to be possessed with the one idea of "serving their time," hoping at the end to obtain the doctor's degree which will entitle them to practice the art of veterinary craftsmanship. In such cases, education for its own sake, for a richer and more abundant life, does not appeal. It would seem that it is now time that we assumed an attitude which will definitely determine whether we stand for the profession of veterinary medicine or the business of veterinary medicine. While this perverted and deplorable conception of the true value of an education exists, students will naturally rush to schools where the course of study

is short and entrance conditions are easy. Were these schools to advance their entrance requirements to five unit credits, then other schools of medium requirements would feel justified in raising their standards proportionately, and the relative conditions which appeal for students would not be altered materially.

In order that a college may enjoy the retiring benefits of the Carnegie Foundation, it must not only require fourteen unit credits from a standard high school, but it must prove its educational righteousness in performance as well as in advertised requirements. In the third annual report of the Carnegie Foundation for the Advancement of Teaching I find the following: "The purpose of the Carnegie Foundation is to further as far as possible the cause of educational unity. It cannot therefore have one standard for college entrance in New York and Iowa and another in North Carolina and Texas. Under any conception of educational organization the college should rest on the standard high school, and when that standard is uniform throughout the nation then we hope to move the point of admission to colleges up or down as may seem wise." From the same report I find the following admonition: "Educational righteousness begins in honesty and sincerity and no system of insincere requirements for admission can be considered as an educational gain." "There is no method by which the Foundation can be sure of the impartial enforcement of the published entrance requirements of a given college except by a detailed examination of the actual practice in the admission of students, and this will be made in the case of institutions admitted to the accepted list."

When I think of what the requirements are for recognition by the Carnegie Foundation, of how many colleges are accepted by them, of how far we, in several instances, fall short of these requirements, of how we as a learned profession seek public recognition upon our merit, of how in the midst of these high educational standards we hesitate to adopt a minimum requirement of even five high school credits, I wonder whether we have not, like the man of fiction, gone into a twenty-year slumber.

The great things of the world have been achieved by those individuals who had faith in themselves, and who had a problem. As an association we should have the faith in our cause and the pride in our chosen profession which will at all times keep us alive to the progress of the world. To fail to keep step with the onward march of progress means to fall back in the procession, with discredit and dishonor. Surely there is no nobler

calling than ours, yet we are constantly humiliated by being ignored in matters where we should be an authority, and our profession is the victim of odious inferences as to the dignity of our true mission. For these things we have no one to blame but ourselves. The business of making a trade out of our profession remained too long. Progress is a law of nature and established precedent obstructs the way.

Gentlemen, this is the most vitally important problem affecting the welfare of our beloved profession to-day; our pedagogic machinery is creaking from dearth of the oil of preparedness and commercialism will not release the brakes. May we not delay action longer, but at this meeting do something that will, in a slight measure at least, indicate that we are alive to the progress of the times in everything pertaining to education?

In the matter of a uniform degree for veterinary colleges the difficulties in the way are not so great and seem to melt away by careful analysis. This may not be so true of Canada as the United States, and while one degree for each of these countries would be an improvement over present conditions, those who read the "handwriting on the wall" are looking forward to an international uniform degree. The Orient represents the one extreme of conservatism never having until recently conferred the doctorate degree on veterinarians. On this continent we have gone to the other extreme of giving away degrees, seemingly forgetting that a diploma is worth just what it cost in study, and not in money, to the recipient and in service to the public. As a result of this folly our graduates are not generally recognized in the Orient, and we receive their graduates with open arms. Germany and Prussia will now confer the doctorate degree upon their graduates in veterinary medicine. France and other European countries will naturally follow. Now, let us show them that we are alive to this world movement by doing our part. The degree of Doctor of Veterinary Medicine is the particular degree which seems to meet with more general approval. It is substantially the degree adopted in Germany and Prussia (*Doctor Medicinæ Veterinariæ*; *Dr. Med. Vet.*), has recently been adopted by the Federation of American Veterinary Colleges, has been approved by the Missouri Valley Veterinary Medical Association, and will be up at this meeting for consideration. The University of Toronto confers two degrees, B.V.Sc. and D.V.Sc., the latter to be obtained upon proof of a higher educational standard and prolonged professional study. Two degrees

in veterinary science corresponding to the degree of Bachelor of Science (B.Sc.) and Master of Science (M.Sc.) is reasonable and commendatory, but had not better claim our attention for some future time.

It is not too early, however, to consider the proposition of conferring honorary degrees upon the worthy members of our profession. We have in our American veterinary profession several men who in faithfulness, professional attainment and scientific achievement are worthy, and why should we not honor them while they are living? Let us not keep the alabaster boxes of our love and esteem sealed until our friends are dead, rather let us anoint them before their burial. Post-mortem kindness does not cheer the troubled spirit, and flowers on the coffin cast no fragrance backwards over life's weary way.

Gentlemen, I must appeal to you in another matter. There is a half-heartedness, a lukewarmness in our attitude towards the ignoble and pitiable plight of the veterinarians in the United States Army. As long as the people of the United States, and particularly those who cultivate the amenities, gentility, social grace, and treasure the best elements in character, know that the veterinarian in the army has no official recognition, whatever be his intellectual, moral or social qualities, just so long will there be a stigma upon us, and just so long will we be forbidden recognition on terms of equality with members of other professions. We must have justice in this matter, and to accomplish this we must still further prove our worthiness and command an undeniable respect by getting together on a higher educational basis and by making this organization a power that cannot consistently be ignored. Let us keep up the fight and appropriate more money, if necessary, that we may keep our representatives knocking at the doors of Congress, presenting our claims, and refusing to be denied our just recognition.

Gentlemen, these problems will be before you at this meeting and will claim your candid and serious consideration. We are bound together by a moral obligation, which among men of our standing should be looked upon as even more sacred than a legal compact.

May we make this, our second meeting in Canada, and at the seat of the pioneer college of America, memorable by good fellowship and substantial achievements. Thought is becoming more powerful and power is becoming more thoughtful, and men are everywhere learning the need of co-operation; they are beginning

to sing in chorus the great solos of the world and to appreciate as never before that mutual helpfulness makes for mutual happiness and success. The restless spirit of the times should cause no pessimistic apprehensions; it is simply the result of breaking away from old lines of thought and the awakening of the people to independent and individual thought. It is the extension of the freedom of thought made conspicuous by Darwin and others; the people thinking for themselves instead of blindly following the beaten track of others. Ideals are being reconstructed, not destroyed, and along with this independence of thought is a growing desire to co-operate, to be kind and mutually helpful. (Applause.)

At the conclusion of his address, President Glover introduced the Hon. George R. Geary, Mayor of the City of Toronto.

#### MAYOR GEARY'S ADDRESS.

MR. PRESIDENT, AND LADIES AND GENTLEMEN—It was my good fortune this morning to be a little late, because it gave me the opportunity of hearing the remarks of your president, thus giving me some idea of the basis of this organization and of the spirit in which the organization desires to progress and to make of itself something better even than it is at the present time, or as it was, I imagine, in its original state. We in Toronto have been particularly attached to this profession of yours for a great many years. I think our college is one of the oldest of all the veterinary colleges. Perhaps the oldest. I do not know, but I know that we could always depend upon our university for turning out good men, well-trained men in the veterinary profession. The veterinary department is now one of the well-qualified departments of our university activity, and it has attracted to its courses some pretty sturdy fellows, I can tell you. I think, probably, and at all events, the backbone of the football team has usually come from the veterinary college. Dr. Andrew Smith, who was actively connected with the department until within the last three or four years, was probably the most respected citizen of Toronto, and was one of the very finest men that we have ever had in the city. He commanded both respect and admiration, and under his care and management the veterinary college attained a very high stand and maintained it through many years.

Mr. Duff, the Minister of Agriculture, I believe, has given you a welcome to the Province of Ontario, and has told you some-

thing of the connection of the veterinary school with the university. The school of veterinary science, as I understand it, is affiliated with the university or college, and it is now a part of the university. The University of Toronto is certainly a university that they should be proud to be affiliated with. The University of Toronto is a state institution, and I think that all visitors to this city, and this convention, will feel that their professional interests are being taken good care of inasmuch as the school in which you are more particularly interested is affiliated with the University of Toronto, and thus commands the attention and assistance of the Canadian Government and the active support of the Province of Ontario.

Some time ago, some months ago I believe it was, Dr. Grange of this city, who has been very active in your behalf, intimated that possibly we could get this great convention to come to visit us. He went to San Francisco. He was armed with our invitation, and with our authority to say to you all that he might wish to say to you in order to induce you to come. We were indeed very much pleased, and in fact more than pleased, when he reported that he was able to say that you had decided to do us the honor of holding your next annual convention in this city. I assure you that we were delighted to receive that information, and are glad indeed that you are with us. Many of you are from the United States, with which we are at the present moment engaged in discussion regarding some matters that have to do with trade relations between Canada and the United States. (Laughter.) I do not think that I need enter into a discussion of that particular matter any more than to say that no matter whether the policy of "get-together" or "don't-get-together" prevails we can readily believe that for all time to come there will be no doubt as to the beneficial effect of the policy of reciprocity in friendship and affection between the two peoples (applause), and that although our relations will, in all probability, remain as they are to-day, we can count, for all time to come, no matter what may be the result of these agitations which are now going on, upon a continuance of the policy of hospitality and kindness, and beautiful respect and admiration will always be of the friendliest and kindest nature between us. (Applause.)

The city of Toronto gets its name from being the meeting place of the tribes of Indians who formerly inhabited this portion of the country. I understand that in the days before there was very much business done here that they had conventions of gentlemen decorated in all of the insignia of war that their limited

knowledge enabled them to put upon themselves, and that they came here not only for purposes of that kind, but on other occasions that they came here for peaceful purposes and for social enjoyment. That good old custom has been continued, and today Toronto is the scene of many conventions of different societies. We are always glad to see them, and just as often as they go we wish that they may soon come back. We look forward with anticipation and pleasure to having you come back, and we shall look back to your visit and regret that you have not been able to come before, and shall look forward with anticipation and with the hope that at some future time you may again do us the honor of making Toronto the place for holding your annual meeting. The citizens of Toronto, I know, are more than glad to have their executive officer appear and greet your convention, and if I were in possession of any of the old customs or materials so that I could present in some concrete form what was called in other days the freedom of the city, I assure you I would do it very gladly indeed. I can, however, go this far and say to you that there may be some things that you will see that you will like, and you may use your discretion about taking them. At all events it will be very likely that if you do so you will be given every opportunity of having it overlooked. (Laughter.) I know that conventions composed of men in one of the learned professions are not conventions to which perhaps the ordinary forms of entertainment appeal. I think, however, that we will be able to show you that we have a good town here and hope that you will believe us in the statement that it is going to be a very great town, and perhaps the greatest town on the continent of North America, as the years go by.

Now, I hope the ladies and gentlemen who are here will have a very pleasant time in the city, that good results will come from your labors in the interests of your profession, in the general results achieved by the convention, and I hope to see this great profession still further advanced as the result of your efforts, that your interests may be safeguarded and may be advanced materially and in character, and this association will do a great deal, I am quite sure to place the profession of veterinary medicine in the position to which it is entitled, and which I think it has, in a great many directions, already attained in a very marked form. Some of our very best citizens are in your ranks, of whom we are very proud, and I am sure that this very representative gathering is entitled to our respect as it surely is to our warmest welcome to Ontario and Canada. (Applause.)

President Glover then requested Dr. V. A. Moore to respond to the addresses of welcome given by the Minister of Agriculture and the Mayor.

DR. MOORE'S RESPONSE.

MR. PRESIDENT, MR. MINISTER OF AGRICULTURE, MR. MAYOR, LADIES AND GENTLEMEN—On behalf of the members of the American Veterinary Medical Association I have the privilege and the honor of extending to you, to your government and to the citizens of Toronto our sincere thanks for your most cordial and gracious welcome. In reply to your timely words of appreciation of the veterinary profession I wish to say that its members here are exceedingly grateful. This is the youngest in America of the so-called learned professions. Because of this it has been and still is confronted by many perplexing problems, in carving its place of highest usefulness in these great countries. It has grown from the few men who gathered around John Bustied and Alexander Liautard in New York, and a half dozen men who surrounded Andrew Smith in Toronto, more than half a century ago, to a profession numbering many, many thousands. In the beginning it dealt simply in treating the sick and the injured. To-day in addition to its earlier duties it looks after the many and complicated tasks of preventing epizootics and safeguarding the human family from the plagues that come to it through the dumb creation.

We are gathered here in the spirit of true reciprocity. We have come from nearly if not every state in the Union, from across the seas and from nearly if not every province in this great country of yours. We have come with treasures consisting of tried and carefully correlated experience in the human effort to relieve suffering and to control epizootics and other diseases. In the marts of commerce such treasures would bring the highest price, but these men have come, some great distances, each to give to others that which he possesses and to take in exchange from the experience of others that which he can assimilate and apply. Where among statesmen, philosophers, or in the realm of commerce can be found a better example of genuine reciprocity?

It is very fitting that this association should meet from time to time in your city. Up to 1905, more than half of the veterinarians in the United States and Canada received their professional training in Toronto, at the school which is held in

such high esteem by so many of the profession. Toronto, therefore, is the widest known center for veterinary education in America. This association brings its greetings and congratulations that the school established by private enterprise has become affiliated with a great university, where it will receive that stimulus for better and more efficient work which comes only with the introduction of the true university spirit. In earlier times this was not thought to be necessary for the veterinarians, but the hour has come when the mysteries of the laws of nature that have been revealed in the many causes of disease, the specific reaction of animal tissues to irritants, the intricate interlacing of susceptibility and immunity, together with the delicate balancing between normal and abnormal physiology, demand an extent of scientific training and mental discipline for the veterinarian not excelled by any of the other professions. For this reason we rejoice in the plans for the future scientific development of our host, the time-honored Ontario Veterinary College.

As the members of this association gather from year to year there is a growing appreciation of the duties, the responsibilities and the obligations of the veterinarian as a professional man. Its members have grown out of petty jealousies and selfish interests and assemble at these great annual gatherings for the purpose not only of acquiring information by which to increase their efficiency as practitioners of medicine and surgery, but also to ascertain more clearly those things which they can do to enhance their value as loyal citizens in this great warfare against disease.

With these few brief statements as to the kind of men we are, and the purpose for which we are here, I wish to extend to you and to the citizens of Toronto interested in this work a most cordial invitation to attend our deliberations and to assure yourselves of the real spirit, the purpose, and the genuineness of the modern veterinarian. I again assure you of our appreciation of your welcome and congratulate the association on the privilege of meeting under such delightful auspices.

#### THE ATTENDANCE.

The attendance at the Toronto meeting exceeded that of any previous occasion. Space will not permit of its publication in the present issue, but it will appear in the succeeding issue.

*New Members.*

ARKANSAS—Stanford, John Fred, M.D.V., Fayetteville, Ark. (McKillip Veterinary College, 1908); voucher, R. R. Dinwiddie.

CALIFORNIA—Almeida, Anton S., D.V.S., Dixon, Cal. (San Francisco Veterinary College, 1909); vouchers, C. M. Haring and A. R. Ward. Ast, Jacob F., D.V.S., San Francisco, Cal. (San Francisco Veterinary College, 1907); vouchers, Charles Keane and David F. Fox. Bergh, Hennig E., D.V.S., Suisun, Cal. (San Francisco Veterinary College, 1909); vouchers, Charles Keane and David F. Fox. Boyd, James, D.V.S., Milpitas, Cal. (San Francisco Veterinary College, 1907); vouchers, Charles Keane and David F. Fox. Brown, Charles W., D.V.S., McCloud, Cal. (San Francisco Veterinary College, 1910); vouchers, Charles Keane and W. E. D. Morrison. Caldwell, Wm. A., D.V.S., Edgewood, Cal. (San Francisco Veterinary College, 1908); vouchers, Charles Keane and David F. Fox. Cram, V. E., D.V.S., Calexico, Cal. (Colorado State College, Veterinary Department, 1910); vouchers, David F. Fox and W. E. D. Morrison. Fallon, Edward J., D.V.S., San Francisco, Cal. (San Francisco Veterinary College, 1908); vouchers, Charles Keane and David F. Fox. Gordon, George, D.V.S., Hanford, Cal. (San Francisco Veterinary College, 1904); vouchers, Charles Keane and David F. Fox. Haney, William F., D.V.S., Modesto, Cal. (San Francisco Veterinary College, 1910); vouchers, Charles Keane and David F. Fox. Hogarty, John J., D.V.S., Oakland, Cal. (San Francisco Veterinary College, 1900); vouchers, R. A. Archibald and Charles Keane. Iverson, John P., D.V.S., Sacramento, Cal. (San Francisco Veterinary College, 1906); vouchers, Charles Keane and David F. Fox. Koch, Julius, D.V.S., Los Angeles, Cal. (San Francisco Veterinary College, 1910); vouchers, Charles Keane and David F. Fox. Lang, August R., D.V.S., Porterville, Cal. (San Francisco Veterinary College, 1909); vouchers, Charles Keane and R. A. Archibald. Longley, Otis A., D.V.S., Fresno, Cal. (San Francisco Veterinary College, 1903); vouchers, Charles Keane and David F. Fox. McCarthy, Chas. F., D.V.S., San Francisco, Cal. (San Francisco Veterinary College, 1901); vouchers, Charles Keane and R. A. Archibald. Nielson, Norman, D.V.S., Cohisa, Cal. (San Francisco Veterinary College, 1903); vouchers, Charles Keane and David F. Fox. O'Rourke, Michael J., D.V.S., San Francisco,

Cal. (San Francisco Veterinary College, 1909); vouchers, Charles Keane and David F. Fox. Outhier, C. B., D.V.S., Salina, San Francisco, Cal. (San Francisco Veterinary College, 1902); vouchers, Charles Keane and R. A. Archibald. Petersen, Theo. J., D.V.S., Visalia, Cal. (San Francisco Veterinary College, 1902); vouchers, Charles Keane and David F. Fox. Price, Charles E., D.V.S., Santa Ana, Cal. (San Francisco Veterinary College, 1906); vouchers, Charles Keane and David F. Fox. Pullin, John H., D.V.S., Santa Ana, Cal. (San Francisco Veterinary College, 1910); vouchers, Charles Keane and David F. Fox. Quinn, James E., D.V.S., Antioch, Cal. (San Francisco Veterinary College, 1910); vouchers, Charles Keane and David F. Fox. Ramsey, Wm. J. C., D.V.S., Watsonville, Cal. (San Francisco Veterinary College, 1908); vouchers, Charles Keane and David F. Fox. Pace, John C., D.V.S., El Cintio, Cal. (Colorado State College, Veterinary Department, 1910); vouchers, W. E. D. Morrison and David F. Fox. Rey, George S., D.V.S., Visalia, Cal. (San Francisco Veterinary College, 1909); vouchers, Charles Keane and David F. Fox. Riordan, Wm. F., D.V.S., Gilroy, Cal. (San Francisco Veterinary College, 1906); vouchers, Charles Keane and Wm. M. MacKellar. Rosenberger, Guy W., D.V.S., Hanford, Cal. (San Francisco Veterinary College, 1906); vouchers, Wm. M. MacKellar and Arthur Paul. Small, Anthony W., D.V.S., Hayward, Cal. (San Francisco Veterinary College, 1910); vouchers, Charles Keane and David F. Fox. Struthers, Chas. E., D.V.S., Willows, Cal. (San Francisco Veterinary College, 1908); vouchers, Charles Keane and David F. Fox. Taylor, George C., D.V.S., Redding, Cal. (San Francisco Veterinary College, 1906); vouchers, Charles Keane and David F. Fox. Ward, George R., D.V.S., San Francisco, Cal. (San Francisco Veterinary College, 1904); vouchers, Charles Keane and David F. Fox.

COLORADO—Busman, V. S., M.D., Denver, Colo. (Ontario Veterinary College, 1895); vouchers, B. F. Kaupp and George H. Glover. Yard, Wm. W., D.V.S., Denver, Colo. (American Veterinary College, 1894); vouchers, George H. Glover and G. W. Dickey.

CONNECTICUT—Gilyard, Arthur T., D.V.M., Waterbury, Conn. (New York State Veterinary College, 1907); vouchers, G. W. Loveland and Thomas Bland. Keresev, Dennis R., B.V.Sc., Danbury, Conn. (Ontario Veterinary College, 1910); vouchers, Thomas Bland and G. W. Loveland. Todd, Robt. S., D.V.S.,

New Milford, Conn. (American Veterinary College, 1893); vouchers, G. W. Loveland and Thomas Bland.

DISTRICT OF COLUMBIA—Brett, George W., D.V.M., Washington, D. C. (George Washington University, Veterinary Department, 1911); vouchers, E. C. Schroeder and John R. Mohler. Cotton, Wm. E., D.V.M., Washington, D. C. (George Washington University, Veterinary Department, 1911); vouchers, E. C. Schroeder and John R. Mohler. Graybill, Harry W., D.V.M., Washington, D. C. (George Washington University, Veterinary Department, 1911); vouchers, B. T. Woodward and Adolph Eichhorn. Hicks, Tunis, D.V.M., Washington, D. C. (George Washington University, Veterinary Department, 1911); vouchers, B. T. Woodward and Adolph Eichhorn. Koon, George H., D.V.M., Washington, D. C. (George Washington University, Veterinary Department, 1911); vouchers, B. T. Woodward and Adolph Eichhorn. Shore, Howard J., D.V.M., Washington, D. C. (George Washington University, Veterinary Department, 1911); vouchers, A. M. Farrington and John R. Mohler.

GEORGIA—Burson, Wm. M., D.V.M., Athens, Ga. (Cincinnati Veterinary College, 1907); vouchers, W. A. Scott and F. W. Jago.

IDAHO—Dickson, John, M.D.C., Boise, Idaho. (Chicago Veterinary College, 1910); vouchers, G. E. Noble and John H. Weber.

ILLINOIS—Alkire, Chas. N., M.D.C., Sidell, Ill. (Chicago Veterinary College, 1911); vouchers, Geo. B. Jones and L. A. Merillat. Andrade, John S., M.D.V., Morton, Ill. (McKillip Veterinary College, 1910); vouchers, M. H. McKillip and Chas. Frazier. Cant, Wm. J., M.D.C., Erie, Ill. (Chicago Veterinary College, 1909); vouchers, L. A. Merillat and A. H. Baker. Giltner, L. T., D.V.M., Chicago, Ill. (New York State Veterinary College, 1906); vouchers, Ward Giltner and Richard P. Lyman. Grutzman, Walter R., D.V.S., Fort Sheridan, Ill. (American Veterinary College, 1896); vouchers, Chester A. McKillip and D. Tencknick. Luzader, Roy A., M.D.C., Morrisonville, Ill. (Chicago Veterinary College, 1910); vouchers, L. A. Merillat and A. H. Baker. Smith, A. W., V.S., Farmer City, Ill. (Ontario Veterinary College, 1888); vouchers, L. A. Merillat and A. H. Baker.

INDIANA—Garside, Peter, M.D.C., Bourbon, Ind. (Chicago Veterinary College, 1910); vouchers, J. W. Klotz and Geo. H. Roberts. Hart, John P., M.D.V., Winchester, Ind. (McKillip

Veterinary College, 1907); vouchers, J. W. Klotz and Geo. H. Roberts. Hidey, John L., V.S., Fortville, Ind. (Indiana Veterinary College, 1903); vouchers, W. B. Craig and Geo. H. Roberts. Langtry, Walter, V.S., Fort Wayne, Ind. (Ontario Veterinary College, 1877); vouchers, J. W. Klotz and Geo. H. Roberts. Marvel, Alexander L., V.S., Owenville, Ind. (Indiana Veterinary College, 1904); vouchers, J. W. Klotz and Geo. H. Roberts. Nelson, Amos F., V.S., M.D.C., Lebanon, Ind. (Indiana Veterinary College, 1901—Chicago Veterinary College, 1902); vouchers, J. W. Klotz and Geo. H. Roberts. Newgent, Ottaway C., D.V.M., Terre Haute, Ind. (Indiana Veterinary College, 1909); vouchers, J. W. Klotz and Geo. H. Roberts. Schwin, Payson E., V.S., Elkhart, Ind. (Ontario Veterinary College, 1888); vouchers, J. W. Klotz and Geo. H. Roberts. Weigel, Marion S., D.V.M., Cromwell, Ind. (Indiana Veterinary College, 1911); vouchers, J. W. Klotz and Geo. H. Roberts. Whitesell, Roy B., D.V.M., Lafayette, Ind. (Indiana Veterinary College, 1910); vouchers, J. W. Klotz and Geo. H. Roberts.

IOWA—Beavers, Glenn R., M.D.V., Arlington, Iowa. (McKillip Veterinary College, 1910); vouchers, J. E. Robertson and J. H. McLeod. Bennis, H. E., D.V.M., Ames, Iowa. (Iowa State College, 1908); vouchers, W. W. Dimock and C. H. Stange. Blanche, George W., D.V.M., Belle Plaine, Iowa (Iowa State College, 1902); vouchers, J. H. McLeod and C. H. Stange. Bradley, Chas. A., M.D.C., Marion, Iowa. (Chicago Veterinary College, 1897); vouchers, J. W. Griffith and Hal C. Simpson. Deming, S. A., M.D.C., Ida Grove, Iowa. (Chicago Veterinary College, 1905); vouchers, C. J. Hinkley and Hal C. Simpson. Hazlet, Samuel K., M.D.C., Oelwein, Iowa. (Chicago Veterinary College, 1895); vouchers, Peter Malcolm and C. H. Stange. Readhead, William, V.S., Lenox, Iowa. (Ontario Veterinary College, 1895); vouchers, A. H. Quinn and S. H. Brennan. Stribling, Wm. E., M.D.C., Earlham, Iowa. (Chicago Veterinary College, 1907); vouchers, Ralph F. Knight and A. Ribard.

KANSAS—Hueben, Frank W., D.V.S., Kansas City, Kan. (Kansas City Veterinary College, 1910); vouchers, R. C. Moore and F. F. Brown. Logan, Edward A., B.S.A., D.V.M., Wamego, Kan. (Kansas State Agricultural College); vouchers, F. S. Schoenleber and K. W. Stouder. McCoy, John E., D.V.M., Cawker City, Kan. (Kansas City Agricultural College, 1909); vouchers, F. S. Schoenleber and K. W. Stouder. Platt, Robert

M., D.V.M., Aetna, Kan. (Kansas State Agricultural College, 1910); vouchers, K. W. Stouder and F. S. Schoenleber.

KENTUCKY—Graham, Robert, D.V.M., Lexington, Ky. (Iowa State College, 1910); vouchers, C. J. Marshall and George H. Glover. Moody, Robert P., D.V.M., Maysville, Ky. (Indiana Veterinary College, 1911); (vouchers omitted from report).

LOUISIANA—Cambon, Frederick J., D.V.S., New Orleans, La. (Kansas City Veterinary College, 1911); vouchers, W. H. Dalrymple and H. G. Patterson. Moore, Hamlet, V.S., New Orleans, La. (Ontario Veterinary College, 1898); voucher, J. Arthur Goodwin (for investigation).

MARYLAND—McCarthy, Henry J., D.V.M., Laurel, Md. (George Washington University, 1911); vouchers, B. T. Woodward and ..... Riley, Edward H., D.V.M., Bethesda, Md. (George Washington University, 1911); vouchers, E. C. Schroeder and John R. Mohler.

MASSACHUSETTS—Babbitt, Frank J., M.D.V., Lynn, Mass. (Harvard Veterinary School, 1897); vouchers, Daniel Emerson and Francis Abele, Jr. Miller, Frederick A., M.D.C., Fitchburg, Mass. (Chicago Veterinary College, 1908); vouchers, W. H. Dodge and H. D. Clark. Pugh, Wm. T., V.S., Southbridge, Mass. (Ontario Veterinary College, 1895); vouchers, Daniel Emerson and Francis Abele, Jr.

MICHIGAN—Armstrong, Walter N., V.S., Concord, Mich. (Ontario Veterinary College, 1894); vouchers, Harry E. States and Richard P. Lyman. Burkholder, Clinton E., D.V.S., Chief, Mich. (Kansas City Veterinary College, 1908); vouchers, J. S. Anderson and P. Juckniess. Carter, George H., V.S., Saginaw, Mich. (Ontario Veterinary College, 1888); voucher, Richard P. Lyman. Dauber, Chas. C., V.S., Sturgis, Mich. (Ontario Veterinary College, 1904); vouchers, Judson Black and Geo. W. Dunphy. Fischer, Herman C., D.V.M., Grand Rapids, Mich. (Grand Rapids Veterinary College, 1911); vouchers, H. L. Schuh and Robertson Muir. Smead, Morgan J., V.S., B.V.Sc., Port Huron, Mich. (University of Toronto, Veterinary Department, 1910); vouchers, S. Brenton and D. Cumming. MacDonald, R. W., V.S., Flint, Mich. (Ontario Veterinary College, 1896); vouchers, G. W. Dunphy and R. P. Lyman. Miller, John M., D.V.M., Grand Rapids, Mich. (Grand Rapids Veterinary College—Ohio State Veterinary College); vouchers, H. L. Schuh and Robertson Muir. Petty, Clarence C., V.S., Lake Odessa,

Mich. (Ontario Veterinary College, 1902); vouchers, George Waddle and Richard P. Lyman. Shevalier, Eugene D., V.S., Escanaba, Mich. (Ontario Veterinary College, 1890); vouchers, Richard P. Lyman and Frank W. Chamberlain.

MINNESOTA—Beach, Burr A., D.V.M., St. Paul, Minn. (Ohio State University, 1909); vouchers, M. H. Reynolds and John Spencer. Corwin, Willis T., D.V.S., Lake City, Minn. (Kansas City Veterinary College, 1911); vouchers, C. S. Shore and L. Hay. Flanary, Wm. F., B.V.Sc., St. Charles, Minn. (Ontario Veterinary College and University of Toronto, 1910); vouchers, J. P. Anderson and L. Hay. Kerner, Rudolph, V.S., Chatfield, Minn. (Ontario Veterinary College, 1896); vouchers, Edward L. Kalb and J. P. Anderson. Legenhausen, Adolph H., M.D.C., Jackson, Minn. (Chicago Veterinary College, 1910); vouchers, L. Hay and F. E. Palmer. Sigmond, Chas. J., V.S., Pipestown, Minn. (Ontario Veterinary College, 1893); vouchers, G. Ed. Leech and George McGilvray.

MISSISSIPPI—Aicher, E. H., D.V.S., Starkville, Miss. (Colorado State College, 1910); vouchers, Tait Butler and James Lewis. Edwards, Ira W., M.D.C., Vicksburg, Miss. (Chicago Veterinary College, 1911); vouchers, Will R. Edwards and James Lewis. Smith, George F., M.D.C., Vicksburg, Miss. (Chicago Veterinary College, 1911); vouchers, Will R. Edwards and James Lewis.

MONTANA—Dufrene, Alfred J., M.D.V., Glendive, Mont. (McKillip Veterinary College, 1910); vouchers, A. H. Cheney and M. E. Knowles.

NEBRASKA—Bacon, Richard M., M.D.C., Tilden, Neb. (Chicago Veterinary College, 1911); voucher, Chas. A. McKim. Boyd, John A., D.V.S., Mason City, Neb. (Kansas City Veterinary College, 1910); vouchers, A. Bostrom and J. S. Anderson. Cady, P. L., D.V.S., Fremont, Neb. (Kansas City Veterinary College, 1910); vouchers, Chas. A. McKim and J. S. Anderson. Cline, Gordon L., D.V.S., Western, Neb. (Kansas City Veterinary College, 1910); vouchers, Chas. A. McKim and L. P. Carstenson. Elliott, Chas. M., D.V.S., Seward, Neb. (Kansas City Veterinary College, 1908); vouchers, J. S. Anderson and S. Stewart. Hyland, Eugene H., D.V.S., Schuyler, Neb. (Kansas City Veterinary College, 1908); vouchers, Chas. A. McKim and L. P. Carstenson. Keehn, Wm. G., D.V.S., Gresham, Neb. (Kansas City Veterinary College, 1911); vouchers, Chas. A. McKim and J. S. Anderson. Meixel, Geo. A., D.V.S., Aurora,

Neb. (Kansas City Veterinary College, 1905); vouchers, Charles A. McKim and L. P. Carstenson. Munn, Albert A., V.S., Kearney, Neb. (Ontario Veterinary College, 1904); vouchers, Chas. A. McKim and John H. Hoylman. Rose, Thomas P., D.V.S., Gresham, Neb. (Kansas City Veterinary College, 1910); vouchers, Chas. A. McKim and L. P. Carstenson. Severin, John R., D.V.S., Wayne, Neb. (Kansas City Veterinary College, 1910); vouchers, Chas. A. McKim and L. P. Carstenson. Wertz, Sydney S., M.D.C., Kenesaw, Neb. (Chicago Veterinary College, 1909); vouchers, Edwin O. Odell and Richard Ebbitt. Norden, Carl J., D.V.S., Nebraska City, Neb. (Kansas City Veterinary College, 1911); vouchers, A. Bostrom and J. S. Anderson.

NEW JERSEY—Belloff, L. J., D.V.S., New Brunswick, N. J. (New York-American Veterinary College, 1902); vouchers, J. Payne Lowe and Wm. Herbert Lowe. Smith, George H., D.V.S., Hoboken, N. J. (New York University, Veterinary Department, 1903); vouchers, J. Payne Lowe and Thomas E. Smith.

NEW MEXICO—Corbin, E. A., M.D.C., Tucumcari, N. M. (Chicago Veterinary College, 1909); vouchers, W. A. Savage and F. H. Barr.

NEW YORK—Cady, Henry, D.V.S., Gloversville, N. Y. (American Veterinary College, 1887); vouchers, J. F. DeVine and W. G. Hollingworth. Comstock, David B., D.V.S., Albany, N. Y. (McGill University, 1891); vouchers, J. F. DeVine and J. G. Wills. Crawford, James E., D.V.S., Far Rockaway, N. Y. (New York-American Veterinary College, 1904); vouchers, R. W. Ellis and J. F. DeVine. Frederick, Harry, D.V.M., Suffern, N. Y. (New York State Veterinary College, 1910); vouchers, W. L. Williams and V. A. Moore. Greer, John, D.V.S., Saranac Lake, N. Y. (McGill University, 1896); vouchers, J. A. McCrank and J. F. DeVine. Kennedy, William W., V.S., Fulton, N. Y. (Ontario Veterinary College, 1890); vouchers, M. M. Poucher and W. L. Williams. Kingston, Richard H., D.V.S., New York City, N. Y. (New York-American Veterinary College, 1904); vouchers, R. W. Ellis and W. J. Coates. McCartney, John, D.V.M., Brooklyn, N. Y. (New York State Veterinary College, 1909); vouchers, E. B. Ackerman and George H. Berns. Moorhouse, Wm. B., D.V.S., Tarrytown, N. Y. (American Veterinary College, 1894); vouchers, W. J. Coates and R. W. Ellis. Nichols, Percival K., D.V.S., Port Richmond, N. Y. (American Veterinary College, 1896); vouch-

ers, E. B. Ackerman and John L. Halloran. Pearce, Chas. D., D.V.M., Owego, N. Y. (New York State Veterinary College, 1908); vouchers, J. F. DeVine and W. L. Williams. Rafter, Edward, V.S., Hamburg, N. Y. (Ontario Veterinary College, 1895); vouchers, Frank Hunt and W. S. Baker; Roig, Chester A., D.V.M., Poughkeepsie, N. Y. (New York State Veterinary College, 1910); vouchers, Otto Faust and Edward J. Nesbitt. Schlesinger, Alex., Jr., D.V.M., Whitney Point, N. Y. (New York State Veterinary College, 1910); vouchers, J. Payne Lowe and P. A. Fish. Sheldon, Thomas, D.V.M., Rhinebeck, N. Y. (New York State Veterinary College, 1907); vouchers, J. F. DeVine and J. G. Wills. Smith, William B., D.V.M., Arcade, N. Y. (New York State Veterinary College, 1906); vouchers, J. F. DeVine and J. G. Wills. Stone, Garry T., D.V.M., Norwich, N. Y. (New York State Veterinary College, 1900); vouchers, J. F. DeVine and W. L. Williams. Taylor, Chas. H., D.V.M., Niagara Falls, N. Y. (New York State Veterinary College, 1905); vouchers, V. A. Moore and W. L. Williams. Towner, Albert N., D.V.S., Brewster, N. Y. (New York-American Veterinary College, 1908); vouchers, F. W. Andrews and Robert W. Ellis.

NORTH CAROLINA—Chrisman, Wm. G., V.S., Raleigh, N. C. (Ontario Veterinary College, 1902); vouchers, N. S. Mayo and Geo. C. Faville.

NORTH DAKOTA—Anderson, F. J., V.S., Grand Forks, N. D. (Ontario Veterinary College, 1905); vouchers, W. F. Crewe and L. Van Es. Anderson, Herbert, V.S., Dickinson, N. D. (Ontario Veterinary College, 1906); vouchers, W. F. Crewe and L. Van Es. Chisholm, Jos. P., V.S., Lisbon, N. D. (Ontario Veterinary College, 1904); vouchers, W. F. Crewe and L. Van Es. Graff, Carl P. L., Dr., Rolla, N. D. (Royal Veterinary College, Copenhagen, Denmark, 1904); vouchers, W. F. Crewe and S. P. Smith. Harris, E. D., D.V.M. (State University, Veterinary Department, 1907) (name of state and vouchers not given in report). Jones, Albert C., D.V.S., High Point, N. C. (Kansas City Veterinary College, 1909); vouchers G. C. Roberts, Geo. H. Glover and C. J. Marshall. Krieger, Robt. E., M.D.C., Ray, N. D. (Chicago Veterinary College, 1906); vouchers, W. F. Crewe and E. J. Walsh. McDonnell, L. E., M.D.C., Hankinson, N. D. (Chicago Veterinary College, 1908); vouchers, W. F. Crewe and L. Van Es. McLain, John H., M.D.C., Inkster, N. D.

(Chicago Veterinary College, 1894); vouchers, W. F. Crewe and L. Van Es. Norton, Robert S., M.D.C., Velva, N. D. (Chicago Veterinary College, 1910); vouchers, W. F. Crewe and E. J. Walsh. Patton, Don W., D.V.M., Steele, N. D. (Veterinary Department, Iowa State College, 1893); vouchers, W. F. Crewe and L. Van Es. Schalk, Arthur F., D.V.M., Agricultural College, N. D. (Ohio State University, 1908); vouchers, L. Van Es and W. F. Crewe. Schneider, Ernest, M.D.C., Kulm, N. D. (Chicago Veterinary College, 1909); vouchers, W. F. Crewe and L. Van Es. Shigley, Ralph E., M.D.C., Kenmare, N. D. (Chicago Veterinary College, 1909); vouchers, W. F. Crewe and E. J. Walsh. Sims, Thomas, V.S., Bottineau, N. D. (Ontario Veterinary College, 1898); vouchers, W. F. Crewe and E. J. Walsh. Thompson, John B., M.D.C., Kenmare, N. D. (Chicago Veterinary College, 1910); vouchers, W. F. Crewe and E. J. Walsh. Van De Ewe, Jacob, M.D.C., Sherwood, N. D. (Chicago Veterinary College, 1910); vouchers, E. J. Walsh and W. F. Crewe. Westgate, Samuel S., V.S., M.D.V., Mott, N. D. (Ontario Veterinary College, 1906—McKillip Veterinary College, 1907); vouchers, W. F. Crewe and L. Van Es. Winsloe, J. A. H., V.S., Cooperstown, N. D. (Ontario Veterinary College, 1897); vouchers, W. F. Crewe and L. Van Es.

OHIO—Biddle, Glen, V.S., B.V.Sc., Wauseon, Ohio (Ontario Veterinary College and University of Toronto, 1910); vouchers, A. J. Kline and C. S. Bucher. Clark, Rees, D.V.M., Winchester, Ohio (Cincinnati Veterinary College, 1910); vouchers, F. R. Smythe and Louis P. Cook. Gemmill, A. D., V.S., Celina, Ohio (Ontario Veterinary College, 1892); vouchers, J. H. Blattenburg and Louis P. Cook. Hershey, Chas. E., V.S., Tiffin, Ohio (Ontario Veterinary College, 1906); vouchers, W. B. Washburn and John V. Newton. Hill, Robert C., V.S., West Alexandria, Ohio (Ontario Veterinary College, 1895); vouchers, Walter Shaw and Edgar H. Shepard. Jefferson, Jos. H., V.S., Chicago Jct., Ohio (Ontario Veterinary College, 1906); vouchers, H. Fulstow and W. B. Washburn. Severcool, Lucius A., V.S., Elyria, Ohio (Ontario Veterinary College, 1880); vouchers, E. H. Shepard and J. L. Farahger. Sisson, Septimus, S.B., V.S., Columbus, Ohio (Ontario Veterinary College, 1891); vouchers, J. H. McNeil and Arthur S. Cooley.

OREGON—Cavney, Stephen J., D.V.S., Portland, Ore. (San Francisco Veterinary College, 1902); vouchers, Charles Keane

and P. H. Browning. Johnson, Albert C., D.V.S., Portland, Ore. (San Francisco Veterinary College, 1909); vouchers, Henry Munn and W. Dean Wright. Mitchell, George C., M.D.C., Klamath Falls, Ore. (Chicago Veterinary College, 1909); vouchers, W. Dean Wright and Wm. Lytle. Wright, Chas. C., M.D.C., Lebanon, Ore. (Chicago Veterinary College, 1910); vouchers, W. Dean Wright and J. F. Morel.

PENNSYLVANIA—Borneman, Harris S., V.S., Norristown, Pa. (Ontario Veterinary College, 1882); vouchers, H. Preston Hoskins and C. J. Marshall; Bruner, S. E., V.M.D., Greensburg, Pa. (Veterinary Department, University of Pennsylvania, 1906); vouchers, H. Preston Hoskins and C. J. Marshall. Cahill, Edward A., V.M.D., Canonsburg, Pa. (University of Pennsylvania, Veterinary Department, 1909); vouchers, C. J. Marshall and H. Preston Hoskins. Cecil, Joseph D., V.M.D., Philadelphia, Pa. (University of Pennsylvania, Veterinary Department, 1910); vouchers, C. J. Marshall and H. Preston Hoskins. Cole, Alonzo B., B.V.Sc., Montrose, Pa. (Ontario Veterinary College, 1910); vouchers, C. J. Marshall and H. Preston Hoskins. Fetherolf, G. R., V.S., Reading, Pa. (Ontario Veterinary College, 1894); vouchers, J. W. Sallade and Otto G. Noack. Gimper, Wm. S., V.M.D., Philadelphia, Pa. (University of Pennsylvania, Veterinary Department, 1910); vouchers, W. J. Lentz and C. J. Marshall. Haines, W. Albertson, V.M.D., Bristol, Pa. (University of Pennsylvania, Veterinary Department, 1907); vouchers, H. Preston Hoskins and C. J. Marshall. Kann, R. L., V.S., M.D.V., Mechanicsburg, Pa. (Ontario Veterinary College, 1895; McKillip Veterinary College, 1901); vouchers, C. J. Marshall and H. Preston Hoskins. Keelor, Allen Z., V.S., Telford, Pa. (Ontario Veterinary College, 1891); vouchers, C. J. Marshall and H. Preston Hoskins. Keelor, J. Rein, V.S., Harleysville, Pa. (Ontario Veterinary College, 1883); vouchers, S. E. Weber and C. J. Marshall. Kuhn, J. M., V.S., Mercersburg, Pa. (Ontario Veterinary College, 1889); vouchers, C. J. Marshall and H. Preston Hoskins. McAnulty, John F., V.M.D., Philadelphia, Pa. (Veterinary Department, University of Pennsylvania, 1898); vouchers, C. J. Marshall and H. Preston Hoskins. McCarthy, F. H., V.S., Pottsville, Pa. (Ontario Veterinary College, 1892); vouchers, J. W. Sallade and I. C. Newhard. McCloskey, James A., V.M.D., Philadelphia, Pa. (Veterinary Department, University of Pennsylvania, 1908); vouchers, W. J. Lentz and C. J. Mar-

shall. McDonough, John F., V.M.D., Philadelphia, Pa. (Veterinary Department, University of Pennsylvania, 1910); vouchers, W. L. Rhoads and H. Preston Hoskins. Marshall, Leslie G., V.M.D., Towanda, Pa. (Veterinary Department, University of Pennsylvania, 1904); vouchers, Ernest C. Dingley and W. J. Lentz. Mattson, Wm. H., V.M.D., Chester Heights, Pa. (Veterinary Department, University of Pennsylvania, 1889); vouchers, H. Preston Hoskins and C. J. Marshall. Meyer, Karl F., V.M.D., Philadelphia, Pa. (Berne, Munich, Zurich, Vienna, 1908); vouchers, C. J. Marshall and H. Preston Hoskins. Mitchell, Adrian J., Sr., V.S., Erie, Pa. (Ontario Veterinary College, 1885); vouchers, C. J. Marshall and H. Preston Hoskins. Mock, William, V.S., Easton, Pa. (Ontario Veterinary College, 1892); vouchers, C. J. Marshall and H. Preston Hoskins. Moyer, Calvin W., V.M.D., Sunbury, Pa. (Veterinary Department, University of Pennsylvania, 1911); vouchers, Louis A. Klein and H. Preston Hoskins. Moyer, Vincent C., V.M.D., Philadelphia, Pa. (Veterinary Department, University of Pennsylvania); vouchers, C. J. Marshall and W. J. Lentz. Nice, Frank K., D.V.S., Philadelphia, Pa. (American Veterinary College, 1892); vouchers, Harry B. Cox and W. Horace Hoskins. Paxson, Wm. Henry, V.M.D., Marietta, Pa. (Veterinary Department, University of Pennsylvania, 1905); vouchers, S. H. Gilliland and E. L. Cornman. Rentschler, Mandon D., M.D.V., Punxsutawney, Pa. (McKillip Veterinary College, 1909); vouchers, C. J. Marshall and H. Preston Hoskins. Staley, Raymon M., V.M.D., New Cumberland, Pa. (Veterinary Department, University of Pennsylvania, 1906); vouchers, S. H. Gilliland and C. J. Marshall. Witmer, Hervey W., V.S., Shippensburg, Pa. (Ontario Veterinary College, 1895); vouchers, C. J. Marshall and H. Preston Hoskins.

RHODE ISLAND—Smith, Herbert M., M.D.V., Providence, R. I. (Harvard Veterinary School, 1886); vouchers, John S. Pollard and T. E. Robinson.

SOUTH DAKOTA—Embree, Warren J., M.D.C., Aberdeen, S. D. (Chicago Veterinary College, 1910); vouchers, S. W. Allen and C. McDowell. McCain, Earl A., M.D.V., Gregory, S. D. (McKillip Veterinary College, 1911); vouchers, J. T. McGilvray and S. W. Allen. Venzke, Harry E., M.D.V., Pierre, S. D. (McKillip Veterinary College, 1911); vouchers, S. E. Cosford and S. W. Allen.

TEXAS—Foster, Allen A., D.V.S., Marshall, Tex. (Kansas City Veterinary College, 1910); vouchers, Chas. D. Folse and W. A. Knight.

UTAH—Egbert, Arch., D.V.M., Logan, Utah. (Ohio State University, 1911); vouchers, H. J. Frederick and John Ernst. Halton, John H., D.V.S., Salt Lake City, Utah (San Francisco Veterinary College, 1903); vouchers, A. D. Melvin and R. P. Lyman. Nebeker, Shirley, D.V.S., Lake Town, Utah (Kansas City Veterinary College, 1911); vouchers, H. J. Frederick and John Ernst.

VERMONT—Farmer, Albion O., D.V.M., Island Pond, Vt. (Ohio State College, 1911); voucher, J. H. McNeil.

VIRGINIA—Neff, S. C., V.S., Staunton, Va. (Ontario Veterinary College, 1901); vouchers, R. R. Clarke and H. Bannister. Will, Evan J., V.S., Harrisonburg, Va. (Ontario Veterinary College, 1896); vouchers, R. R. Clarke and H. Bannister.

WEST VIRGINIA—Langdon, Harry B., V.S., Charlestown, W. Va. (Ontario Veterinary College, 1911); vouchers, G. W. Dunphy and S. Brenton.

WISCONSIN—Benson, Eugene R., M.D.C., Superior, Wis. (Chicago Veterinary College, 1910); vouchers, S. E. Burnham and J. G. Harris. Bryant, Albert E., V.S., Menomonie, Wis. (Ontario Veterinary College, 1893); vouchers, W. G. Clark and D. B. Clark. Clarke, Burnett L., M.D.C., Monticello, Wis. (Chicago Veterinary College, 1895); vouchers, R. S. Heer and W. G. Clark. Evans, Christman E., D.V.S., Racine, Wis. (American Veterinary College, 1883); vouchers, W. G. Clark and F. W. B. Achen. Fabian, Arthur E. H., M.D.C., Lake Geneva, Wis. (Chicago Veterinary College, 1908); vouchers, F. W. B. Achen and W. G. Clark. Finkle, Ray C., M.D.C., Seymour, Wis. (Chicago Veterinary College, 1910); vouchers, J. P. West and W. A. Wolcott. Kickbusch, Frank A., M.D.V., Marinette, Wis. (McKillip Veterinary College, 1904); vouchers, W. G. Clark and S. J. Walkley. Kinyon, B. F., D.V.S., Ladysmith, Wis. (Chicago Veterinary College, 1891); vouchers, W. G. Clark and F. G. Neilson. Madson, William, M.D.C., Peshtigo, Wis. (Chicago Veterinary College, 1911); vouchers, W. G. Clark and J. P. West. Wrigglesworth, Thomas, V.S., Eau Claire, Wis. (Ontario Veterinary College, 1882); vouchers, W. G. Clark and D. B. Clark.

ALBERTA, CANADA—Caldwell, Jos. H., V.S., Edmonton, Alta., Canada (Ontario Veterinary College, 1907—McKillip

Veterinary College, 1908); vouchers, J. C. Hargrave and A. M. McKay. Watson, Edward A., V.S., Lithbridge, Alta., Canada (Ontario Veterinary College, 1904); vouchers, J. C. Hargrave and D. Warnock.

MANITOBA, CANADA—Bescoby, Bernard A., B.V.Sc., Winnipeg, Man., Canada (Ontario Veterinary College, 1910); vouchers, C. D. McGilvray and F. Torrance. Coxe, S. S., V.S., Brandon, Man., Canada (Ontario Veterinary College, 1894); vouchers, F. Torrance and W. Hilton. Hilliard, Wm. A., D.V.Sc., Winnipeg, Man., Canada (McGill University, 1897); vouchers, W. Hilton and F. Torrance. Irwin, Ivan B., V.S., Stonewall, Man., Canada (Ontario Veterinary College, 1911); vouchers, F. Torrance and C. D. McGilvray. Pomfret, Henry, M. D. V., Winnipeg, Man., Canada (Ontario Veterinary College, 1904); vouchers, F. Torrance and C. D. McGilvray. Richards, Thomas H., V.S., Winnipeg, Man., Canada (Ontario Veterinary College, 1901); vouchers, C. D. McGilvray and F. Torrance. Ross, James D., V.S., Winnipeg, Man., Canada (Ontario Veterinary College, 1894); vouchers, C. D. McGilvray and F. Torrance. Stiver, M. B., D.V.Sc., Elgin, Man., Canada (Ontario Veterinary College, 1895); vouchers, F. Torrance and W. Hilton. Welch, John, V.S., Roland, Man., Canada (Ontario Veterinary College, 1895); vouchers, F. Torrance and C. D. McGilvray.

NOVA SCOTIA—Jakeman, Harry W., V.M.D., Halifax, N. S., Canada (Veterinary Department, University of Pennsylvania, 1909); vouchers, Wm. Jakeman and C. J. Marshall. McLean, Adam Thomas, V.S., B.V.Sc., Truro, N. S., Canada (Ontario Veterinary College, University of Toronto, 1910); voucher, E. A. A. Grange.

ONTARIO—Barnes, Robert, V.S., Ottawa, Canada (Ontario Veterinary College, 1893); vouchers, J. G. Rutherford and A. E. Moore. Fowler, W. J. R., V.S., B.V.Sc., Toronto, Canada (Ontario Veterinary College, 1899); vouchers (omitted in report). Hilton, George, V.S., Ottawa, Canada (Ontario Veterinary College, 1897); vouchers, J. G. Rutherford and A. E. Moore. Rice, John M., V.S., Lindsay, Ont., Canada (Ontario Veterinary College, 1906); vouchers (omitted in report).

QUEBEC—Laroche, Omer, D.V.S., Montreal, P. Q., Canada (Ecole Veterinaire Francais Laval, 1905); vouchers, M. C. Baker and A. Etienne. Vigneau, Jos. H., D.V.S., Three Rivers.

P. Q., Canada (Laval University, 1897); vouchers, A. A. Etienne and M. C. Baker.

SASKATCHEWAN—Aikenhead, J. P., V.S., B.V.Sc., Humboldt, Sask. (Ontario Veterinary College, 1911); vouchers, D. Tamblyn and John F. Burnett. Armstrong, Jas. A., V.S., Regina, Sask., Canada (Ontario Veterinary College, 1888); vouchers, J. F. Burnett and D. Tamblyn. Dixon, Hugh L., B.V.Sc., Regina, Sask., Canada (Ontario Veterinary College, 1910); vouchers, J. F. Burnett and D. Tamblyn. DuFresne, J. B. A. A., D.V.S., Regina, Sask., Canada (Laval University, 1909); vouchers, J. F. Burnett and D. Tamblyn. Head, Charles, V.S., M.D.C., Regina, Sask., Canada (Ontario Veterinary College, 1906—Chicago Veterinary College, 1907); vouchers, J. F. Burnett and D. Tamblyn. Lockhart, Andrew A., V.S., M.D.V., Carnduff, Sask., Canada (Ontario Veterinary College, 1904—McKillip Veterinary College, 1905); vouchers, J. F. Burnett and D. Tamblyn. Murison, James J., V.S., Arcola, Sask., Canada (Ontario Veterinary College, 1901); vouchers, J. F. Burnett and D. Tamblyn.

#### HONOR ROLL.

The name of S. E. Weber, Lancaster, Pa., was added to the honor roll.

#### CABLEGRAMS.

“ Paris, August 22, 1911.

“ President, Veterinary Association,

“ Convocation Hall, Toronto:

“ Again present at roll-call to offer friendly greetings and best wishes.

“ LIAUTARD.”

President Glover appointed two members to send an acknowledgment of receipt of cablegram to Prof. Liautard.

#### SECRETARY'S REPORT.

As Secretary Marshall's report will appear in detail in the published proceedings of the association, we will not use the much-needed space to reproduce it here; but desire to compliment Dr. Marshall on its completeness, and the clear and comprehensive form in which it was presented.

## REPORT OF TREASURER.

## RECEIPTS FOR 1910-II.

1910.

|   |            |
|---|------------|
| September 10—Balance in bank as per last annual report..... | \$2,332 47 |
| December 5—Received from C. J. Marshall, Secretary.....     | 1,750 00   |

1911.

|  |          |
|--|----------|
| May 20—Received from C. J. Marshall, Secretary.....    | 775 00   |
| July 25—Received from C. J. Marshall, Secretary.....   | 800 00   |
| August 14—Received from C. J. Marshall, Secretary..... | 2,000 00 |

|                              |            |
|------------------------------|------------|
| Total receipts, 1910-II..... | \$7,657 47 |
|------------------------------|------------|

## DISBURSEMENTS FOR 1910-II.

1910.

|   |         |
|---|---------|
| September 9—To L. A. Merillat, Chicago, Ill., expenses as Resident Secretary, 1909-10.....  | \$15 85 |
| September 9—To Chas. F. Roberts, New Haven, Conn., for traveling expenses to San Francisco meeting.....                                   | 100 00  |
| September 9—To Orah M. Nichols, San Francisco, Cal., for typewriting report of Committee on Resolutions.....                              | 1 50    |
| September 9—To Chas. F. Roberts, New Haven, Conn., for services in case of Jos. Hubinger vs. American Veterinary Medical Association..... | 25 00   |
| September 9—To R. P. Lyman, Hartford, Conn., for salary to date   | 500 00  |
| October 20—To Joseph Plaskett, Nashville, Tenn., for expenses as Resident Secretary to September 5, 1910.....                             | 1 00    |
| October 20—To Geo. R. White, Nashville, Tenn., for expenses as Treasurer, 1909-10.....  | 5 00    |
| October 20—To Orah M. Nichols, San Francisco, Cal., for stenographic work, by C. J. Marshall.....   | 3 00    |
| October 20—To Richard F. Bourne, Kansas City, Mo., for expenses as Resident Secretary for 1909-10.....                                    | 5 00    |
| October 20—To J. P. Turner, Washington, D. C., for stamps and typewriting report of Committee on Legislation.....                         | 4 75    |
| October 20—To Richard F. Eagle, Fort Worth, Texas, for expenses as Resident Secretary, 1909-10.....                                       | 6 25    |
| October 20—To R. P. Lyman, East Lansing, Mich., for expenses to and from 47th Annual Meeting and incidental expenses to date.....         | 240 86  |
| October 20—To J. W. Klotz, Noblesville, Ind., for expenses as Resident Secretary, 1909-10.....  | 7 00    |
| October 20—To S. F. Tolmie, Victoria, B. C., for expenses as Resident Secretary, 1909-10.....   | 3 85    |
| October 20—To Standard Printing Co., Nashville, Tenn., for printing 600 copies Treasurer's report.....                                    | 15 00   |
| October 20—To W. Dean Wright, Portland, Oregon, for expenses as Resident Secretary, 1909-10.....  | 2 20    |
| October 20—To Bryant & Douglass, Book & Stationery Co., Kansas City, Mo., for supplies by R. P. Lyman.....                                | 55      |
| October 20—To Mrs. R. R. Carmack, Nashville, Tenn., for typewriting Treasurer's report.....   | 1 75    |
| November 5—To Johnson & Prince, Philadelphia, Pa., for duplicating 200 letters.....   | 1 50    |

|  |        |
|--|--------|
| November 5—To W. L. Williams, Ithaca, N. Y., for expenses as Librarian from October 24, 1908, to September 6, 1910.....                          | 16 39  |
| November 5—To Joseph Hughes, Chicago, Ill., for membership fees and dues paid for Dr. Frederick Foster.....                                      | 8 00   |
| November 5—To John W. Spence, Philadelphia, Pa., for printing letter heads, envelopes, bill heads, etc., by Secretary Marshall                   | 20 50  |
| November 21—To E. A. A. Grange, Toronto, Canada, for duty on membership forms.....   | 1 75   |
| November 21—To American Surety Co., New York, N. Y., for premium on Treasurer's bond.....  | 10 00  |
| November 21—To Edward P. Dolbey & Co., Philadelphia, Pa., for ledger, letter files, cards, index, trays, etc., by C. J. Marshall, Secretary..... | 8 63   |
| November 27—To H. L. Hungerford, Manila, P. I., for fees and dues returned.....  | 8 00   |
| November 27—To William J. Guilfoil, Kansas City, Kan., for fees and dues returned.....   | 8 00   |
| November 27—To E. P. Wood, Raleigh, N. C., for fees and dues returned.....   | 8 00   |
| November 27—To M. C. Delano, Sacramento, Cal., for fees and dues returned.....   | 8 00   |
| December 15—To C. J. Marshall, Philadelphia, Pa., for stationery, postal cards, stamps, expressage, etc.....                                     | 35 40  |
| December 15—To J. Arthur Goodwin, New Iberia, La., for expenses as Resident Secretary to September 6, 1910.....                                  | 1 50   |
| December 20—To R. P. Lyman, East Lansing, Mich., for stenographic services paid to C. M. Budd.....   | 25 03  |
| December 20—To Marion L. Pattison, Oxnard, Cal., for fees and dues returned.....   | 8 00   |
| December 27—To C. J. Marshall, Philadelphia, Pa., for expressage, postage, freight, etc.....   | 22 50  |
| December 27—To Chas. F. Roberts, New Haven, Conn., for expenses to San Francisco and reporting 47th Annual Meeting                               | 283 85 |
| 1911.  |        |
| January 6—To Lewis E. Tuttle, San Francisco, Cal., for fees and dues returned.....   | 8 00   |
| January 15—To Edward P. Dolbey & Co., Philadelphia, Pa., for seals and index cards by Secretary Marshall.....                                    | 3 10   |
| January 15—To John R. Mohler, Washington, D. C., for stamps in mailing manuscript of Tuberculosis Commission.....                                | 3 52   |
| January 15—To William H. Hoskins Co., Philadelphia, Pa., for one Journal.....  | 85     |
| January 15—To Johnson & Prince, Philadelphia, Pa., for duplicating letters.....  | 2 50   |
| January 15—To John W. Spence, Philadelphia, Pa., for printing, letter heads, envelopes and postal cards.....                                     | 64 10  |
| January 21—To John P. Turner, Washington, D. C., for use of Committee on Legislation.....  | 300 00 |
| February 12—To Emele Pouppirt, Tulare, Cal., for fees and dues returned.....   | 8 00   |
| February 12—To C. J. Marshall, Philadelphia, Pa., for expressage and stamps.....   | 31 05  |
| February 12—To A. E. Donovan, Fort Riley, Kans., for fees and dues returned.....   | 8 00   |
| February 12—To W. Horace Hoskins, Philadelphia, Pa., for floral wreath (Dr. C. T. Goentner).....   | 10 00  |

|  |            |
|--|------------|
| February 12—To Johnson & Prince, Philadelphia, Pa., for duplicating 1,300 letters by C. J. Marshall, Secretary.....                | 4 60       |
| February 12—To Edward P. Dolbey & Co., Philadelphia, Pa., for letter files, twine and day book, by C. J. Marshall, Secretary ..... | 1 75       |
| February 22—To Mrs. H. B. Cox, Philadelphia, Pa., for floral wreath (Dr. S. J. J. Harger).....                                     | 10 00      |
| February 28—To D. McCuaig, McAdams Junction, N. B., for expressage and customs duty on stationery.....                             | 1 65       |
| March 23—To S. H. Gilliland, Marietta, Pa., for stamps, stationery, telegrams, etc.....  | 25 73      |
| March 23—To T. L. Dardis, Stockton, Cal., for fees and dues returned .....   | 8 00       |
| May 1—To Edward P. Dolbey & Co., Philadelphia, Pa., for mailing tubes, glue, rubber bands, etc.....                                | 5 40       |
| May 1—To Richard P. Lyman, East Lansing, Mich., for expressage, postage, typewriting, etc.....                                     | 9 19       |
| May 8—To C. J. Marshall, Philadelphia, Pa., for expressage, stamps, etc.....   | 21 30      |
| May 8—To Samuel D. Holt, Philadelphia, Pa., for engrossing certificates and resolutions.....                                       | 112 70     |
| May 8—To J. B. Lippincott Co., Philadelphia, Pa., for application blanks, Constitution and By-Laws.....                            | 52 25      |
| May 8—To United States Express Co., East Lansing, Mich., for expressing 539 copies proceedings San Francisco meeting..             | 122 50     |
| May 8—To Robert Smith Printing Company, Lansing, Mich., for printing 1,400 copies proceedings San Francisco meeting....            | 1,278 19   |
| July 8—To American Express Co., Lansing, Mich., for expressing 502 copies proceedings 1910 meeting.....                            | 115 46     |
| July 16—To J. B. Lippincott Co., Philadelphia, Pa., for printing application blanks, by Secretary Marshall.....                    | 11 50      |
| August 6—To W. G. Clark, Marinette, Wis., for expenses as Resident Secretary.....  | 7 75       |
| August 6—To I. E. Nesom, Fort Collins, Colo., for expenses as Resident Secretary.....  | 2 00       |
| August 6—To John W. Spence, Philadelphia, Pa., for printing stationery, etc., by C. J. Marshall, Secretary.....                    | 184 41     |
| August 6—To Edward P. Dolbey, Philadelphia, Pa., for ½ doz. Dane letter files.....   | 1 80       |
| August 6—To C. J. Marshall, Philadelphia, Pa., for telegrams, postage stamps, expressage, etc.....                                 | 63 15      |
| August 6—To C. J. Marshall, Philadelphia, Pa., for salary for 1910-11 .....  | 500 00     |
| Total expenditures, 1910-11.....   | \$4,392 06 |

DISBURSEMENTS BY THE INTERNATIONAL TUBERCULOSIS COMMISSION.  
1910.

|   |         |
|---|---------|
| October 20—To M. H. Reynolds, St. Paul, Minn., for typewriting and extra copies Tuberculosis Commission report..... | \$11 80 |
| 1911.   |         |
| February 12—To M. H. Reynolds, St. Paul, Minn., for stamps and expressage for Tuberculosis Commission.....          | 15 91   |
| February 28—To M. H. Reynolds, St. Paul, Minn., for letter heads (Tuberculosis Commission).....                     | 7 25    |

|   |            |          |
|---|------------|----------|
| March 2—To M. H. Reynolds, St. Paul, Minn., for 6 indexes for Tuberculosis Commission.....  |            | 1 80     |
| March 10—To M. H. Reynolds, St. Paul, Minn., for express paid on 2,000 copies report International Tuberculosis Commission .....    |            | 8 55     |
| May 1—To M. H. Reynolds, St. Paul, Minn., for stenographic work for Tuberculosis Commission.....                                    |            | 18 00    |
| May 1—To M. H. Reynolds, St. Paul, Minn., for postage stamps for Tuberculosis Commission.....                                       |            | 10 00    |
| May 20—To M. H. Reynolds, Secretary, St. Paul, Minn., for 30,000 copies report Tuberculosis Commission, printed and delivered ..... |            | 580 43   |
| May 25—To M. H. Reynolds, St. Paul, Minn., for freight and storage charges on Tuberculosis Commission reports.....                  |            | 13 22    |
| July 8—To M. H. Reynolds, St. Paul, Minn., for multigraphing letters for Tuberculosis Commission.....                               |            | 3 30     |
| July 8—To M. H. Reynolds, St. Paul, Minn., for stamps.....  |            | 10 00    |
| Total expenditures.....   |            | \$680 26 |
| Grand total disbursements.....  | \$5,072 32 |          |
| Balance in bank.....  | 2,585 15   |          |

Respectfully submitted,

GEORGE R. WHITE, Treasurer.

Toronto, Canada, August 22, 1911.

*To the Finance Committee of the American Veterinary Medical Association:*

GENTLEMEN—This certifies that George R. White, Treasurer, has on deposit with the State Trust Company, to the credit of the American Veterinary Medical Association, two thousand five hundred eighty-five and fifteen hundredths dollars (\$2,585.15).

J. C. ADAMSON, Cashier.

Nashville, Tenn., August 18, 1911.

REPORTS OF COMMITTEES.

REPORT OF COMMITTEE ON DISEASES.

According to the constitution and by-laws of this association it is the duty of the Committee on Diseases to report on the character and extent of prevalent contagious diseases throughout America and report on the same at each meeting of the association.

It appears to the chairman of this committee that many phases of our work should have reports calling attention to those things which have been brought to light and practice during the year.

It appears to me that in the place of the committee on diseases there should be four committees as follows:

A committee on infectious diseases which should report prevailing infectious diseases as to prevalence, etc., and should include any items of interest in bacteriology and pathology.

A committee on therapeutics and practice which should bring out newer ideas in therapeutics and practice.

A committee on surgery and clinics which should report on any new surgical phases.

A committee on veterinary sanitary measures which should report on laws and rulings controlling infectious diseases and on the subjects of meat and dairy inspection.

These committees could act as section committees on program.

In accordance to duties of this committee as defined in the by-laws, your chairman has made an effort to collect such information from the United States and Canada as would enable him to make a comprehensive report of existing contagious diseases.

**ACTINOMYCOSIS.**—This disease prevails especially in the Middle West. The economic importance of the disease has caused most owners to have their animals operated on and treated in the earlier stages, so that the large numbers in advanced stages that accumulated in the government rejected pens at the stockyards at the large packing centres a few years ago are gradually becoming less. It has been found at one of the large packing houses in one of our large cities that approximately 1 per cent. of the beef tongues will be found to contain small actinomycotic areas if each tongue be carefully palpated.

**ANTHRAX.**—Anthrax has continued to make its appearance in some of the Western and Southern States, especially Nevada, Texas, also in Delaware, and some of the Gulf States, also Northeast, especially Vermont as well as Canada.

A serious outbreak occurred in Eastern Texas (Beaumont District) during the past year. Prompt action by the state authorities in quarantine and vaccination soon brought the disease under control. Outbreaks have also been reported in South Dakota and Iowa, also reported from New York.

Dr. W. H. Dalrymple, under division 5 of the general program of this meeting, will make more extensive report of this disease in the South.

AVIAN DIPHTHERIA is prevalent throughout the country and causes hundreds of thousands of dollars loss annually to the poultry industry.

A special paper prepared by Drs. C. M. Haring and C. A. Kofoid, of California, will be read under division 4 of this meeting.

AMPHISTOMIASIS has been found in some cattle raised near Omaha, Nebraska. The amphistoma conicum were found in the rumen. Very few reports have ever been made of this parasite from the United States.

BURSATTI has again made its appearance throughout the greater part of the country.

CANINE DISTEMPER continues to be prevalent among young dogs in the entire country.

An article appeared in a recent issue of the *Journal of Infectious Diseases* which shows the painstaking experiments conducted by Dr. N. S. Ferry, in which he has probably proved beyond doubt the causative germ of this malady.

This organism is a short, slender bacillus which he proposes to call *Bacillus bronchicanis*. It has been isolated from the nasal discharge, larynx, trachea, lungs, blood and other organs. It is gram negative, motile, and grows slowly. It does not produce indol. It does not coagulate milk and no acid is formed. It does not produce gas and is aerobic. Inoculations of this organism subcutaneously or intravenously does not produce typical symptoms, but inoculated intratracheally or poured in nostrils typical symptoms develop. It was found that staphylococcus and streptococcus are often secondary invaders, and staphylococci are frequently found in the blood, indicating the possibility of a terminal staphylococcic septicæmia. The typical symptoms of canine distemper noted are cough, diarrhœa, vomiting, purulent discharge from the eyes and nose, skin eruptions, nervous manifestations as convulsive muscular twitching or choreaform movements. The *Bacillus bronchicanis* will be agglutinated by serum from a dog with distemper in dilutions 1 to 800. The mucopurulent discharge Ferry considers as due to the secondary invaders, and claims to have found the causative organism in the lung and trachea three weeks after the animal has made an apparent recovery. If the dog be given an anti-

septic bath and placed in clean, disinfected quarters the secondary invading organisms which produce the prominent symptoms are less active and recovery takes place earlier.

J. P. McGowan of England has recently confirmed Ferry's results.

CEREBRO-SPINAL MENINGITIS among horses has been reported in various parts of the country, especially in some of the Atlantic States. In some of these reports under the above heading the cause was attributed to moldy corn, in others to moldy silage. One outbreak occurred in Colorado. The cause was not determined. Another outbreak was reported from Iowa.

CHICKEN CHOLERA is widely distributed and causes much financial loss.

COCCIDIOSIS is found in cattle, rabbits and in birds. The greatest loss is, perhaps, in young chicks. The coccidium tenellum causes one form of white diarrhoea and has been reported from the Eastern as well as the Western States.

COLIC, gastric and intestinal, while not contagious, yet on account of its importance the committee wishes to call attention to it. This disease alone perhaps causes more loss annually the country over than any one of the contagious diseases. Among the principal causes are those of over-feeding on corn chop, barley, etc. Alfalfa impaction, which most often occurs in the floating colon, gives considerable trouble in sections of the country where alfalfa constitutes the roughage.

CONJUNCTIVITIS CONTAGIOSUS OF CATTLE AND SHEEP—An occasional herd of cattle is reported with this malady. Two bands of sheep similarly affected are reported from the Rocky Mountain region during the past year.

CONTAGIOUS ABORTION in cows is assuming dangerous proportions. It is found widely distributed throughout the United States. Dr. Van Es reports similar conditions in mares in North Dakota. Dr. M. H. Reynolds, St. Paul, Minn., has issued a popular bulletin on the subject. A special paper on this subject will be presented by Dr. E. S. Good, of Kentucky, under division 4 of this meeting.

DERMATOMYCOSIS has been reported among sheep in Wyoming. The trichophyton tonsurans has been demonstrated. About ten bands have been found affected. Prompt action by the sanitary board and Government will result in its quick eradication.

DEMODECIC SCABIES appears quite widely distributed among both hogs and dogs. It appears sporadically.

DOURINE has again made its appearance in the United States. It was first observed in a stallion in Southwestern Iowa. A special report will be made by Dr. John R. Mohler under section I of the special reports of this committee. Dourine still exists in Canada. This disease is well in hand and is confined to a small section of Alberta.

ENTERO-HEPATITIS has been reported in turkeys from practically every state in the Union. In some sections its loss is serious, causing much financial loss.

EPITHELIOMA CONTAGIOSUM in birds has been reported from the Atlantic, Middle Western and Pacific States. A special paper touching on this subject prepared by Drs. Haring and Kofoid will be presented under division 4 of this meeting.

GLANDERS still appears in the greater part of the United States and a portion of Canada. The identification by clinical signs and other measures and the destruction of diseased animals and disinfection of premises is slowly but surely eradicating the disease from the continent. In most states a small indemnity is paid for the horse that is thus destroyed. Dr. John R. Mohler has recently issued a bulletin on the subject of the "Diagnosis of Glanders by the Fixation of the Complement." In some laboratories the precipitation test as advocated by Konew is used. The laboratory of pathology of the Kansas City Veterinary College, which does the testing for Western Missouri, uses this method. Glanders is practically eradicated from Eastern Canada and an extensive campaign is under way to eradicate it from Western Canada.

GID in sheep is still a serious menace to the sheep industry of Montana.

GRUB in the hides of cattle are very common in the southern part of the United States, but grows gradually less till we reach the Canadian border. In some of the extreme Northern States no grubs are found. Thousands of dollars loss occurs every year in hides of cattle slaughtered during the grubby season.

Grub in the heads of sheep are quite common in the sheep-raising portions of the United States (Rocky Mountain region).

HÆMORRHAGIC SEPTICÆMIA has been reported from Georgia. This disease was also reported from one of the Northern States as occurring in sheep.

HOG CHOLERA is found wherever hogs are raised in the United States. It has been very common in the Middle West

during the past winter and spring. While many of the state experiment stations are producing hog cholera serum, and many private firms as well as some of the biological houses, yet there has not been sufficient serum available to supply all who have asked for it. This disease exists only sporadically in Canada.

INFECTIOUS ANÆMIA is found throughout the United States and is serious in many localities. It is of considerable importance from an economic standpoint in Canada. Much investigation work has been done along this line. Dr. Van Es, of North Dakota, has proven the infectiousness of the urine in these cases. Drs. Francis and Marstetter, of College Station, Texas, have also devoted much time to experimental work along this line. The United States Bureau of Animal Industry has issued a bulletin on this subject as well as the experiment stations of Texas and Nevada.

It has been suggested that the following treatment may prove valuable in the treatment of infectious anæmia: Hypodermic injections (subcutaneously) of 30 to 40 grains sodium cacodylate. This dose repeated every three or four days. This preparation contains arsenic that is not so toxic as white arsenic. It is slowly absorbed and slowly eliminated.

JOHNE'S DISEASE of cattle exists in Oregon, Wisconsin and Tennessee.

LIP AND LEG ULCERATION was first reported to assume a virulent form in sheep in Montana. In August, 1909, it had assumed such a virulent form in Wyoming that a Federal quarantine was placed on several counties in the north central part. Dr. W. E. Howe, Denver, Col., is in charge of the Federal quarantine in the Rocky Mountain district lying east of Utah. Most of the territory has been released, made possible through dipping, hand dressing with hot creolin solutions and prevention of spread through movement of the infected flocks. Additional territory will probably be released in the fall.

MALIGNANT ŒDEMA has been reported in isolated cases both in horses and cattle.

NECROBACILLOSIS other than the form noted under lip and leg ulceration occurs in hogs and calves, especially in the Rocky Mountain districts. The loss among these animals has not been so severe as in other years. For the first time it has made its appearance among hogs and calves in the eastern part of the continent, especially Vermont.

Sheep and particularly lambs develop sore lips when first taken from the range and placed on dry feed in the feed lot and

where the feed consists partly of roughage as alfalfa. These lips usually heal without treatment. In 90 per cent. of the cases investigated through the assistance of the pathological laboratory of the Colorado Agricultural College have been found to become infected by the *Bacillus necrophorus*. As a rule the sheep and lambs readily gain an immunity and recover in from three to four weeks. *Staphylococcus pyogenes aureus* and *albus* and *streptococcus pyogenes* are also found. In those bands in which *B. necrophorus* is not found, recovery is much earlier (ten to fourteen days).

Bulletins on necrobacillosis have been published by the United States Bureau of Animal Industry and some of the state experiment stations.

NODULAR DISEASE of sheep occurs in native, but not in the range sheep. This disease still continues to be a serious problem of the sheep business of the South.

OVINE CASEOUS LYMPH-ADENITIS is still found among range sheep. The losses from this disease is about the same as in other years.

POISONOUS PLANTS continue to cause hundreds of thousands of dollars loss annually. In the plains of the Middle West the *Astragalus mollissimus* and *Aragalus Lamberti* (loco), and in the Rocky Mountain region *Delphinium* (larkspur, several varieties). Among some of the other poisonous plants are the *Cicuta* (water hemlock), *Zygadenus* (death camass), *Lupinus*, *Aconitum* and woody aster. Dr. H. S. Eakins, of the Wyoming Experiment Station, has been doing some very valuable work in the investigation of woody aster poisoning in sheep in that state.

It would be worth the while for every veterinarian to secure from the State Board of Agriculture of Missouri the bulletin recently issued which was prepared by L. H. Pammel. Some of the interesting things found in this bulletin may be enumerated here:

"Many poisonous plants are found in the Missouri Valley which, when ingested in large quantities, cause enteritis, spasms and paralysis. General species of *Equiseta* (horse tail) are found. This plant may be incorporated in the hay and in large quantities cause paralysis of the hindquarters, spasms and death. Warning is also given about the much-discussed Johnson grass and sorghum. The latter, especially when young, frosted or following drought, etc. The offending substance is hydrocyanic acid contained in a glucocyde known as dhuririn. Corn cockle,

and particularly the seed, contains an active principle called saponin, which is poisonous. This substance is not only poisonous for animals but also for fowls. Among the symptoms noted are vertigo, nausea, tenesmus, diarrhœa and impaired locomotion. The crow's foot and rattle-box are also found and known to be poisonous. Horses gnawing at the bark of locust trees have been known to become poisoned; the symptoms are those of stupor, defective vision, inco-ordination of movement, etc. There have been many reports of poisoning on the young sprouts and young roots of cockle burr. The condition produced is one of intense gastro-enteritis.

PARALYSIS of the hindquarters in horses, sheep, pigs and rabbits have been reported from many quarters.

PNEUMONIA verminous, still exists in some bands of sheep in the Southeast and some of the North Central States, as well as cattle along the Gulf.

POLL EVIL AND FISTULA of the poll and withers continues to be common all over the country. The use of bacterial vaccines made from the common pus germs, together with intelligent surgery and after-treatment, makes this disease easy to handle, and the "vet" no longer takes down the back alley when he sees a case coming.

RABIES continues to spread and is now found in nearly every part of the United States. In some localities it is suppressed by effective muzzling ordinances, with destruction of all dogs found on the highways not muzzled. The disease has not been so prevalent in most of the states in the western third of the United States as the year previous, while in the Central States the condition has been more serious.

There is a laboratory in Kansas City in which antirabic vaccine is prepared and sent out, not only for the purpose of vaccinating against rabies in persons, but also in animals. The price for the course of treatment in persons is \$50, and in animals \$25. A dose is sent each day. This laboratory is in charge of Dr. V. Nisbet. There may be other laboratories doing the same. A few cases of rabies have existed in Southwestern Ontario during the past six months, but the disease may be considered under control. No cases have appeared in other sections of Canada.

SCABIES still exists among horses, cattle and sheep in certain districts in the West and Northwest of the United States, but satisfactory progress is being made in its eradication. Scabies

in horses and cattle is reported by Dr. Higgins as being well in hand in Canada.

STRANGLES in horses has been prevalent in most parts of the country during the past spring and early summer. Many are successfully using the bacterial vaccine made from the streptococcus equi, both as a preventive vaccination and as curative.

SYMPTOMATIC ANTHRAX exists more commonly in the western part of the continent, although this disease is reported to exist in Vermont and the Northeast, as well as Canada. Vaccination has successfully combated this disease.

SUGAR BEET POISONING occurs in those parts in which sugar beets are raised, which are principally California, Utah, Idaho and Colorado. Horses, cattle, sheep and hogs are pastured on the fields after the beets are removed. The tops have some of the beet attached (left in the process of topping). The ingestion of large quantities of the top and beet results in a gastroenteritis, and in horses, colic. The changes noted in the organs in a microscopic examination are those of cloudy swelling and focal necrosis, especially noticeable in the kidneys and liver, also passive congestion of same.

STRONGYLOSIS—Many forms of strongyles are found in our domestic animals. More than 90 per cent. of the horses of the Middle West harbor the *Strongylus armatus*. A very able bulletin has recently been written by Dr. B. H. Ransom, of the Zoological Division of the United States Bureau of Animal Industry on "Nematodes of the Intestinal Tract of Ruminants," also one by Mr. M. C. Hall, of the same division, on the subject of "Feces Examination for the Detection of Animal Parasites."

TEXAS FEVER—A closer study of the biology of the fever tick has been made during the past few years, and an excellent bulletin on this subject has been prepared by Dr. Graybil, of the United States Bureau of Animal Industry, giving the results of his investigations, and is published by that bureau.

Satisfactory progress has been made in the eradication of the tick, and much territory is being placed above the quarantine line each year.

Many experiment stations have continued to immunize northern calves by inoculating them with blood from "ticky" cattle preparatory to the shipment of the calves below the quarantine line.

Experiments have also been continued with the view of finding a remedy which would curtail the enormous loss from this disease.

Dr. Mark Francis, of the Texas Experiment Station, in a personal letter to the writer, is of the opinion that he has the question solved and with the doctor's consent will here quote this letter in part:

"I believe that we have found a practical remedy for Texas fever. I have been struggling with this problem for over twenty years and this is the first time I have gotten results that were really promising. We simply inject into the abdomen a 1 per cent. solution of the bimuriate of quinine with urea, giving about one cubic centimeter of the solution for each pound of live weight. You will be astonished to learn that animals with high fever—say  $107^{\circ}$  or more and passing bloody urine—were absolutely normal in less than forty-eight hours. One case died. We found, on post-mortem examination, that the needle did not enter the abdomen proper, but had delivered the solution into the sub-lumbar tissues; so that when one is making the injection, if he finds that the solution is running in slowly, you may be almost certain that your needle is not in the abdominal cavity. We make up this solution in a 1,000 cubic centimeter flask, similar to a wash flask, found in every laboratory. We attach a piece of tubing, say two or three feet long, and a sterile needle on the end of this. We operate on the animal standing. First we scrub the right flank pretty well with soap and water, and shave all the hair in the triangle between the hip bone and the last rib on the right side. Wash the water and soap off with sterile water, dry the skin with sterile cotton, apply alcohol somewhat freely, then swab the area with tincture of iodine. We insert the needle rather low down, just in front of the anterior border of the internal oblique muscle of the abdomen. We made some mistakes in going in too high. We repeat this injection in forty-eight hours, if it is thought best to do so. There will, of course, occur cases that are too far gone before we apply this treatment, that die in spite of anything that flesh and blood can do, but I wish to make the statement now that I believe that I can save 98 per cent. of the cases of Texas fever if we can see them every day."

The doctor further asks all who are in a position to give this further trial to do so, and report same.

TUBERCULOSIS is exacting its usual toll both in human lives and in the lives of the lower animals.

The United States Bureau of Animal Industry in its last annual report gives tabulation of 400,008 cattle tested through-

out the United States by state and government officials, giving as a result 37,000, or 9.35 per cent., as reactors. Of the reactors, 24,784 were slaughtered, of which 98.39 per cent. were found tuberculous.

Dr. D. F. Luckey, State Veterinarian of Missouri, is giving the intradermal test in cattle a practical test in his state work. The following is an abstract from a recent letter which I give with his permission:

"We begun the use of the intradermal test January last. We attempted to verify the results with subcutaneous test and further by post-mortem examinations. We had occasion to give this test a severe trial around Columbia, and I am glad to report that it appears to be a decided success, especially during the summer months. I believe the intradermal test will prove more reliable than the subcutaneous tests. We have not hesitated to condemn cattle upon this test alone. Its accuracy depends largely upon the care in making the injection. We found that unless extreme care was used, the injection would not be properly made. In any animal with a bad history we injected both caudal folds. Age, pregnancy, recent parturition, excitement and weather conditions seemed to cut no figure with the accuracy of the test. Using it, the veterinarian can do his work in daylight. He does not have to wade about in filthy barns during the night. In making the tests around Columbia our men would ride all day, stop at different places, making the injections and tagging the cattle. Anywhere from forty-eight hours to four or five days thereafter (usually on the second day), a re-examination of the same cattle is made with the view to recording the results of the injections. A little swelling sometimes follows from the insertion of the needle, but usually disappears by the end of forty-eight hours. The swelling as a result of tuberculin reaction is usually well marked by that time and persists for about a week. As far as our observations have gone, there is a little uneasiness and switching of the tail noticed in tuberculous animals, beginning a few hours after the injection. There is exfoliation of the epithelium as the reaction disappears."

More states are requiring the tuberculin testing of cattle imported into the states for breeding and dairy purposes. The tuberculous animal is more surely getting under control.

Bellini gives a contribution to the study of the ophthalmic reaction to tuberculin as follows: "Of 200 bovines which were

given the ophthalmic test at Mentone, Italy, 29 gave positive reactions. All the animals were given a careful post-mortem examination, when the reactors were found to be affected as well as three of the animals which had not been detected during the test. The author is of the opinion, however, that the reaction would have been detected in these three animals if they had been constantly observed for a longer period. The reactions appeared once after five hours, twice after twelve hours, once after fourteen hours, four times after sixteen hours and once after thirty-seven hours. The reactions were of short duration in thirteen animals, having disappeared in one-half hour in one case, after one hour in two cases, after two hours in six cases, after three hours in one case and after four hours in three cases. In five cases the disappearance of the reaction was much slower."

I wish to call the members' attention to the recent report on tuberculosis by the Argentine Republic, which gives much data along this line.

Volumes have been written discussing for and against a possibility of a cow eliminating the Bact. tuberculosis through the milk when the udder is not affected. I wish to call your attention to the following extract taken from an article by E. G. Peterson:

"A cow in excellent physical condition was given intravenously 18 c.c. of a bouillon culture *Ps. pyocyaneus*; later 20 c.c. She remained perfectly normal. All examinations of the milk for *Ps. pyocyaneus* were negative. Another cow not in excellent condition, but somewhat emaciated, was given 20 c.c. bouillon culture of *B. coli communis*. All examinations of milk for *B. coli communis* were negative. Likewise the testing of milk after intravenous injections of Bact. tuberculosis all gave negative results."

Tuberculosis has been increasing in hogs at a tremendous rate. It is believed that with the elimination of the tuberculous cow from the herds that the extermination of tuberculosis in hogs can eventually be accomplished through slaughter and disinfection and starting new herds.

Stockmen do not realize the economic importance of tuberculosis among their herds of hogs any more than they do among their cattle.

In the year book of the United States Department of Agriculture for the year 1910, which has just been distributed, we

find the following interesting data. Inspections of meats by the United States Government is carried on in 919 establishments distributed in 237 cities. Of 49,179,057 animals inspected at the time of slaughter, 7,962,189 were cattle, 2,295,099 were calves, 27,657,021 were hogs, 11,149,937 were sheep, and 115,811 were goats. Of these, 113,742 carcasses on account of disease and 874,211 parts, making a total condemnation of nearly 1,000,000.

Tuberculosis was the cause of over 46 per cent. of the condemnations among cattle and over 96 per cent. of those among hogs.

WHITE DIARRHŒA IN CHICKS has been studied the past few years by many experiment stations in the United States. It has been established that there are two forms of white diarrhœa in young chicks. First, a coccidian form due to the coccidium tenellum and a bacillary form due to the *Bact. pullorum*. This latter organism is rod-shaped with rounded ends measuring from three to four microns in length. It is gram negative and stains readily with ordinary aniline dyes. It is readily isolated from the heart blood, liver, kidneys and unabsorbed yolk. Three sources of contamination are recognized: First, the diseased ovary of the hen; second, contaminated incubators or nursery trays, and third, contaminated quarters. Jones has found that 1:1,000 solution of bichloride of mercury will kill them in thirty seconds; 1 per cent. carbolic acid kills in 5 minutes; 1 per cent. creolin kills in five minutes; 3-1/3 per cent. lactic acid kills in five minutes, and 5 per cent. carbolic acid kills in thirty seconds.

The writer has been conducting experiments at the Colorado Agricultural College during the past three years. In investigations to determine an effective remedy the following combination has been found most effective:

|                               |     |      |
|-------------------------------|-----|------|
| Zinc sulphocarbolate .....    | 15  | grs. |
| Sodium sulphocarbolate .....  | 7.5 | "    |
| Calcium sulphocarbolate ..... | 7.5 | "    |
| Mercury bichloride .....      | 6   | "    |
| Citric acid .....             | 3   | "    |

For practical purposes we had this quantity made up into tablet form.\* Then each tablet dissolved in one gallon of water made the required dilution. This was kept before the chicks from the time they are hatched to from five to six weeks, and

\* By the Abbott Alkaloidal Co. of Chicago, Ill., U. S. A.

then every day or two for a few weeks longer. It was found to save 70 per cent. to 80 per cent., whereas the usual number of 15 per cent. to 20 per cent. were saved with other remedies. This combination is found to be useful in other forms of diarrhoea in all the barnyard fowls.

There are many other problems that should be taken up in this report in the absence of other committees to take care of newer things, but space will not permit.

B. F. KAUPP, Chairman;  
C. H. HIGGINS,  
J. R. MOHLER,  
A. T. KINSLEY,  
W. H. DALRYMPLE.

#### REPORT OF THE COMMITTEE ON RESOLUTIONS.

RESOLVED, That the president shall each year appoint a committee of three members of the association who shall, personally or otherwise, as they may deem necessary, investigate the work of the various veterinary colleges of North America, and who shall report regarding each such college at the annual meeting of the association. Any school or college refusing this committee reasonable opportunity for such investigation shall be recommended for exclusion from the list of accredited colleges whose graduates are eligible for membership in this association. That a sum not to exceed five hundred dollars be appropriated from the funds of the association to defray the expenses of this committee.

Resolved, That in the event of any member of this association becoming aware of the falsification by any other member of any mallein or tuberculin test, it shall be his duty to report the facts in writing to the secretary for presentation to the Executive Committee.

We recommend that the annual meeting of this association be extended to five days, and that at least one session shall be devoted to the subject of veterinary education, and said session shall be under the direction of the Committee on Intelligence and Education, and all recommendations emanating from the Association of Faculties and Examining Boards shall be considered at this session.

We recommend that the official report of the Association of Faculties and Examining Boards in the future be published as an appendix to the proceedings of this association.

In view of the fact that the profession is becoming constantly more impressed with the importance of skill and care in the application of the tuberculin and mallein tests, it is suggested that all members shall deprecate, and so far as possible, discourage the practice of employing persons other than qualified veterinarians in the performance of this delicate scientific work.

The Dominion of Canada has for the past ten years occupied and filled a conspicuous place in the field of veterinary sanitary police control work. Sister countries and foreign nations have vied with one another to follow in the pathway of her progress and achievements. Scientific advancement has recorded and chronicled the splendid work done. Canada's leadership and masterly solution of many great problems that encompassed the development of her live stock interests. Her system of control and plans of eradication of contagious and infectious diseases of animals have added a wealth of knowledge in the solution of these questions, many times under the greatest natural obstacles that ever confronted this work. As Veterinary Director General, Dr. J. G. Rutherford has placed his own country and sister nations under a great debt for his splendid work and triumphs in this sphere of service. This association takes this opportunity of bearing testimony of its appreciation of his many valuable contributions to its records, and is justly proud of the great public service he has rendered his own people.

Resolved, That the American Veterinary Medical Association extend its thanks to Major-General Wm. H. Carter, United States Army, for his active, patriotic assistance to our committee during the last session of Congress in the direction of increasing the efficiency of the United States Army veterinary service.

*Communication from the Committee for the Erection of a Monument to the Memory of Professor S. Arloing, Correspondent of the Institute, Director of the National Veterinary School at Lyons, Professor in the Faculty of Medicine.*

LYONS, May 25, 1911.

M. Chauveau, member of the institute, Inspector General, the members of the faculty of the National Veterinary School at Lyons, being of one mind with their colleagues of Toulouse and of Alfort, with the rector of the Academy at Lyons, with the deans, the professors of the faculties of the University of Lyons and their compatriots, and all wishing to honor the memory of Professor S. Arloing, have resolved to raise at Lyons, and at Cusset, his native town, a monument to the savant, the master,

the colleague and the friend. The representatives of the public authorities and of the various academies, societies and associations to which Professor Arloing belonged, have promised to grant their patronage to a public subscription opened for perpetuating the memory of this useful man.

A large committee has been organized, therefore, through which a warm appeal is made to all those who, knowing the work of Professor Arloing, wish to associate themselves with an act of admiration and of justice.

Arloing, as a savant, and as a professor has rendered unforgettable services to veterinary and medical science and instruction. By his researches he contributed in a great measure to the progress of general and comparative medicine.

Being a man of duty, Arloing, by his active propaganda, made known by all means the applications of modern hygienic discoveries, as applied both to man and to animals, and especially with regard to tuberculosis.

In all the above respects Arloing deserves the gratitude of all men.

*The Committee.*

We recommend that the association contribute the sum of \$100 to the committee for the erection of a monument to the late Professor S. Arloing.

Resolved, That this association publish an edition of twenty-five hundred copies of the primer on bovine tuberculosis, which has been prepared by the International Commission for the Control of Tuberculosis, and that it also be printed in the proceedings. Though the work for which the commission was created is now practically completed, it be continued during the coming year, that it may be in a position to defend its recommendations or deal with any new phases of the question that may arise.

We join in an expression of the deepest appreciation in the kindly hospitality of the Dominion of Canada, the Province of Ontario, the City of Toronto, and the local committee of arrangements. We desire to convey to the chairman, Dr. E. A. A. Grange, our hearty assurances that we now fully realize and appreciate the mental viewpoint which prompted him at the San Francisco banquet to so graphically and yet modestly dilate on the various natural advantages of this favored city, which had so much to do with our acceptance of his kind invitation.

We sincerely thank the retiring officers of the association for their earnest and painstaking efforts on behalf of the association during the period its interests have been committed to their care.

A. M. FARRINGTON, Chairman;  
W. H. HOSKINS,  
J. G. RUTHERFORD,  
J. W. CONNAWAY,  
W. L. WILLIAMS.

#### REPORT OF THE COMMITTEE ON NECROLOGY.

Your committee regrets to report that during the past year twelve members have been called to their reward.

PROF. S. ARLOING, dean of the Veterinary School of Lyons, France. Dr. Arloing was one of the honorary members of our society, and one of the most noted members of the veterinary profession. He died March 21, 1911, at the age of 65 years. He was a recognized scientist of the highest class. As a favorite student of Chauveau, the Veterinary Director General of the Veterinary Schools of France, he succeeded him in the chair of anatomy and physiology in 1886. Five years later he was selected as dean of this school. He has held both positions continuously since that time. As a micro-biologist he gained his greatest fame. He discovered the germ that caused "blackleg" and named it the "Bacillus Chauveau," in honor of his beloved teacher, Chauveau. His valuable and extensive work on tuberculosis is classical. He was justly elected an honorary member of the American Veterinary Medical Association in 1898. Many of us had the pleasure of meeting him in Washington, as a member of the International Tuberculosis Congress, in 1908, and were impressed and delighted with his modest, genteel, scholarly and scientific personality. Let us join in sympathy with his host of colleagues and friends in Europe.

HERR PROF. DR. A. JOHNE, Pirna, Germany—During the past year our association has lost another highly esteemed honorary member. Prof. Dr. A. Johne was born December 10, 1839, near Dresden. He received his education at various medical and veterinary schools. He became professor of pathology at the Royal Veterinary College and created a department of veterinary pathology of international reputation. His work with and study

of the anthrax bacillus in the early days of bacteriology is still considered to be classic. He collaborated with Hirschfeld in the publication of a general pathology, in which he wrote the veterinary part. This book was one of the best written scriptures on animal pathology and every student should read this precise and clear publication. Besides publishing many scientific articles on tumors, etc., he was editor-in-chief of one of the leading veterinary periodicals of Germany. He retired from active work as professor in 1905, and lived in a beautiful country home, where up to his last hour his many pupils and friends were received with the kindness for which Prof. Johne was noted. He died on the 15th of December, 1910.

DR. CHARLES F. GOENTNER, Malvern, Pa.—A loyal man to his profession, a good citizen of the community of his adoption, faithful and active for a score of years in veterinary association circles.

DR. WILLIAM A. DRYDEN, Columbus, Ind.—Born at Roxburyshire, Scotland, December 25, 1855. A few years later moved with his parents to Tavistock, Ontario. He attended the Ontario Veterinary College at Toronto, graduating from there March 31, 1882. He departed this life on March 10, 1911.

DR. A. A. HARMON, Flagstaff, Ariz.—A graduate of the veterinary department of the University of Pennsylvania in 1902, and also a graduate of the Massachusetts Agricultural College. He died on November 8, 1910, at Phoenix, Ariz., of hemorrhage of the lungs. Dr. Harmon's colleagues speak very highly of his many manly virtues as a student, teacher and co-worker, and we join with them in their high esteem and greatly mourn his untimely death.

HARVEY E. TALBOT, Des Moines, Iowa.—A graduate of Chicago Veterinary College in 1895. He was Assistant State Veterinarian of Iowa for about fifteen years, and Secretary of the State Examining Board for about ten years. He died July 18, 1911, as the result of glanders, contracted while doing his official duties, from which disease he had suffered for about four months.

FREDERIC A. ILLSTRUP, M.D.V., Willmar, Minn.—Died suddenly while engaged in his professional duties on June 5, 1911, in his forty-third year. He was stricken with heart failure and died before medical aid could reach him. Dr. Illstrup was born at Buffalo, Wright County, Minn., in 1868, and graduated from the Chicago Veterinary College in the early '90s.

J. OTIS JACOBS, Reno, Nev.—A graduate of the University of California, died July 5, 1911. For a number of years he was in the federal service. He resigned about five years ago and entered practice in Reno. To his efficient work as secretary of the Nevada State Sheep Commission much of the success of their work in scabies eradication was due. Dr. Jacobs was a skillful veterinarian, a clean, straightforward man, a good citizen, a loyal friend.

REUBEN R. HAMMOND, Cherokee, Iowa.—A graduate of Ontario Veterinary College in 1885. He formerly lived and practiced in Le Mars, Iowa, but later removed to Cherokee, Iowa, where he died on the 12th of April, 1911, after a lingering sickness covering a period of one year.

ROSSLYN J. STAFFORD, Washington, D. C.—A graduate of Cornell, 1906. Before entering Cornell he had been a student at Colgate University. After leaving Cornell he entered the service of the Bureau of Animal Industry as an inspector, but was later transferred to the laboratory of the pathological division. He was a highly respected man, with lofty ideals and a bright future, and his short period of work as a veterinarian should be an example to us all. He died on June 20, 1911.

HARRY D. FREEMAN, Roswell, N. M.—A graduate of the Kansas City Veterinary College in 1908. He was in the employ of the Bureau of Animal Industry for twelve years before entering the veterinary college. On graduating he immediately entered the bureau as an inspector. He was a self-made man, of estimable character and a faithful employee of our government. He died of tuberculosis, after a lingering sickness, on April 11, 1911.

THOS. G. SHERWOOD, New York City.—A member of the Royal College of Veterinary Surgeons, graduating from the Veterinary College of Glasgow, in 1882. Dr. Sherwood was killed on July 24, 1911, by the overturning of his automobile.

WHEREAS, It has seemed best to Almighty God, in His infinite wisdom, to transfer to other fields of work and usefulness our friends, co-workers and fellow members, Doctors S. Arloing, A. Johné, Charles F. Goentner, William A. Dryden, A. A. Harmon, Harry E. Talbot, Frederick A. Illstrup, J. Otis Jacobs, Reuben R. Hammond, R. J. Stafford, Harry D. Freeman and Thos. G. Sherwood; and,

Whereas, It seems fitting that this association should record its feelings of grief at their loss; therefore, be it

Resolved, That in the deaths of these associates this association feels the loss of personal friends and co-workers, and the profession has also suffered a loss; and be it further

Resolved, That we extend to the family of each the assurance of our sincere and heartfelt sympathy in our common bereavement, and that a copy of these resolutions be spread upon our records.

CHAS. E. COTTON, Chairman;  
 J. A. STEVENSON,  
 G. H. ROBERTS,  
 J. F. WINCHESTER,  
 GEO. B. MCKILLIP.

#### EXECUTIVE COMMITTEE REPORTS.

As a result of five meetings of this committee the following reports are made:

*First Meeting, August 21, 2 p. m.*—On motion, duly seconded and passed, it was voted to recommend to the association that graduates of the Grand Rapids Veterinary College of 1911 and subsequent thereto be recognized as eligible to membership, and that graduates of 1906 to 1910, inclusive, be recognized as eligible five years from the date of this recommendation.

*Second Meeting August 21, 8 p. m.*—On motion, duly seconded and passed, it was voted to recommend to the association that Dr. S. E. Webber be placed on the Honor Roll of membership of the association.

Voted—That we recommend to the association that the Treasurer be and hereby is directed to pay to Dr. C. J. Marshall the sum of one hundred dollars in full for his expenses as chairman of the Committee on Publication in 1910.

Voted—That we recommend to the association that the issuance of certificates of membership be abolished, and in lieu thereof that the Secretary be authorized to issue membership cards suitably inscribed, of pocket size, and to furnish with such cards a suitable case in which the same may be carried.

Voted—That we recommend to the association that the chairman of the Publication Committee receive the sum of two hundred and fifty dollars per annum for his services in preparing the report of the annual proceedings for printing.

*Third Meeting, August 23, 8.30 p. m.*—Voted—That we recommend to the association that the bill for \$47.50 presented

to Dr. J. P. Turner for the printing of a brief on the history of army legislation be paid.

Voted—That we recommend to the association that Dr. F. Hobday, F.R.C.V.S., of London, England, be elected to honorary membership of this association.

*Fourth Meeting, August 23, 12.30 p. m.*—Voted—That we recommend to the association that the following \* applicants be elected to membership in the association:

Voted—That we recommend to the association that the price of the published proceedings of the association to non-members be changed from 60 cents per 100 pages to \$3 per copy.

Voted—That we recommend to the association that the resignation of Dr. A. W. Bitting, Lafayette, Indiana, be accepted.

*Fifth Meeting August 24, 5 p. m.*—On motion, duly passed, it was voted to recommend to the association that the by-laws be so changed that the surety bond required of the Treasurer shall be two thousand dollars, and a bond required of the Secretary in the sum of one thousand dollars.

Voted—That we recommend to the association that the Secretary be directed to establish a card index system as an aid in keeping his accounts and records.

Voted—That we recommend to the association that the Secretary be directed to place the names of all members whose active membership has continued for twenty-five years, and who are otherwise properly qualified, on the Honor Roll of the association.

A. D. MELVIN, Chairman;  
 R. A. ARCHIBALD,  
 JOSEPH HUGHES,  
 E. A. A. GRANGE,  
 C. A. CARY,  
 And Officers of Association, *ex-officio*.

#### ELECTION OF OFFICERS.

Election of officers resulted as follows:

President—Dr. S. Brenton, Detroit, Mich.

Vice-Presidents—Dr. V. A. Moore, Ithaca, N. Y.; Dr. L. Van Es, Fargo, N. D.; Dr. H. Jensen, Kansas City, Mo.; Dr.

\* List published on p. 97.

J. P. Turner, Washington, D. C.; Dr. G. H. Roberts, Indianapolis, Ind.

Secretary—Dr. C. J. Marshall, Philadelphia, Pa.

Treasurer—Dr. George R. White, Nashville, Tenn.

#### PAPERS AND DISCUSSIONS.

A complete list of the papers to be presented, and their authors, was published in the July issue of the REVIEW, and we believe no especial benefit can be afforded our readers by repeating them here. Suffice it to say, that most of them were presented, and where omitted it was usually not the author's fault, but because of lack of opportunity. President Glover did his utmost to make use of all the talent that was on hand by running two sessions from the very beginning; but the program was very large, and it is likely that some were not afforded an opportunity to present their papers, and many excellent papers presented were, unfortunately, not discussed for the same reason.

#### THE CLINIC.

The entire last day was devoted to operations upon the large list of subjects Dr. Fowler and his committee had gathered at the operating room of the Ontario Veterinary College, rear of No. 153 Richmond Street West. A complete report of this clinic, together with a report on the condition of each subject operated on, to date, will be published in the next issue of the REVIEW.

#### THE BANQUET.

The banquet was held at the famous McConkey's on Thursday evening, August 24, and was largely attended. The fact that Dr. Rutherford officiated as toastmaster is sufficient evidence that the evening was an enjoyable one and the banquet a success. The following toasts were responded to:

"The King" ("God Save the King"). "The President of the United States" ("The Star-Spangled Banner"). "The City of Toronto," Mayor Geary. "Contributors to the Advancement of Veterinary Science," Dr. W. Horace Hoskins. "The Live-Stock Industry of Canada," Dr. G. C. Creelman. "Veterinary Sanitary Service," Dr. A. D. Melvin. "The Royal College of Veterinary Surgeons," Professor Hobday, London. "Veterinary Education in the United States," Dr. G. H. Glover.

"Veterinary Education in Canada," Dr. E. A. A. Grange.  
"The Practitioner," Dr. Fred Torrance. "The Pacific Slope,"  
Dr. S. B. Nelson and Dr. R. A. Archibald. "The Press," Dr.  
R. W. Ellis. "The Ladies," Dr. R. P. Lyman.

Dr. Rutherford explained that it was customary at affairs of that kind in English countries to have a toast to the King, and asked the audience to rise and drink a toast to "The King," whereupon the orchestra struck up the national air, to which the Canadians present responded in song, as did also a few from the States. The toastmaster permitted them to resume their seats after the singing and then asked them, almost immediately, to rise and drink a toast to "The President of the United States." The great majority, being from the States, stood ready to burst forth in "The Star-Spangled Banner," but the orchestra, which was Canadian, "failed to produce," and after several ineffectual attempts to strike the air, gave it up. The incident produced sufficient amusement, however, to make up for the failure in the patriotic outburst. Between the toasts given above, the banqueters were also treated to a little diversion by a character artist, who appeared upon the orchestra balcony and sang several sketchy little songs. So that, altogether, the banquet was a very nice affair.

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## THE PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

The Pennsylvania State Veterinary Medical Association held a successful and highly satisfactory semi-annual meeting at the Monongahela House, Smithfield and Water streets, Pittsburgh, Pa., September 5, 1911.

Forty-six members responded to roll call and twelve guests attended the entire session.

The following papers were read and ably discussed:

E. A. Cahill, "The Value of Serum Therapy to the General Practitioner."

S. H. Gilliland, "The Control of Rabies."

H. P. Hoskins (read by W. H. Hoskins), "The Treatment of Pneumonia and Pleurisy."

T. E. Munce, "Closer Relationship between the Veterinarian and the State Livestock Sanitary Board."

Twenty applicants were favorably considered, and the following names added to the membership list: Daniel M. Mackey, Cameron, W. Va.; C. H. Huber, Rural Valley; John O. Eymann, McKeesport; C. W. Mayer, Sunbury; Henry H. Haigh, Philadelphia; P. L. McBreen, New Kensington; Anthony Montgomery, Elderton; S. E. Bitler, Turbotville; John F. McDonough, Philadelphia; J. C. McNeil, Pittsburg; F. N. Sherrick, Connellsville; W. E. Wight, Kullare; F. G. Whitehead, McKeesport; John H. Turner, Wellsboro; Benj. Gunner, Sewickley; M. P. Hendrick, Meadville; W. S. Gimper, Harrisburg; D. R. Royer, Jamestown; Jas. L. Doritt, Union City; J. H. Wise, Time.

Luncheon and dinner was provided for to all the members of the Association on invitation by the Western Pennsylvania Medical Association.

JOHN REICHEL,  
Secretary.

LIST OF ACCREDITED VETERINARY COLLEGES (U. S. Dept. Agr., B. A. I. Circular 150-A)—The following list of accredited veterinary colleges, graduates of which are eligible for the civil service examination for the position of veterinary inspector in the United States Department of Agriculture, Bureau of Animal Industry, is hereby approved in lieu of that published in Regulation XXIV. of Bureau of Animal Industry Circular 150, "Regulations Governing Entrance to the Veterinary Inspector Examination:" \*

Alabama Polytechnic Institute, College of Veterinary Medicine.  
Chicago Veterinary College.  
Cincinnati Veterinary College.  
Colorado State College, Division of Veterinary Science.  
George Washington University, College of Veterinary Medicine.  
Grand Rapids Veterinary College. †  
Indiana Veterinary College.  
Iowa State College, Division of Veterinary Medicine.  
Kansas City Veterinary College.  
Kansas State Agricultural College, Veterinary Department.  
McKillip Veterinary College.  
New York-American Veterinary College.  
New York State Veterinary College.  
Ohio State University, College of Veterinary Medicine.  
San Francisco Veterinary College.  
State College of Washington, Veterinary Department.  
University of Pennsylvania, School of Veterinary Medicine.  
University of Toronto, Ontario Veterinary College, to include only those graduated during or prior to 1897.

\* This list is subject to change. The failure of any college to comply with the provisions of the regulations will necessitate removal from the list.

† To include only those graduates who have pursued the study of veterinary medicine at this college or in some other accredited college for three years.

## NEWS AND ITEMS.

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### A. V. M. A. NOTES.

A MOTION was passed by the A. V. M. A. to hold a five-day session instead of four days. This, with the day for the "Associated Faculties," will make six busy days.

A RESOLUTION was passed in the "Associated Faculties" asking the A. V. M. A. to print its proceedings and papers; same was also passed by the A. V. M. A.

A RESOLUTION was passed in the Associated Faculties and Examining Boards, asking the secretary of said association to compile a list of officers and members of state boards and send a copy of same to all members of said association.

A RESOLUTION was passed condemning the practice of certain agricultural colleges encouraging agricultural students to conduct tuberculin testing, it being thought that sooner or later this practice would bring the work in disrepute.

THE pathologists in attendance at the Toronto meeting met and decided to ask a division in the program of the A. V. M. A. next year, in which purely technical papers will be presented and discussed. These to be along the line of pathology and bacteriology.

A RESOLUTION was passed in the Associated Faculties and Examining Boards that a committee be appointed to direct the attention of the post-office authorities to the fact that correspondence schools purporting to give veterinary training are frauds; and thus put them out of business by excluding their mail from the mails.

AS THE result of the presentation by Dr. I. E. Newsom (Professor of Anatomy, Division of Veterinary Science, Colorado State College) of a paper on anatomical nomenclature, calling attention to its chaotic condition, a resolution was passed in the "Associated Faculties" to the effect that the incoming president (Dr. S. Stewart) appoint a committee on anatomical nomenclature, to report to said association at its convenience.

THE resolution adopting the uniform degree Doctor of Veterinary Medicine to be abbreviated "D. V. M." which was passed by the Missouri Valley Veterinary Association, the Chicago Veterinary Association and the Association of Federated Colleges, was passed by both the Association of Veterinary Faculties and Examining Boards and the American Veterinary Medical Association.

#### HORSE SHOW NEWS.

Forty thousand dollars in cash, in addition to numerous trophies and prizes will be awarded at the last horse show which Madison Square Garden will house from November 18 to 25 next, according to the preliminary list issued the first week in September by the directors of the National Horse Show of America, Limited.

This small fortune will be divided among 152 classes embracing every type of horse from the Lilliputian Shetland pony to the Brobdignagian Clydesdale. It will be the twenty-seventh annual exhibit of America's premier horse show organization, and it bids fair to excel all of its predecessors from an entry, quality and spectacular standpoint.

While the international military contests in which the crack riders of Europe will compete against Uncle Sam's cleverest cavalymen may be second to the exhibition at Olympia in point of entries, judging from the picked riders who are coming it should equal, if not excel the London show in execution.

Lieutenant C. F. Walwyn, of the Royal Horse Artillery of England, who won the Canadian Challenge Cup, presented by the Hon. Adam Beck, of Toronto last year, on his horse "The Nut," is coming over to defend the trophy; and accompanying him on the British team will be Colonel P. A. Kenna, V.C.D.S.O., Lieutenant Walter Brooke and Lord Decies, who married Miss Vivian Gould last year. The names of the other European officers who are coming will be announced later on.

Thirty-six of the 152 classes are to be judged as breeding stock. There are no changes in the classification for runners and trotters from last year. There are two classes for Morgan horses with prizes aggregating \$350 for stallions, 4 years old and over, and mares 4 years old and over.

Frederick M. Davies has offered prizes for an entirely new class this year for horses and delivery wagons. The horses are to

be shown in single harness to delivery wagons and must have been used for local delivery for at least three months before the time of closing the entries.

Alfred G. Vanderbilt, president of the National Horse Show Association, offers two cups in addition to cash prizes of \$1,890 for two of the great breeds of draft horses—Clydesdales and Percherons.

J. W. Harriman offers the "Nala" Challenge Cup, valued at \$850, for the best horse suitable to a gig, and one of the conditions is that professional drivers and dealers are not allowed to compete for it.

Robert A. Fairbairn, chairman of the Executive Committee, presents a cup in addition to a cash prize of \$150 for the spectacular event of the week—the broad water jump. The first trial commences at 15 feet, and is widened one foot at a time until the contest is decided.

The International Horse Show of London presents two champion cups, valued at \$500, one for horses over 15 hands 2 inches having taken a first or second prize in single harness at this show, and the other open to pairs having taken a first or second in double harness.

The English Hackney Society donates a gold cup, value \$500, for the best mare or gelding sired by a stallion registered in the English Hackney Stud Book, to be shown in single harness to a four-wheeled vehicle. This cup has to be won three times by the same exhibitor before it becomes his property. J. W. Harriman won it with "Lady Dilham" in 1907 and 1908, while Judge Moore annexed it in 1909 and 1910 with "Lady Seaton," so that a win this year for either Mr. Harriman or Judge Moore will be for "keeps."

Jay F. Carlisle's \$600 cup is for park teams (mares or geldings), to be shown before drags and to be driven by amateurs. This cup must be won twice by the same exhibitor. Fairmont Farms got a leg on it in 1909, and Judge Moore won it last year.

R. C. Vanderbilt and J. W. Harriman offer three cups in class 95 for ponies in harness not exceeding 12 hands 2 inches, to be driven by boys or girls (amateurs), under 12 years of age, the sons or daughters of gentlemen who are not in any way professionally interested in the purchase or sale of horses. E. Von der Horst Koch presents a champion cup in class 96, in which all ponies winning first and second prizes in classes 90, 92, 94 and

96 must compete, or they will forfeit the prize money and ribbons in their several classes.

Judge Moore gives a champion cup for heavyweight hunters. James T. Hyde offers \$50 in plate to lady riding the winner in class 127 for thoroughbred, green or qualified hunters. John McE. Bowan gives a cup for children's ponies, mares or geldings not exceeding 12 hands 2 inches, four years old or over. Richards M. Woods' \$200 cup in class 128 is for three qualified hunters from one hunt to be shown by the master, whips or members of the hunt in hunt uniform.

Rufus L. Patterson offers a challenge cup, value \$250, in class 109 for ladies' saddle horses not under 15 and not exceeding 15.3 hands. Fell Lowry's \$150 cup is for lady's saddle horse, over 15.2 hands, four years old or over, up to carrying 160 pounds. Must be ridden by ladies on side saddles, but this rule does not apply to preliminary trials.

E. T. Stotesbury, of Philadelphia (J. Pierpont Morgan's partner), offers a cup open to pairs of horses over 15 hands and not exceeding 15.2 having taken a first at this show. Alfred B. Maciay's cup is for hunters that have been hunted at least eight times during the season of 1910-11, with some recognized pack of hounds. F. Ambrose Clark gives a cup, value \$150, in class 135 for thoroughbred mares or geldings not under three or over seven years of age and not under 15.3 suitable to become hunters. J. Murling presents two cups in class 139 for teams of two officers of the same nationality, the fences to be taken two abreast (twice around).

Charles A. Baudoine gives a \$200 cup for pairs of mares or geldings to be shown to a lady's phaeton and ladies to drive. Brewster and Company give a \$200 cup for pairs of horses (mares or geldings), to be shown before a demi-mail, spider or Stanhope phaeton for park use. Fiss, Doerr and Carroll present a \$500 cup for road teams four years old or over, while Louis Sherry has donated a cup for the best collection of three harness horses, not under 15 hands, to be shown in single harness.

The Hotel Martinique presents the American Cup, value \$750, for jumping the course by teams of three officers of the same nationality (twice around). The Plaza Cup is for heavy chargers up to carrying 210 pounds. The Holland House offers a cup for the best saddle horse, while the Waldorf-Astoria Challenge Cup, presented by George C. Boldt, is for the best hackney or halfbred hackney (mare or gelding) bred in America, to be

shown in single harness to an appropriate two or four-wheeled vehicle.

As usual the competition for the Arrowhead Inn Challenge Cup, presented by Ben Riley for road teams, will be the feature of the opening afternoon's program.

A select number of the best riders in the New York traffic squad will compete in class 122.

Eighteen judges of both national and international fame will award the \$40,000 in cash and other trophies which will be contested for.

Lord Decies will have associated with him in judging the officers' chargers and militia mounts and in awarding the ribbons in this class, Colonel William Hendrie, of Hamilton, Canada, and Major Henry T. Allen, U. S. A., Washington, D. C.

Two Canadians, Dr. Charles McEachran, of Montreal, and Colonel William Hendrie, of Hamilton, will pass judgment on the Clydesdales, Percherons and Heavy Draft Teams.

Senator Joseph W. Bailey, the silver-tongued orator of Texas, will judge the trotters and roadsters in conjunction with Horace White, of Syracuse, N. Y., and De Witt C. Flanagan, of New York City.

John E. Madden, of Kentucky, is the sole judge of thoroughbreds, as is Joseph E. Widener, of Philadelphia, in the classes for ponies in harness, pony tandems and four-in-hands.

E. Von der Horst Koch and John R. Townsend, of New York, are the jurists in the Harness Horse, Four-in-Hand, Tandems and Appointment classes, while A. S. Craven, of Greenwood, Va., and D. B. Sharp, of Berwin, Pa., will judge the Hunters and Jumpers.

Those who will select the prize winners in the classes for saddle horses and ponies under saddle are R. Lawrence Smith, Smithtown, L. I.; Joseph Laroque, New York, and S. Taber Willets, Roslyn, L. I.

G. Howard Davison, of Millbrook, New York, will select the winners in the Hackney and pony breeding classes, and R. L. Agassiz, of Boston, will judge the polo ponies, polo pony stallions with get, and brood mares.

Secretary James T. Hyde announces that entries for all classes close on Thursday, October 26.

# AMERICAN VETERINARY REVIEW.

NOVEMBER, 1911.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, September 15, 1911.

FOOT-AND-MOUTH DISEASE.—I did not intend to take part of one of my chronicles to speak of the extensive outbreak which, since some months, has gradually spread all over Europe, nor do I intend to say much about it even now; and yet, I feel that I would not do justice to the objects of my monthly writings if I should let this general outbreak to go by without being noticed. All the veterinary journals speak of it more or less. Of course, it prevails in their country. And not only this press, but the agricultural and the daily papers have lent the hospitality of their columns for publications on foot-and-mouth disease.

This outbreak, however, presents nothing peculiar except its extent. It runs its ordinary course as usual; it gradually and insidiously spreads from one place to another, from one farm to another, from one state to another, and to-day it may be said that there is not one part of old Europe (with rare exceptions), which does not register its presence in its official sanitary bulletins. As an evidence to this, I may present the information obtained from the *Veterinary News* in relation to certain diseases of animals which are prevailing in some countries and from which I merely extract those where foot-and-mouth disease is found, and from those only five states are found free from infection.

shown in single harness to an appropriate two or four-wheeled vehicle.

As usual the competition for the Arrowhead Inn Challenge Cup, presented by Ben Riley for road teams, will be the feature of the opening afternoon's program.

A select number of the best riders in the New York traffic squad will compete in class 122.

Eighteen judges of both national and international fame will award the \$40,000 in cash and other trophies which will be contested for.

Lord Decies will have associated with him in judging the officers' chargers and militia mounts and in awarding the ribbons in this class, Colonel William Hendrie, of Hamilton, Canada, and Major Henry T. Allen, U. S. A., Washington, D. C.

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Austria is mentioned with 7,952 animals affected; Belgium with 1,464 infected centres; France with 3,958; Germany with 20,793; Holland with 18,241 outbreaks; Hungary with 7,480; Italy with 1,549, outbreaks involving 29,540 animals; Russia with 77,126 cases in 1,350 communes; Servia with 139 cases in four arrondissements; Switzerland with 17,879 animals. At last report, England's sanitary returns reported only 8 outbreaks with 425 diseased animals. Bulgaria is also infected; to what extent is not stated. Denmark, Norway, Roumania, Spain and Sweden at this last report were free from disease.

The above record shows indeed what enormous foothold the disease has taken this year in Europe, making undoubtedly a record of unusual extent to the credit of this plague.

So far England, with the severe measures prescribed by Governmental regulations, has, in comparatively short notice, effectually succeeded in protecting herself from extensive spreading, and it is certain that she will, with no difficulty and at comparatively small expense, free herself again on this occasion. Her stamping-out process has always been a success and will again. Of course, for European countries it is a method which cannot be applied, not only because it would prove too expensive but also because it would be necessary to resort to it too often so long as sanitary measures applicable all over do not exist or will not be enforced. And even then, there is yet so much to be learned in relation to the whole pathology.

America is now free from foot-and-mouth disease. How long will she be? Anyhow, the sanitary measures of the Bureau of Animal Industry will soon get rid of it, should it by chance or bad luck find its way across the Atlantic.

It may not be impossible, so, Doctor Melvin, look out!

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If it should, however, there is a satisfactory consolation. It is the fact that what has occurred lately in France will certainly not take place in America. It may not be very necessary to

allude to what has taken place here lately, but as it has a lesson in it I may as well point it out.

As in all cases of the presence of any epidemics, it is frequent all over the world, I imagine, to see numerous panaceas proposed to relieve, cure and prevent the attack for either men or animals. Such, of course, has been done here with foot-and-mouth disease; and I mention it as it might find its way to America and some of our people be induced to neglect the sanitary regulations of the bureau and try the wonderful cure. Who knows, as it is claimed to cure almost all the diseases of living creatures—I should not be surprised if even at this hour my warning will not be useless.

I refer to a certain preparation sold under the name of Pamphagine under the form of a phagogeneus liquid, which has been introduced, patronized and boomed by a surgeon in Paris, who has a certain reputation as such in America, Doctor Doyen. The experiments which the doctor has had the opportunity to carry out have failed to give the results promised; and notwithstanding all the noise made through the press, it has received many hard and fatal blows, among which I pick out the following, in the shape of resolutions addressed to the authorities of the sanitary board by a sanitary departmental veterinarian. It says: (1) The phagogeneus liquid does not confer immunity; (2) it does not seem to shorten the duration of the disease; (3) the accidents to the feet, which are accompanying aphthous fever, are as frequent and serious as those observed on animals treated with ordinary methods; (4) numerous animals injected with the liquid have often had enormous swellings requiring long and costly treatment and which sometimes were followed by rapid and fatal terminations.

These conclusions were confirmed by many others similarly.

The question is settled as far as the value of this treatment. But how is it that it should have been allowed to be tested so extensively as it has, without any scientific control, without being stopped from the start as long as the sanitary laws in France forbid anyone from treating animals affected with contagious

diseases unless he be a veterinarian and, I believe, a sanitary veterinarian at that?

I believe such rules exist also in other countries where sanitary laws prevail; certainly it does in America; but in France, unfortunately, there is no law regulating the practice of veterinary medicine, no law protecting veterinarians, and anyone can treat animals—and, it seems, even contagious diseases—although it is against the law!

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TRYPANOSOMES AND TRYPANOSOMOSSES.—The literature on this subject is very abundant; so much so, indeed, that unless directly interested in it, the scientist may have difficulty to collect all the new facts which, since late years, have found their place among those already established. It was to remedy this that Prof. G. Marechal has published in the *Journal de Zootechnie* a concise review of several points relating to these parasites and the diseases due to them, namely, upon the evolution of the parasites, the principal and satellite physiological species, their pathogenic action, diagnosis and treatment. First a few words are said of the morphology of the trypanosomes. They are protozoas provided with a floating membrane, a flagellum and a posterior centrosome. Almost all live as parasites in the plasma of the blood of vertebrates. Their body, microscopic, fusiform, often bent or tortuous, is essentially composed of a *protoplasmic* mass, of an oval submedian *nucleus* of a lateral *undulating, floating* membrane, more or less twisted helice-like, and finally of a *flagellum*. This last seems to be inserted at the anterior extremity, but in reality it follows the border of the floating membrane and ends in the neighborhood of the posterior extremity, on a small nucleus called *centrosome* or *blepharoplast*.

In relation to their evolution, trypanosomes multiply by a *sexual* process, in the blood, by equal or unequal *longitudinal bipartitions*. The division begins about the same time in the centrosome and the nucleus, then progresses from backwards for-

wards to the undulating membrane and the flagellum; it is then that the protoplasmic body is progressively divided in two by a longitudinal slit. Generally there is no reproduction by *multi-partition*.

*Sexual reproduction is not yet known* although recent works indicate that there is one. Trypanosomes, indeed, are like Hemosporidae, inoculated by bloodsucker insects. And the experiments of Kleine have demonstrated that flies contaminated by a sick individual may, after having been infecting during the hours that follow, then stop being so, to become so again from fifteen to thirty days after and remain dangerous for a month or two. This fact of transmission at long intervals shows evidently the existence of an incubation, of a probable evolution of the protozoa in the body of the insect, incubation corresponding to the duration of the evolution in the fly, from the moment of its infection to that of its passage through the trunk of the insect.

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There are numerous species of trypanosomes. Almost all parasites of the blood plasma of vertebrae, they are exaglobular hematozoas. Some fifteen of these species are pathogenous for man or domestic animals, to which they are inoculated by various bloodsucker insects and give rise to epizootic diseases extremely severe and fatal.

The distinction between these species is often difficult, as morphology allows only to differentiate five or six; but several forms, apparently identical, are nevertheless considered as specifically distinct, because their physiological properties are not the same, or because they are not pathogenous for the same animals, or, again, because they do not vaccinate against each other. However, six *morphological* species are recognized, round which a certain number of *physiological* have been grouped.

Among the former are: (1) *Tryp. Evansi* in the blood of all domestic mammalia, except the small ruminants; (2) *Tr. Equinum* the agent of cadera in equines; (3) *Tr. Congolense* patho-

genous for all domestic mammalia; (4) *Tr. Dimorphon* (*T. pectorum*, *T. confusum*) in all domestic mammalia of equatorial Africa; (5) *Tr. Theileri* in the blood of cattle, is but little pathogenous; (6) *Tr. Gambriense*, cause of the human trypanosomiase, the sleeping sickness.

Among the satellite physiological species are grouped: (1) Those of the *Tr. Evansi* are: the *Tr. Brucci*, agent of the Nagana; (2) of the *Tr. equiperdum* agent of the Dourine among equines; (3) of the *Tr. Casalbouii*, the *Tr. Angolense* the agent of the *Souma* of equines and bovines; the *Tr. Soudanense*, agent of the tahaga of Camelidae; the *Tr. Togolense*, which attack the bovines of the Togo; the *Tr. Venezuelense*, the equines of Venezuela; the *Tr. vivax* in the ruminants of Cameroun; (4) of the *Tr. Congolense*, the *Tr. nanum* specific to bovines in the Soudan; (5) of the *Tr. Dimorphon*, the *Tr. Pccaudi* agent of the baleri in mammalia of Senegal; the *Tr. Montgomeri* in cows of the Rhodesia; the *Tr. Hippicum* of mules in Panama; (6) of the *Tr. Theileri*, the *Tr. ingens* of cattle and antitops.

Among other forms there are: The *Tr. Lewisii* of blood of rats inoculated by lice and fleas; the *Tr. Americanus*, observed in cultures of blood from American cattle; the *Tr. tuniculi* of rabbits; the *Tr. Calmettei* found in hens; the *Tr. avium* in partridges and guinea hens; the *Tr. rotatorium* of frogs; the *Tr. granulorum* of eels; the *Tr. Ziemanni* and the *Tr. noctuae* of mosquitoes.

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Trypanosomes give rise to epizootics which are so much more serious that they are found in the whole world, and that for most of them they are likely to affect all the domestic animals indifferently. However, they are ordinarily less dangerous with small ruminants than with equines and bovines, especially these last, where the mortality has been seen to reach 80 and 100 per cent. of affected animals.

The principal symptoms are a fever, generally intermittent in character, anemia, great loss of flesh, troubles of the circulation or of the nervous system.

The diagnosis is made by the microscopic examination of the blood or of the serosity of the external swellings. The parasites are found in the plasma and not in the globules. Several preparations must be made, as it often occurs that the parasites are only few. The method of cultures is also advisable. Made on artificial media, on gelose blood, bouillon blood, they are readily reproduced.

In relation to the treatment, three methods have been resorted to: 1. *Vaccination* which would be the ideal process, but is yet to be found. *Serotherapy* had promised much, but so far has given no results. 2. *The destruction of the agents of inoculation* has been advocated. The means are yet to be found to realize this. All that has been obtained in this direction is to chase, to expel them from the well-known regions where they inhabit. This might be successfully resorted to by cutting off or destroying the vegetation, bushes, etc., of the places where they gather. For *mechanical* protection of the animal, net and gauze coverings are indicated. 3. *The destruction of the parasites* can be obtained by the immediate and systematic slaughter of all diseased animals. Radical method less costly than the one of chemical drugs. Atoxyl, orpiment, tartar emetic, trypan-red, arsenophenylglycine, have some recoveries to their credit which have proved lasting and radical. Surra is the only one among the trypanosomes which has resisted the most in being cured with certainty by orpiment, alone or associated to tartar emetic or atoxyl.

WILLIAMS' OPERATION FOR ROARING.—But a few days ago at the meeting of the American Veterinary Medical Association in Toronto, this important subject was the occasion for remarks and discussion which, by the program, I am informed, were to be treated by the father of the operation, Prof. Williams of Cornell, and by its principal propagandist, Prof. Hobday of London. It may not be too late to have France join America

and England on this occasion, and to that effect I send the conclusions that were offered at the last meeting in July of the *Societe Centrale de Medicine Veterinaire de Paris* by Mr. Drouin, the reporter of the committee appointed to examine a long communication presented by Dr. Williams to the effect of describing the operation, relating the whole history, experiments, final technics, results so far obtained, and so on, and finally his claim to the priority of paternity of the operation. The long paper offered to the society was addressed to me, and as president it was my pleasant duty to refer it to the examination of a committee composed of Profs. Cadiot, Almy, and Mr. Drouin, the reporter. I will not consider this report, which makes a close analysis of Williams' article, but will point out principally the conclusions relating to the priority claimed by Williams which can no longer be discussed.

Mr. Drouin says: "If Gunther has made allusion to the extirpation of the ventricular sac, he has given only a very brief description of his experimental trials, and it seems certain that he has had but little opportunities to apply it in practice, as in his most recent publications he acknowledges to have never used it but for demonstration. The operation does not reach its object and he advises tracheotomy. It would then appear greatly unjust to reproach Williams, as it has been done, to have merely copied Gunther. That he may have been inspired by reading of it, that he may have become acquainted with the unfinished attempts, nothing is more natural. But he has made of the operation that he *preconises* a well-defined operation, one which he has modified, has improved by many successive efforts and trials, and which, with all dues, deserves the name of '*Williams' operation.*' It is thanks to his persevering activity that the ablation of the laryngeal ventricles has become an operation of common practice in America as well as in England."

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But while Mr. Drouin gives Prof. Williams what is due him, he also takes the opportunity of giving his opinion upon some

points relating to the technic of the operation, opinion which is of great practical value, as may be seen by the following from the *Bulletins de la Société*.

Indeed, to be well acquainted with what difficulties the operation might present and to possibly appreciate its efficacy, Mr. Drouin, guided by the described technic, performed the operation several times and modified some of its steps, and says: "On the first of our cases operated, we had resorted to general anesthesia by peritoneal injection of chloral. But if one obtains great facility in the complete insensibility of the patient, there results from the use of chloral an hæmorrhage in sheet which is very troublesome. In the other operations that we performed we did not resort to general anesthesia, but only to *local insensibilization with a mixture of cocaine and adrenalin*. In these conditions the operation is much simplified, the field of operation remains almost bloodless, and the movements of the patient are very limited.

"What has appeared to us the most indispensable precaution has been to place a tracheotomy tube about the second day, if a constant watching during the night cannot be carried out. We nearly had a fatal accident for neglecting this measure. Dressings with peroxide only were resorted to. Recovery complete in a month."

In conclusion of his long report Mr. Drouin says: "Time only will permit a definitive judgment on the operation of Prof. Williams; but his work is one of those that do honor to our profession; the minutix, the vigorous method in which every point of the report is presented, shows on the part of the author a constant desire of perfection which is the stamp of all inquirers. Your committee proposes, in addressing Prof. Williams its very great thanks, to enter his name on the list of candidates to membership of foreign correspondent.

\* \* \*

SEA PLASMA.—Under this name is known in France the injectable isotonic sea water whose special use is at present well

known. Indeed, by most severe analysis the absolute identity of the vital plasma of all the organisms in the entire zoological series with sea water has been well demonstrated, although it is well understood that between the sea plasma and the cellular plasma there is only an analogy of composition and not one of molecular concentration; the physical state is alone different.

To this special point of view of saline concentration of the cellular vital plasma, herbivora present this peculiarity, viz.: that to satisfy the physiological tendency of their tissues, these animals must maintain their internal medium to a normal stand of chloride of sodium with an alimentary supply extremely poor in sodium. The sodium supply is then constantly within the boundary of deficiency; as soon as this state is established, the organism is deprived of one of its indispensable chemical compounds and thus loses all its reactive power and means for struggling against morbid causes in general.

Under such conditions, say Messrs. Darbot and Augustin in the *Révue Générale* it is easy to understand that therapeuty, in resorting to injection of isotonic sea water or Sea Plasma, which has given such brilliant results in human medicine—where, however, the sodium proportion can be so easily kept up to normal by the mode of feeding—must be for veterinarians a very valuable assistant to increase the reacting organic power of the functions of their patients.

With this object in view they have used this mode of treatment in several instances and give the minute record of two—one in a rebel case of suppurative sinusitis, where they obtained a reduction and later entire disappearance of all the symptoms, but not radical as there was a relapse later, and another in a case of infectious meningo-myelitis following distemper in a dog, which recovered completely.

Besides these, the writers have made other trials with this mode of treatment which, while costly, they recognize will probably be resorted to only for animals of great value, and they think it is indicated: (1) in acute inflammatory diseases (pneumonia and pleurisy), in serious effections such as tetanus,

strangles, typhoid fever, pasteurellose, although its action is not specific in these diseases; (2) in suppurative diseases (sinusitis, various abscesses, extensive traumatisms), where its action is very manifest and improves all the symptoms; (3) in enteritis, where its action is specially specific; (4) during the convalescences of infectious diseases where the sequelae are often so dangerous for valuable animals, such as those of synovitis, rheumatismal myositis, irido-cyclitis after distemper or pasteurellose, meningo-encephalitis of dogs, etc.

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The technic of the treatment is simple. The sea water or plasma used in medicine is the water from the sea prepared by special method which is sold in glass tubes, similar to those where physiologic serum is kept.

Applied to large animals, the injections are made in the neck in front of the shoulder; careful antiseptic preparations of the surface are applied.

At one end of a fine rubber tube about two meters long the needle which will make the puncture is fixed. Both are sterilized by boiling. The straight point of the glass tube is broken and introduced in the other end of the rubber tube. The glass tube is secured about one meter and a half above the point of puncture. Then this extremity is broken and some of the contents are allowed to escape before the puncture is made. A saline taste of the running fluid tells that everything is ready for the puncture. It requires about half an hour for an injection of 500 c.c. The operation ended, the wound is dressed with a little collodion. The injection is perfectly painless. A slight reaction follows in twelve hours but soon subsides. Injections are followed by extraordinary condition (euphoria) characterized by quick movements, stimulated, lively physiognomy, frequent neighings, greater activity in working, increased appetite, more abundant urinary secretion.

Injections must be made every two or three days and kept up, beginning by small doses 200 or 300 c.c. the first week, to

reach 1,000 c.c., then reduce by degrees to 500, 300, and stop.

It is better not to arrest the treatment too soon.

This is a new method of treatment which, it is hoped, may give as good results as it has in human medicine.

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DR. J. G. RUTHERFORD.—The following appreciation from an English paper, the *Veterinary Record*, will prove gratifying to Dr. Rutherford. His precious qualities, professional ability and the value of his services have been brought to a sudden end for private causes. All his friends in the profession, in America, have regretted his voluntary retirement, and will read with interest the expressed feeling of our English *confrère*:

“Federal agriculture at Ottawa loses an invaluable servant through the resignation of Dr. J. G. Rutherford, Dominion Veterinary Director General, and Live-stock Commissioner. John G. Rutherford first saw the light of day in Peebleshire, Scotland, having had the fortune to be born a minister’s son. He was educated in Glasgow and arrived in Canada in September, 1875. Like so many of his countrymen, he found in the Dominion a field to develop his native calibre, and his career has been marked by a brilliant course of professional and administrative success. From 1889 to 1901 he practised veterinary medicine; was elected to the Manitoba Legislature in 1892, serving till 1896. In 1897 he was elected to the Dominion House of Commons. Subsequently entering the Department of Agriculture, he was in 1904 made Veterinary Director General and in 1906 was called to fill a dual capacity as Veterinary Director General and Live-stock Commissioner. In both spheres he has achieved conspicuous success. His work in suppressing contagious diseases of animals in the West and elsewhere has been thoroughgoing and proportionately successful. As Live-stock Commissioner he has succeeded in retaining the good will and respect of stockmen the country over, while serving their interests judiciously at every turn. At conventions his advice has

always been sought and almost invariably followed. As a veterinarian, he ranks among the most eminent in America. He was last year President of the American Veterinary Medical Association and was, if we mistake not, the prime mover in securing the appointment of the International Commission on Tuberculosis, on which he served most effectively."

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WILLIAM OWEN WILLIAMS, F.R.C.V.S.—Our English contemporaries have announced the death of this learned veterinarian. We may be permitted at this late hour to convey this sad news to our confrères of America, to whom the name of Prof. Williams is familiar by his contributions to English veterinary literature; and although the REVIEW has most certainly already addressed her sympathetic condolences to the family of Prof. Williams, I hope this following notice from the *Veterinary News* will convey to our readers the history of the professional life of our regretted colleague:

"Prof. Williams, F.R.C.V.S., F.R.S.E., was born in Bradford, Yorkshire, in 1860, he was the son of the late Prof. William Williams, Principal of the New Veterinary College, Edinburgh. It was at this college that Prof. W. Owen Williams received his first instruction in veterinary science, graduated in April, 1881, and supplemented his instruction at the Alfort Veterinary College, Paris. Returning to Edinburgh, he rejoined the New College, becoming hospital surgeon and demonstrator, then professor of veterinary medicine and surgery as applied to the ox, sheep, pig and dog, and finally principal in 1900. He was president of the Council of the Royal College of Veterinary Surgeons, 1902-4, and president of the National Veterinary Association in 1905-6. In 1904 he accepted the professorship of veterinary medicine and surgery in the University of Liverpool. From 1903, Professor Williams had been veterinary surgeon to the establishment of King Edward's and King George's stables. Prof. Williams was the author of many contributions to veterinary science. He edited a work on the "Principles and Practice of Veterinary Medicine and Surgery," had been editor of *The Veterinary Journal*, and revised Fleming's "Operative

Surgery," Vol. II. During the Boer war Prof. Williams acted as supervisor of horses sent out by the War Office.

"Professor Williams married, in 1885, Annie Christine, daughter of Mr. John Flint, of Glasgow, by whom he had two sons and a daughter. He had been in ill health for some days, and died suddenly, while talking to his son. His age was fifty-one years."

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BIBLIOGRAPHIC NOTES.—Two numbers of the *Archives des Sciences Biologiques de l'Institut Imperial de Medicine Experimentale at St. Petersburg*, have reached me.

In one, No. 3 of Volume 16, there appears: Contribution to the study of the influence of losses of blood upon the digestive process, by N. A. Dobrovolskain; Influence of experimental anemia upon the secretion and composition of bile, by V. G. Korentchevsky; Influences of biliary salts and their combination with enterokinase upon ferments from the pancreas, by the same; and Influence of infection upon the blood, by M. Zenkewitch.

In No. 4 of Volume 16, there is the continuation of Dobrovolskain's article in No. 3; Antirabid vaccination in St. Petersburg, by Dr. W. Kraouchkine; Bacteriological study of the mammoth of Sanga Jourach and of the surrounding soil, by V. L. Omeliansky; the reaction of the fixation of the complement during membranous pneumonia, by A. A. Tchwilina and N. T. Voedenskaia.

The *Agricultural Journal* of the Union of South Africa for June contains three popular articles of veterinary interest: Scab, its nature and treatment, by Mr. A. G. Davison; Actinomycosis, by Walter Jowett, F.R.C.V.S.; Feeding of equines, by J. M. Christy. In the number of July there is one article by R. W. Dixon, M.R.C.V.S., on East Coast fever, prevention and eradication; one by Dr. A. Theiler, C.M.G., on an infectious foot disease in sheep; and one by J. F. Dunning, M.R.C.V.S., on strangles.

The progress in the tuberculosis campaign in Pennsylvania up to 1911, by Lawrence F. Flick, M.D. The McKillip Veterinary College announcement for 1911-1912; and that of the Chicago Veterinary College, same session, are also here acknowledged.

A. L.

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### IMPORTANT EVENTS IN NEIGHBORING STATES.

Two important events have occurred that directly affect the sanitary conditions relative to animal food products in two states which border on either side of the one which is the home of the REVIEW, since we went to press with our last issue. One is the appointment in Connecticut of a veterinarian as "Deputy Commissioner on Domestic Animals," and the other is a movement on the part of veterinarians in several counties in Pennsylvania to co-operate with State Veterinarian Marshall in carrying through his plans in regard to the inspection of the 70,000 herds in the state.

Connecticut has been blessed in having as Commissioner on Domestic Animals for the past twelve years, a man of high principles and one well versed in the conditions and the needs in agriculture in general, and especially of that branch of it which deals directly with the live-stock interests. But it has had its own troubles in getting the proper recognition by the state authorities of the advantages to the commonwealth that would accrue from having a veterinarian directly connected with its sanitary work. Although the Hon. Heman O. Averill, who is the true and tried Commissioner on Domestic Animals of twelve years' standing, has *always* recognized the fact; and has, for the past eleven years, from time to time employed the services of Dr. B. K. Dow, of Willimantic (practitioner, lecturer at the Connecticut Agricultural College at Storrs, Secretary of the State Board of Examiners, and for ten years Secretary of the Connecticut Veterinary Medical Association), as expert, diag-

nostician, consultant, etc.; during which time the commissioner has learned the value of a veterinarian in connection with his work, and has realized how much better work his department could do with a veterinarian regularly connected with it. Therefore, when the legislature of Connecticut gave the Commissioner on Domestic Animals the power to "*appoint or remove at will*" a veterinarian as Deputy Commissioner, he appointed Dr. Dow (for whose opinion he had grown to have much respect) to fill that important position; and we feel sure that we voice the sentiment of the entire veterinary profession when we say that it is the most important step that has yet been taken in the interest of the live-stock industry of the State of Connecticut. Another point equally as important as the ability in the appointee recognized by the commissioner, is the fact that he is popular with the veterinary profession in his state, and will receive the support and co-operation in his work of every reputable veterinarian in Connecticut; which will contribute largely toward the successful performance of his duties as Deputy Commissioner, and materially benefit the cause in which he is working—the live-stock interest of the state.

Of the movement in Pennsylvania too much praise cannot be given. The organization and unity of motive of the veterinarians of that state are the marvel and admiration of all other states. They are always ready at a signal from their leader to line up and meet any emergency. And so, when Dr. C. J. Marshall, State Veterinarian, explained to some of the members of the State Live-Stock Sanitary Board that he was somewhat handicapped in carrying out his plan of inspection of the 70,000 herds in the state, owing to a deficiency in funds with which to pay veterinary inspectors to do the work, and they read disappointment in his countenance, they "got together" to devise some plan by which the work could go forward as planned. And, from the outcome of affairs, it is rather fortunate than otherwise that the State Veterinarian of Pennsylvania is temporarily short of funds; for, as a result of the meetings called in several counties to devise means to carry out the work, at least one, and

perhaps several, new veterinary associations have sprung into existence.

Schuylkill County was the first to organize for the work, then the Bucks County veterinarians came together at Doylestown on October 11, where they had been summoned by Dr. W. H. Ridge, of Trevese, a member of the State Live-Stock Sanitary Board. This conference resulted in the veterinarians of that county agreeing to take up the inspection of dairy conditions at a nominal sum, as they felt the work must go on, now that it had been taken from the State Department of Health and given over to the State Live-Stock Sanitary Board, appropriation or no appropriation; the work must be continued now that it had been begun. And before that conference broke up a new organization had been formed with a complete set of officers elected. Chester County followed suit on October 17 and Delaware County on the 18th; and by the time that this number reaches its readers, the veterinarians of Pennsylvania will be an organized force rallied about the State Veterinarian with a determination to see every dairy in that great state supplying at least cleaner milk, and in many instances clean milk.

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#### INCREASED EFFICIENCY IN THE ARMY VETERINARY SERVICE.

The following clipping from the *Army and Navy Journal* suggests that its author is *subject* to "moments of weakness"; in fact it is difficult to find any evidence of *strength* of character in a man who signs a recommendation one moment and desires to take it back the next; and we believe army veterinarians need have no misgivings on his account:

" COMMISSIONING VETERINARIANS.

" Fort Huachuca, Ariz., Aug. 30, 1911.

" *To the Editor of the Army and Navy Journal:*

" In a moment of weakness I signed a recommendation to commission veterinarians. It was cleverly worded, and increased

efficiency was the keynote of the composition. I do not believe that veterinarians would be any more efficient for commissions. Better give them a good stiff examination every year or two.

“RODMAN BUTLER, 1st Lieut., 6th Cav.”

If the gentleman had given the matter more careful study before signing the recommendation, he would not ask to retract, as he would know that the only way to increase the efficiency of the army veterinary service is to *encourage* those that are already in it and to *attract* veterinarians from the best veterinary schools, into the army. Our veterinary schools are graduating to-day men whose scientific training is equal to that of any medical officer in the army, and the moment they see themselves the medical officers' equal in other respects, the army will have attractions for them, and not until then. This fact, added to the new life and ambition infused into the faithful pioneers of the cause already in the service, by a recognition of their work, would do more, in our opinion, to increase the efficiency of the army veterinary service than anything else; except perhaps *An Army Veterinary Corps*, which we hope to see in the not too distant future.

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DR. WM. ANDERSON'S GOLDEN WEDDING.—In our correspondence department on page 262 of this issue, a report appears from Secretary Dell of the Southern Auxiliary, California State Veterinary Medical Association, to the effect that that organization commemorated, by resolutions, the golden wedding of Dr. and Mrs. Wm. Anderson, of Los Angeles; and states that the association also had the pleasure of entertaining at its banquet Dr. Charles Anderson, of Yonkers, N. Y., who had crossed the continent to be present at the golden wedding of his parents.

We are indeed pleased to publish this good news from the “Golden West” (a most fitting place to celebrate a golden wedding), and know that our readers in the East, especially those in the vicinity of New York City, and many graduates of the

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New York College of Veterinary Surgeons throughout the country, will rejoice to know that our former esteemed associate is so well and so happy, and congratulate him from the bottom of their hearts. It is difficult to conceive of Dr. Wm. Anderson being old enough to celebrate the fiftieth anniversary of his marriage, as when he was with us in New York, not *more* than ten years ago, he was as lively and apparently as young as the rest of us, the majority of whom have not yet celebrated their silver weddings.

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EARNEST EFFORTS REWARDED.—As a result of its earnest efforts to give to the veterinary profession of America the *very best* veterinary journal published in the English language, the REVIEW has *every state in the Union and every Canadian province* represented on its mailing list; and *nearly every* veterinarian in each state and province. We desire to express our appreciation of this loyal support accorded us by the American veterinary profession, which would seem to indicate that we had *succeeded* in our efforts, and feel that we have received our just reward.

NEW YORK-AMERICAN VETERINARY COLLEGE BROADENS ITS CURRICULUM.—Appreciating the steady expansion of the field for veterinarians in live stock centres, the New York-American Veterinary College has recently broadened its curriculum by adding to its already long list of practical veterinarians on its teaching staff, Dr. John F. De Vine, president of the United States Live Stock Sanitary Association, and Consulting Veterinarian to the Department of Agriculture of the state of New York, who will give a *special course* of lectures—two a week during the whole session—on *Obstetrics and Cattle Pathology*. Dr. De Vine's practice is in the heart of one of the richest breeding districts in New York state.

ACCORDING to the last census, the total number of horses and colts in New England and the Middle Atlantic states last year was 1,582,656. Of these 1,502,244 were over a year old and had an average value of \$132.10. The total number of mules of all ages was only 54,096, or 3.4 per cent. of the number of horses and colts.—(*Breeders' Gazette*.)

## ORIGINAL ARTICLES.

### ARSENICAL POISONING FROM SMELTER SMOKE IN THE DEER LODGE VALLEY, MONTANA.

BY D. E. SALMON, D. V. M., MONTEVIDEO, URUGUAY, S. A.

#### IV.

#### THE DIRECT PROOF OF ARSENICAL POISONING (Continued).

In the course of his investigations in the Deer Lodge Valley, the writer made post-mortem examinations of 60 animals, of which 37 were horses and colts, 16 bovine animals, 6 sheep and 1 pig. Forty-three of these were killed for examination and 17 were found dead. The details are given in the following table:

*Table Showing the Number and Kind of Animals Upon Which Autopsies Were Made, and Whether Killed for Examination or found dead.*

| Kind of Animal.       | Killed for        |                | Total. |
|-----------------------|-------------------|----------------|--------|
|                       | examina-<br>tion. | Found<br>Dead. |        |
| Horses and colts..... | 22                | 15             | 37     |
| Bovine animals.....   | 14                | 2              | 16     |
| Sheep.....            | 6                 | 0              | 6      |
| Pig.....              | 1                 | 0              | 1      |
| Total.....            | 43                | 17             | 60     |

These examinations were made on 32 ranches, situated from 1.5 to 13 miles from the smelter, and the results may, therefore,

be accepted as fairly representative of the condition of the livestock in the smoke zone of the valley. The examinations according to months were as follows: February, 24; June, 1; July, 5; August, 11; September, 4; October, 6; November, 5; December, 4; all in the year 1906.

#### THE LESIONS FOUND.

The most frequent lesions found were gastric and intestinal redness, abnormal quantity of liquid in the body cavities, congested kidneys and liver, congestion of the brain or meninges and flabby heart. In 16 cases the stomach showed great redness, in 19 cases the redness was moderate, and in 12 cases slight, a total of 47, or 78.3 per cent. In 18 cases the redness of the intestines was extreme, in 12 moderate, and 17 slight, a total of 47. The distribution of the redness between the stomach and intestines was as follows:

|                               |   |
|-------------------------------|---|
| Slight in both.....           | 5 |
| Moderate in both.....         | 5 |
| Intense in both.....          | 9 |
| Stomach only affected.....    | 9 |
| Intestines only affected..... | 9 |

Either stomach or intestines affected 56, or 93.3 per cent.

Effusions or an increased quantity of liquid in the body cavities was very common. In the cerebral cavity surrounding the brain or within the ventricles a slight effusion was noted in 5 cases, and a greater but still moderate quantity in 13 cases. In a considerable number of cases the brain was not examined.

In the pericardium, the effusion was slight in 12 cases, moderate in 22 and large in 9, being a total of 43, or 71.6 per cent. In the thoracic cavity it was slight in 2 cases, moderate in 3 and great in 2. In the abdominal cavity it was slight in 5, moderate in 12 and great in 4, a total of 21, or 35 per cent. There were effusions, or increase of serous fluid, found in one or more of these cavities in 48 cases, or 80 per cent.

The liver was described as congested in 22 cases, enlarged in 9, pale in 8, soft in 1 and yellowish in 3. The kidneys were congested in 32 cases, pale in 5 and soft in one.

The heart appeared flabby in 23 cases. The brain or meninges were congested in 23 cases. The bladder was inflamed or congested in 24 cases. The respiratory organs showed congestion or hæmorrhages in 19 cases.

Gastro-intestinal redness as a result of arsenical poisoning is well known and is mentioned by all writers on the subject. Effusions in the body cavities are not referred to with the same frequency. Ziegler and Obolonsky<sup>1</sup> explain these effusions, which previously had been mentioned by Pistorius as having been repeatedly observed in the pleura and pericardium, as being the result of disturbances in the circulation and, also, of changes in the vascular walls.

In his evidence submitted to the Royal Arsenical Commission, Dr. Niven<sup>2</sup> said: "The recent cases of arsenical poisoning have certainly been associated with a considerable amount of effusion of liquid in the abdomen, ascites."

Hecktoen and Riesman say:<sup>3</sup> "The brain and cord do not always escape the direct action of arsenic. This is shown both by the symptoms and post-mortem findings. In rare instances cerebral hæmorrhage has been observed; but usually in the most acute cases hyperæmia of the meninges and effusion into the ventricles are the only pathologic changes found in the brain, and these are not constant."

In the horse experimentally poisoned in these investigations (No. 92), a small quantity of effusion was found in the peritoneal cavity and about 8 ounces in the pericardium.

There were, consequently, found lesions which might reasonably be attributed to arsenic affecting not only different organs in the same apparatus, but different systems of organs in the same animal. To be more precise, there were 40 post mortems, or 66.6 per cent., in which the above-mentioned lesions were found affecting the gastro-intestinal tract and the liver or kidneys, and in which there was, also, effusion or increase of liquid

in the serous cavities. There were 17 post mortems, or 28.3 per cent., in which, in addition to the abnormalities just mentioned, there was, also, congestion of the brain or meninges. While in considering the diagnoses we may freely admit that congestion of the stomach and intestines may arise from other irritants than arsenic, and that congestion of the kidneys and liver may arise from other causes, when we find in the same animal (1) congestion of the gastro-intestinal tract, (2) of the liver and kidneys, (3) of the brain or meninges, and (4) effusions in the serous cavities, we must admit that the disease was not an ordinary local one, but was due to a cause which acted on all parts of the body. Now, the only cause of disease which was discovered, either by the experts of the complainant, or of the defendants, in this case, as acting upon such a large proportion of the animals in the Deer Lodge Valley, and which could produce all the abnormalities just mentioned, was arsenic.

The experts for the defense had much to say about the existence of thrombi caused by the presence of the *Sclerostomum equinum* in the anterior mesenteric artery and the effects of such thrombi upon the intestines, liver and kidneys; but the writer is of the opinion that this cause cannot be accepted as accounting for the redness and catarrhal condition of the stomach, the effusions in the pleural cavity, the pericardium and ventricles of the brain, or the congestion of the brain and meninges. It does not account for any of these lesions in horses such as No. 52, already described at length, in which the mesenteric arteries were in perfect condition; nor can it be extended to cover the similar lesions found in the cows and calves that were examined, for the reason that this is not a parasite of bovine animals.

A very interesting case was that of a cow, post mortem No. 30, which died very suddenly July 13, 1906. This animal was milked in the morning of that day, when she appeared perfectly well. In the afternoon she was found in the field dead. The post mortem was made in the forenoon of the following day. There was beginning decomposition, indicated by the odor of the carcass when opened and the distension of the stomachs and

intestines with gas, and for this reason specimens were not taken for microscopic examination.

In the thoracic cavity was found some fresh reddish exudate on the costal pleura; the bronchial mucous membrane was much congested; the pericardium contained from 4 to 6 ounces of bloody serum; the heart was very red, its blood vessels greatly distended and its cavities filled with black clots. The peritoneal cavity contained considerable reddish liquid; the liver weighed  $13\frac{1}{2}$  pounds and about three-fourths of its tissue was light, clay-colored and apparently affected by fatty degeneration or partial necrosis; the spleen was black and soft. The stomach was much reddened and inflamed; the small intestine contained liquid only; the mucous membrane of the anterior portion was covered with a black deposit the nature of which was not determined; the vessels were congested over large areas, and there were some spots of a deeper red indicating inflammation. The large intestine was congested in many places and its mucous surface covered with black pigment. The kidneys were light colored, the apex of the pyramids yellowish owing to distension of the papillary ducts with a light-colored sediment mixed with urine. The bladder contained a small quantity of thick, muddy urine and its mucous membrane was deeply reddened. Examined microscopically, the sediment was found to consist almost entirely of renal epithelium, there being in addition a few leucocytes. The connective tissue about the udder, and especially in front of it, was distended with a straw-colored fluid containing more or less coagulated material.

For the writer, these lesions are such as are often caused by acute arsenical poisoning, but according to the defense they were clearly due to septicæmia hæmorrhagica. In acute arsenical poisoning, as has been observed by the writer in experimental cases, there is generally a very intense congestion of the abdominal vessels, and the liver or spleen may be gorged with blood so that they are black and soft. There may, also, be intestinal hæmorrhage.<sup>4</sup>

Septicæmia hæmorrhagica is a contagious disease, and, while outbreaks may probably appear occasionally from the sudden development of virulent characters by saprophytic microbes, the investigation of any particular case nearly always reveals the existence of previous cases in the same or in neighboring herds, and, with equal frequency, succeeding cases. One of the strong points in the diagnosis of that disease is, therefore, the occurrence of a number of cases within a period of time that would suggest common origin or contagion. On this ranch, no other similar cases occurred before or afterwards.

Another point in the diagnosis is that in septicæmia hæmorrhagica there are either swellings about the head and neck, or the peculiar pneumonia with great distension of the interlobular connective tissue by accumulated lymph. In this case there was neither. The accumulation of lymph in the meshes of the connective tissue about the udder might possibly be looked upon as a form of the external manifestation, but it must certainly be admitted that the localization in this region is a very unusual one in septicæmia hæmorrhagica.

The third character of this disease, which is so conspicuous and constant that it suggested a part of the name—that is, the numerous small hæmorrhages in the connective tissue about the external swellings, and on the serous and mucous membranes, was in this case conspicuous by its absence.

A more plausible theory seemed to the writer to be that the animal had in some way secured an article of food that contained a large quantity of arsenic, and had died from the intense action of this poison upon the brain and nervous system. When questioned as to the possible source of such an unusual quantity of arsenic, the owner said that the only change in conditions to which the cows had been exposed was due to the removal of a stack of hay giving them access to the chaff and dust which was shaken off in handling the hay and which accumulated at the bottom of the stack.

The writer, in investigating the question, was astonished at the large quantity of black dust which would accumulate on a

piece of white oilcloth placed at the foot of a stack and upon which a few forkfuls of hay were thrown. What was the nature of this dust? Was it the black soil of the valley dried and powdered, or was it smoke dust? As an answer to this question, the following analyses by Swain and Harkins<sup>5</sup> are submitted:

*Table Showing Quantity of Arsenic in Hay-Dust as Compared with the Maximum Quantity Found by Analysis of Samples of Hay, 1903 to 1907.*

| Sample.             | Distance from Smelter (Miles). | Parts $\text{As}_2\text{O}_3$ Per Million. |
|---------------------|--------------------------------|--|
| Hay (maximum) ..... | 3.0 E.                         | 107  |
| Hay dust .....      | 4.5 N.E.                       | 967  |
| Hay dust .....      | 4.5 N.E.                       | 987  |
| Hay dust .....      | 1.5 E.                         | 3526                                       |
| Hay dust .....      | 4.0 N.E.                       | 4380                                       |
| Hay dust. ....      | 4.0 N.E.                       | 5140                                       |
| Hay dust .....      | 2.0 S.E.                       | 9190                                       |

This table shows that, whereas the *hay* richest in arsenic contained 107 parts of this poison per million, the *hay dust* richest in arsenic contained 9,190 parts per million, or 86 times as much. These analyses, therefore, furnish a very definite answer to our questions, and show clearly that the hay dust of the Deer Lodge Valley was mostly smoke dust, and that it contained an enormous quantity of arsenic. The sample containing 9,190 parts per million carried 64 grains of arsenic per pound, and it would not be necessary for a cow to eat many pounds of it to obtain a fatal dose.

Fortunately, a sample of this liver was taken for analysis, and was found to contain 63.12 parts of  $\text{As}_2\text{O}_3$  per million, or 0.441 grain per pound. As the whole liver weighed  $13\frac{1}{2}$  pounds, it must have contained approximately 6 grains of arsenic. This was by far the largest proportion of arsenic found in any

liver, being five times the maximum found in the livers of animals experimentally poisoned and which died of acute poisoning. There is, consequently, no reasonable doubt that the cause of death in this case was acute arsenical poisoning.

Another interesting case was revealed by post mortem No. 32, the subject of which was a gray gelding in good condition of flesh and weighing about 1,100 or 1,150 pounds. The owner of this animal lived about two miles southwest of the smelter where the grass was known to be heavily charged with arsenic, and for that reason proper precautions were not taken when allowing the animal to feed upon the luxuriant uncut hay of a neighbor, who had left this hay standing for the very reason that it was considered very badly "smoked." This second ranch was about two miles south of the smelter and the owner of the horse in question had been assisting to haul in the hay crop from other parts of the ranch on August 1st and 2d.

During the dinner hours the horse was allowed to feed upon the uncut hay above mentioned, and the owner was warned that he was taking heavy risks, but, as he did not consider this hay any more dangerous than the grass on his own ranch, he was not influenced by the warnings. However, the luxuriance of the growth and the more palatable nature of the grass probably led to the eating of a much larger quantity. The horse was taken with what the owner designated as "fits" in the afternoon of August 2; he was agitated, trembled violently and would fall down when walking. During the night he was restless and apparently delirious, and in the morning of August 3, fell into a small ditch and died. The autopsy was made within two hours after death.

The points observed which were considered abnormal were as follows: The subcutaneous fat had a gelatinous appearance, as did also that about the heart. There was abundant effusion in both the pleural and peritoneal cavities, and even the pericardium contained from 8 to 10 ounces of liquid. The specific gravity of the pericardial fluid was 1.018; of the peritoneal

effusion, 1,010. There was slight exudate on the pleura, and this membrane was thickened over both lungs and presented a small number of petechiæ. The vessels of the heart were congested.

The stomach was greatly inflamed and the mucous surface of the pyloric portion covered with tenacious mucus. The small intestine was catarrhal and filled with a thick, yellow, gelatinous liquid. The colon showed a number of patches of inflammation and such lesions were numerous in the rectum. The liver was soft and dark colored; the spleen large and soft. The kidneys were large and congested, weighing 3 pounds each; the bladder red and inflamed.

The brain was intensely congested on the surface and in the fissures, and was surrounded by considerable effusion. The spinal cord was congested at several points.

The microscopic examination of the liver and kidneys of this horse revealed changes similar to those which have usually been found by the writer in arsenical poisoning. In the kidneys there was desquamation of the epithelium of the capsule of Bowman; nearly all of the tubules were more or less obstructed with desquamated epithelial cells and coaguli, and there was proliferation of the endothelial cells of the arteries. In the liver, some of the portal veins and some of the central veins were greatly distended with blood and had greatly thickened walls. The protoplasm of the cells in a wide zone around many of the central veins, and especially around those with thickened walls, was lacking in substance and contained many vacuoles, perhaps the result of fat formation. Some of these central veins contained a number of desquamated liver cells, and the cells in some areas were disarranged so that the trabeculæ were completely broken up. There was, also, a considerable increase of interlobular connective tissue.

The chemical analysis of the liver, made by Professor Harkins, gave 3.9 parts of arsenic ( $\text{As}_2\text{O}_3$ ) per million, which, while less than was found in many of the Deer Lodge Valley livers.

was more than was recovered from the liver of one of the horses experimentally poisoned.

The lawyer for the defense, after conferring with one of his veterinary experts, announced that this horse had died of cerebro-spinal meningitis, and that the witness knew it. This affirmation, although it was intended to discredit the witness, may be admitted as having some foundation. The horse did have the symptoms and the lesions of acute cerebro-spinal meningitis, but they were complicated with those of gastro-enteritis and nephritis. In the opinion of the writer, it was an arsenical cerebro-spinal meningitis, and not the ordinary form produced by micrococci, nor, yet, the form supposed to be caused by cryptogamic poisoning. This conclusion seems to be warranted from:

1. The quantity of arsenic found in the liver.
2. The presence of a considerable quantity of liquid of a low specific gravity in the peritoneal cavity and in the pericardium.
3. The coincidence of cerebro-spinal and gastro-intestinal inflammation, together with lesions of the kidneys and bladder such as are found in arsenical poisoning.
4. The sudden appearance and rapid course of the disease.

That this animal had been suffering from chronic poisoning for some time is indicated by the increase of the interlobular connective tissue of the liver, and by the thickening of the vascular walls; and this, no doubt, greatly aided the development of the acute poisoning when somewhat more than the accustomed dose of arsenic was ingested.

It is now convenient to give some account of the studies that were made to determine the effect of feeding the grass that was growing on the ranch of the owner of this horse, whose name was John Malinak. This was a man who had come from the North of Europe and had saved enough from his wages as a laborer in the smelter to buy a small ranch. From this ranch he was trying, with most discouraging results, to obtain a living

for himself and family. His losses of stock as given by himself were as follows:

| Year.      | Horses. | Cows. |
|------------|---------|-------|
| 1904 ..... | 4       | 1     |
| 1905 ..... | 5       | 1     |
| 1906 ..... | 6       | 1     |
| Total..... | 15      | 3     |

At the time this information was obtained, August 13, 1906, the only equine stock left on the ranch was a riding pony.

In order to further test the poisonous effects of the grass on the Malinak ranch, the Farmers' Association selected a cow and a yearling heifer in good condition and sent them there to be pastured, early in August, 1906. These animals ran in a field together until October 9, or about two months, and were then killed for examination.

The cow had steadily lost flesh and had become quite emaciated, although there was much grass still remaining in the field. The animal was sacrificed for examination October 9, and the autopsy (No. 48 of the record) showed the fat of a deep yellow color, indicating disturbance of the functions of the liver. There was considerable effusion in the pleural cavity and 6 to 8 ounces in the pericardium.

The serous surface of the lungs was covered with fine points of black pigmentation, the mucous membrane of the trachea was congested, and there were small areas of broncho-pneumonia in the anterior and inferior portions of the left lung. The median lobe of the right lung was also affected with broncho-pneumonia, the red color contrasting with the whitish, distended air spaces which could be seen through the pleura. The bronchial glands were enlarged but showed no other evidence of tuberculous infection. The heart was flabby.

The mucous membrane of the fourth stomach was very red and catarrhal, and the small intestine showed patches of congestion. The kidneys were a dark greenish brown in the cortical portion and very red in the medullary portion. The bladder was, also, congested but only to a slight degree. There was a small abscess containing 2 to 3 ounces of pus in the right sublumbar region, just anterior to the kidney, and a second small abscess in the inferior border of the liver. The brain was pale with a macerated appearance and there were about 2 ounces of liquid in the cranial cavity.

The microscopic examination of the kidneys showed great flattening and destruction of the epithelium of the tubules; many tubules greatly dilated, and many others obstructed with coagulated material and partly disintegrated cells. In some of the Malpighian bodies there was thickening of Bowman's capsule, and in some there was more or less coagulated material between the capsule and the glomerulus. There was endarteritis and many areas of intertubular connective-tissue proliferation.

In the liver, the veins were distended and the columns of cells badly broken up. There was some increase of the interlobular connective tissue. In a narrow zone around some of the dilated central veins the cells have taken a deeper eosine coloration and the nuclei are very indistinct or invisible. Around other veins this color may also be seen, but the nuclei are still distinct. In other areas the protoplasm of the cells lacks substance and contains vacuoles, indicating fatty degeneration.

Analysis of the liver revealed 10.4 parts of arsenic trioxide per million.

The yearling was also sacrificed and examined on the same day. It had lost flesh while in this pasture and was quite thin, though it could not be described as emaciated.

The autopsy (No. 49) showed a flabby heart, surrounded by about two ounces of fluid. The trachea was somewhat congested. The true stomach was very red and the small intestine considerably congested. The liver was friable and the color inclined to yellowish. The membranes of the brain were con-

gested and there were about two ounces of liquid in the cranial cavity.

The microscopic examination showed in the liver congestion of the portal vessels and central veins; disarrangement of the cells, and a more or less generalized degeneration of the protoplasm as shown by light, colored areas and indistinct vacuoles, readily seen but not quite as well defined as in the typical fatty degeneration, which also existed in a wide zone around the distended central veins.

In the kidneys there was advanced degeneration and disintegration of the epithelial cells, especially of the convoluted tubes. Many tubes were filled with coagulated material and with masses of desquamated and partly disintegrated epithelium. There was some desquamation of the epithelium of Bowman's capsules, and, in some cases, coagulated material between the glomerulus and the capsule. There was endarteritis and areas of intertubular connective-tissue proliferation.

The liver of this calf carried 16.1 parts of arsenic trioxid per million.

These two animals were undoubtedly suffering from chronic arsenical intoxication as shown by:

The loss of condition in both animals; the congestion of the trachea in both animals; the bronchio-pneumonia in the cow; the congestion of the stomach and intestines in both animals; the cerebral congestion in the calf; the changes in the kidneys and liver seen on microscopic examination and the large quantity of arsenic existing in the livers of both animals. In that of the calf, there was found about 25 per cent. more arsenic than the maximum found by Harkins and Swain in the livers of animals which they experimentally poisoned and which died of such poisoning.

The last case to which allusion will be made in this article was a horse (No. 91 of these notes) on which an autopsy was made by the experts of the smelter company before the viscera were seen by the writer. Owing to information that this animal

had not been eating for a considerable time, was very weak and liable to die at any moment, a visit was made to the ranch September 6, 1906. On arrival, it was found that the company's experts had been there a short time before, had killed and posted the animal, but as less than an hour had elapsed the viscera were still in good condition for examination.

The trachea, which had not been opened, was found considerably congested; the lungs were also congested with areas of hypostatic pneumonia and emphysema on the lower border. The stomach had been carried away; the small intestine was catarrhal with reddened patches, the colon was greatly reddened in parts, and the rectum, which had not been opened, showed similar hyperæmic areas. When a section was made through the kidneys, the Malpighian bodies stood out as prominent blood-red spots on the cortical substance; the bladder was much congested. The liver appeared greatly congested.

Microscopic examination of the liver tissue showed in a large proportion of the lobules areas in which the cells were more deeply stained with eosine and in which the nuclei had disappeared, indicating multiple necrosis. There were many free nuclei and chromatin granules. In many areas the regular arrangement of the cells was broken up and the protoplasm had a foamy appearance. Some of the central veins were much distended and the walls inflamed and thickened. There had also been some proliferation of the interlobular connective tissue.

This liver resembled very closely in its lesions that of cow No. 48 (see above), but the lesions were more intense.

In the kidneys, the glomerular vessels were greatly congested and there was thickening and desquamation of Bowman's capsule. There was extensive proliferation of the intertubal connective tissue, and, in parts, degeneration of the tubal epithelium, shown by great flattening in some areas and disintegration and desquamation in others. A great many tubules contain foamy appearing coaguli; others, solid and deeply stained coaguli. There was also endarteritis, as shown by swelling of the nuclei and proliferation of the endothelial cells.

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The chemical analysis of the liver of this horse revealed no more than a trace of arsenic.

This was one of the cases such as are occasionally encountered in arsenical poisoning, with animals as well as with men, in which the arsenic had nearly disappeared from the liver. This was probably due in this case to the fact that the animal had ingested a considerable quantity of arsenic and had then stopped eating, or had, on account of his illness, been fed upon imported, arsenic-free food. The congestion of the trachea, lungs and intestines; the acute glomerulo-nephritis; the desquamation of the tubular epithelium, and the necrosis of the liver cells certainly indicate recent and severe poisoning; while the increase of connective tissue in the kidneys and liver, the flattening of the renal epithelium and the thickening of the walls of the central veins of the hepatic lobules, just as certainly, indicate that a poison had been acting upon these organs for a considerable time. The case was, therefore, one of chronic intoxication ending with acute poisoning.

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  - (4) Peterson and Haines. *Text-Book of Legal Medicine and Toxicology. Philadelphia, 1904, vol. ii., p: 412.*
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THE United States Civil Service Commission announces an examination on November 8, 1911, to secure eligibles from which to make certification to fill vacancies as they may occur in the position of veterinarian in the Quartermaster's Department, unless it shall be decided in the interest of the service to fill such vacancies by reinstatement, transfer, or promotion. The usual entrance salary to this position is \$1,200 per annum. Applicants should at once apply to the United States Civil Service Commission, Washington, D. C.

## THE CONTROL AND ERADICATION OF GLANDERS.\*

BY C. D. MCGILVRAY, M.D.V., WINNIPEG, CANADA.

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In dealing with this subject and presenting it for consideration, it is my intention to place before you certain features which have impressed themselves upon me, during the past seven years, while actively engaged in dealing with the control and eradication of glanders, through the use of mallein, among horses in the province of Manitoba.

While glanders has been considered, both by the veterinary profession and intelligent horsemen, as a disease which, on account of its nature, should be controlled and eradicated, still the "*bête noire*" has apparently been as to what measures should be adopted and followed as a means of effecting this end with the least material sacrifice.

The various policies propounded and methods adopted have shown a wide divergence, and the greater the magnitude, or scope, of the field under observation, the less tenable have many of them appeared.

Without entering into any apparent reiteration or descanting upon these, it would appear that the most common procedure in dealing with outbreaks of glanders had been directed towards animals showing plainly discernible clinical symptoms, such animals being destroyed, while other contact horses, if not manifesting clinical evidences of the disease, were often disregarded, or, at best, placed under quarantine restrictions as appeared exigent for a short time, at the end of which, if they did not manifest clinical symptoms of the disease, restrictions and observations usually terminated. It was not sufficiently realized

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\* Presented at the forty-eighth annual meeting of the American Veterinary Medical Association, Toronto, Can., August, 1911.

that horses could be affected with occult, or concealed, glanders, remaining in this latent condition even for several years and, while nevertheless diseased, might, to all outward appearances, be healthy? Therefore quarantining of itself, to be of any avail as to determining even possible freedom from the disease, would require to be for a much more extended period than was usually imposed.

Again, when the necessary steps were taken to ascertain the actual condition as to health of contact animals by the use of mallein, and where such animals reacted to the test, slaughter was not, in many cases, enforced, nor, on the other hand, were definite restrictions or limitations placed upon them.

This was the state of conditions which existed in the province of Manitoba prior to the year 1905, and, as a result, glanders had become widely distributed throughout the province, with a marked increase in prevalency.

Through the efforts of Dr. J. G. Rutherford, C.M.G., Veterinary Director General for the Dominion of Canada, Manitoba was, during February, 1905, brought under Federal control and placed under the operations of the Contagious Diseases of Animals Act. This responsibility having been assumed by Dr. Rutherford, the policy embodied in the regulations relating to glanders drafted by him was put into practical operation and consistently carried out as a means, if possible, of effectively dealing with and eradicating glanders from the province, the field work in connection with which I took charge of, under his directions, during February of the year 1905.

This policy, in brief, was that all animals affected, or suspected of being affected with glanders, should be inspected and submitted to the mallein test, and all which definitely reacted forthwith slaughtered, compensation being paid to owners as provided for by the Contagious Diseases of Animals Act at the rate of two-thirds the animal's value, with a maximum valuation of \$150 per head for grade animals and \$300 for pure breds. Any animals giving doubtful or unsatisfactory results at the time of first test were not slaughtered but kept under

close quarantine restrictions and again submitted to the mallein test at the expiration of fifteen days from the time of the first test. If, upon retest, they proved negative, they were released, while, on the other hand, if they reacted they were forthwith slaughtered and the owners compensated, as provided for.

In actual outbreaks of the disease, when any of the animals under control were clinically affected, these, together with any other horses on the premises, were tested. All reactors were promptly destroyed and the owners ordered and instructed as to the satisfactory cleansing and disinfection of the premises by means of limewash and carbolic acid, together with the disinfection of all other articles and utensils which might have been in use, to the satisfaction of an inspector. The animals which were negative to the first test were placed under quarantine restrictions for a further test before being released. This retest was conducted at the end of fifteen days from the time of first test, and if they again proved negative to the test they were released, while, if any of them reacted, they were destroyed and the premises again cleansed and disinfected.

With the view of tracing the source of infection in outbreaks, owners were closely questioned as to the history of the various horses on their premises. Further searching inquiry was also made as to any possible contact, directly or indirectly, of other horses with the diseased animals, either adjacent or remotely situated. Upon receiving this information, which was carefully noted, steps were taken to trace up, locate and deal with all horses and premises to which suspicion was thus attached, and such suspects were then submitted to the mallein test.

While this, as you will see, involved a considerable amount of labor and detail work, still it has shown itself to be an essential factor in the control and eradication of glanders.

The results of our work have shown us that in the control of glanders efforts must largely be directed towards restricting all traffic and migrations of reactors and contact infected animals. Almost invariably where outbreaks of glanders have been found in what has hitherto been a healthy stud, such outbreaks

have originated from and been caused by the introduction on to the premises of occult affected animals, which, at the time, were not showing any discernible clinical symptoms, but were to all outward appearances healthy.

The view has been somewhat prevalent that a horse affected with glanders may only be capable of transmitting infection when clinically affected, either with a visible nasal discharge, or farcy buds. Such, however, is erroneous. While, no doubt, clinically affected animals, especially those having a profuse nasal discharge, are more highly dangerous and infective than occult cases, nevertheless it must not be overlooked that many of the latter are affected with concealed lesions as of the nasal passages, larynx, trachea or lungs, and in the case of the latter (concealed pulmonary glanders) the lesions may involve considerable areas having suppurating foci discharging bacilli which are in turn expelled by normal expiratory movements. Again, sooner or later, many of these become clinical. Thus all doubt should be removed as to the dangerous nature and infectiveness of a very large number of these occult cases.

In the clinical examination of horses for glanders, the condition of the submaxillary glands should always be carefully examined and an indurative, bosselated condition of these glands, even in the absence of any visible nasal discharge or ulceration, must be regarded with suspicion. The absence of a visible ulceration of the nasal mucosae does not by any means exclude the possibility of glanders being present, as even in clinical cases a visible ulceration on the septum, or under the alae, is not always present, ulceration being more often situated higher up and therefore invisible.

Before proceeding to consider the use of mallein and other features in connection with the testing of horses, it would seem proper to furnish reliable statistical information regarding glanders in Manitoba:

During the years 1901 to 1904 only clinical cases were destroyed. No official records available of number tested.

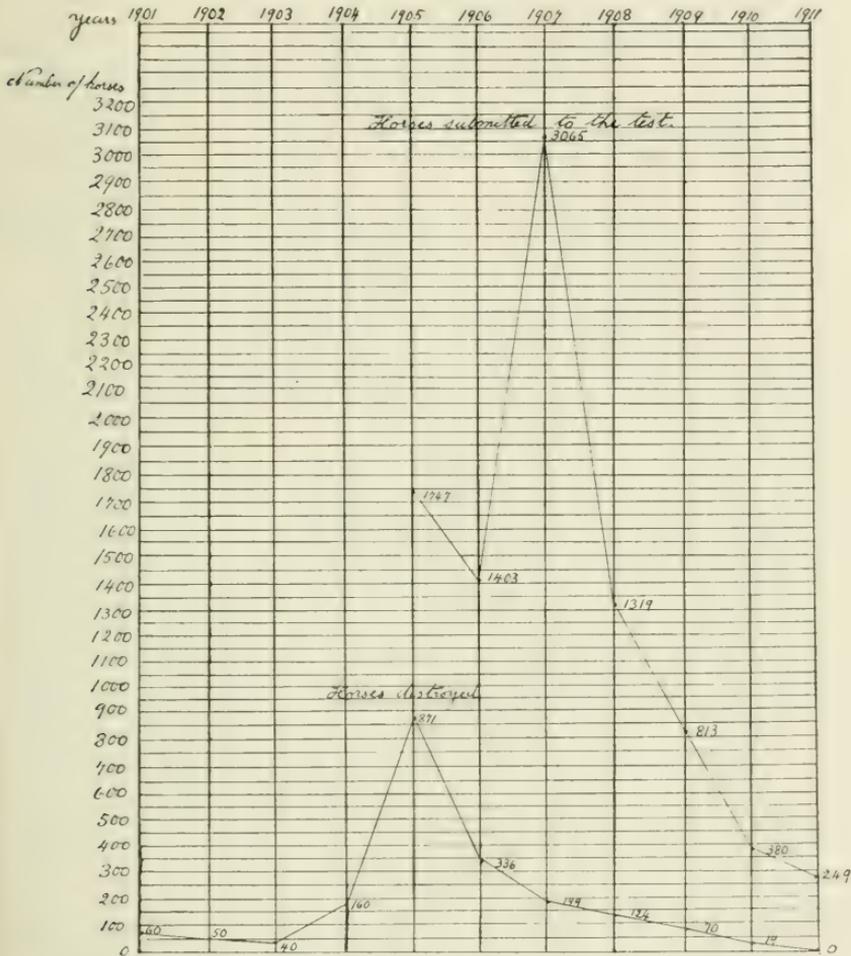


CHART SHOWING NUMBER OF HORSES TESTED WITH MALLEIN AND NUMBER DESTROYED FOR GLANDERS IN MANITOBA FOR A PERIOD OF TEN YEARS.

Each space on chart represents fifty horses.

In 1905, of 1,747 horses tested, 871 were destroyed, 365 being clinical cases.

In 1906, of 1,403 horses tested, 336 were destroyed, 173 being clinical cases.

In 1907, of 3,065 horses tested, 199 were destroyed, 99 being clinical cases.

In 1908, of 1,319 horses tested, 124 were destroyed, 53 being clinical cases.

In 1909, of 813 horses tested, 70 were destroyed, 29 being clinical cases.

In 1910, of 380 horses tested, 19 were destroyed, 9 being clinical cases.

In 1911, 249 horses have been tested, and up to the present time (August 19) no cases of glanders have been discovered.

In addition to the above, during the above-mentioned period, extending from 1905 to 1911, we have submitted to the test 14,850 horses and mules entering at boundary points in Manitoba from the United States.

In connection with the foregoing statistics it will be observed that, under the method followed preceding 1905, when only clinical cases were destroyed, the disease was on the increase.

Under the policy which was introduced and put into operation in 1905, attention was immediately directed towards all premises upon which cases of glanders had been destroyed or reported during the preceding year. Curious as it may seem, almost invariably, among the contacts of cases previously dealt with, it was found that a very large number of these contacts had, in the meantime, developed clinically, hence the work during this year consisted largely in tracing up and dealing with the contacts of previous outbreaks.

During the year 1906, while the number of horses tested was slightly less than the preceding year, the number found to be diseased was less than one-half.

During 1907, horse owners and practicing veterinarians, now being entirely in sympathy with and having confidence in the work being done, began to report freely any cases to which suspicion might be attached as shown by the consequent increase in the number of horses inspected and tested; yet, while the number of horses inspected and tested was considerably increased, the number found to be affected was very greatly diminished.

The same policy was consistently followed during the succeeding years with a more pronounced decrease each year in

the number of animals found to be affected and destroyed, until, during this year, up to the present time (August 19, 1911), no cases of glanders have been detected.

In the carrying out of this work, as a result of careful observations, certain conclusions have impressed themselves upon us regarding the use and value of mallein which would seem to be worthy of consideration.

### THE USE AND VALUE OF MALLEIN.

In testing the clinically affected horses, they invariably, with the exception of a few cases which prior to injection had high temperatures exceeding  $102^{\circ}$  F., gave positive results, and showed well-marked thermal reactions, exceeding  $2.5^{\circ}$  over the highest pre-injection temperature, accompanied by typical infiltration at seat of inoculation, and associated in most cases with constitutional disturbances as manifested by increased respirations and inappetance.

The cases having high initial temperatures (autogenetic) in the absence of a further thermal increase after injection, however, gave characteristic local reactions, associated with more or less constitutional disturbance.

Mallein, therefore, in our hands, demonstrated an unmistakable affinity for clinical cases of glanders. Such being the case, no reason can appear to exist why this selective affinity should not be maintained when applied to occult cases.

The common acceptance of a reaction has been given as an increase in temperature of 2 degrees over the average pre-injection temperature, associated with local and organic reactions. This, after all, to those who have given the matter serious consideration, is somewhat indefinite, if not misleading. A very important feature has apparently been overlooked in not keeping in view the fact that normal temperature is not a fixed quantity, but varies in individuals according to environment, location, seasons, etc. Throughout many districts of Western Canada, the normal temperature of horses presents a wide range, varying

from  $99^{\circ}$  to  $102^{\circ}$  F. During the greater part of the year the average normal temperature has been found to be about  $101^{\circ}$  F., just as many being found with temperatures over that mark as with temperatures below.

If any hard and fast rule was applied of an increase of  $2^{\circ}$  constituting a reaction, the individual with a temperature of  $99^{\circ}$  to-day would, to-morrow, as a result of mallein injection, if the temperature reached  $101.5^{\circ}$ , be classed as a reactor. Nevertheless the temperature may even then be within a normal range. Again, horses frequently have temperatures of  $99^{\circ}$ , and upon the succeeding day, without any injection of mallein, may present a temperature of  $101^{\circ}$  to  $102^{\circ}$ , maintained during the entire day.

I am somewhat inclined to think that this is a pitfall into which many have fallen, and may to some extent explain why they have encountered so many reactors which have never developed clinical symptoms and which upon retest, fail to manifest any reaction and have been wrongly classed as "ceased reactors." In reality many such animals never reacted to the test, as their temperatures after injection were still within a normal range, and while possibly not altogether satisfactory, were not, in the true sense, reactors. It would seem, therefore, that in the intelligent application and use of mallein it is not only essential to determine the single individual's apparent normal temperature, but also to determine the normal range of temperature for horses in the area under observation.

It is usually accepted and acknowledged by those engaged in dealing intelligently with mallein in the control of glanders that animals which have shown a slight or doubtful reaction to a first mallein test, may subsequently either fail to react or to do so but slightly, or, on the other hand, may even show a pronounced reaction without in the meantime developing any external manifestations of disease. This fact has apparently given rise to a considerable amount of controversial comment. Close observations have led me to conclude that the animals which entirely fail or cease to react are usually those which have not

given a characteristic reaction to a first test. Those which have shown a positively characteristic reaction to a first test seldom fail to react more or less to a second test, but may fail to react definitely to some subsequent test which may result, in some animals, from an acquired tolerance to mallein induced in them by repeated injections.

It is advisable, I think, to consider ceased reactors, so-called, as a class comprising at least two distinct sub-classes, viz.:

A—Pseudo ceased reactors.

B—Authentic or actual ceased reactors.

*Pseudo Ceased Reactors.*—Under this heading may be considered all animals which have given a doubtful or non-characteristic reaction to a first test, but which fail or cease to react to subsequent tests. In the control work of glanders on a large scale, there will necessarily be found a large number of animals which, for some reason or other, may give doubtful results to a first test and which, upon retest, may prove entirely negative. In the true sense these are not ceased reactors as, in the first place, they had not given a characteristic or positive reaction and, upon proving negative to a second test, may as a general rule be considered innocent. This class has, to my mind, been largely drawn upon by those tending to disparage the value of mallein.

*Authentic, or Actual, Ceased Reactors.*—In the true sense of the term, a ceased reactor is an animal which has given a characteristic or positive reaction to the test, but which has proved entirely negative, or failed to react, even atypically, to subsequent tests. This class I do not consider to be at all as numerous as is alleged by some, being of the opinion that included in this class by them are many which should rather be classed otherwise.

In the case of authentic, or actual, ceased reactors, whether from an acquired tolerance as a result of repeated malleinization or a supposed recovery, I consider them as a dangerous class to which suspicion must be attached, from the fact that out of

their numbers arise individuals responsible for fresh outbreaks, many instances of which could be cited in substantiation thereof.

A very interesting feature which has been observed in connection with many of these so-called ceased reactors which have been kept under official supervision is, that having reacted more or less definitely to first and second test, they may subsequently fail to react to third, fourth and further tests if made within intervals of thirty, sixty and ninety days, but if allowed to remain without being subjected to mallein for a period of twelve months or more, they then, when tested again, show a pronounced reaction.

In illustration, I append herewith records dealing with the case of one of these ceased reactors:

\* During July, 1908, an outbreak of glanders was detected and dealt with by officers of the Department at High River, Alta. Thirteen horses on the premises were inspected and tested, eight of which reacted and were destroyed. Of the other five, four were entirely negative, while one, a black stallion named "Fritz." reacted, but on account of especial value to the owner, at his request was held for further test.

#### RECORD OF TESTS OF BLACK STALLION "FRITZ."

| <i>First Test.</i>  |                  |                       |                  |                  |         |
|---|------------------|-----------------------|------------------|------------------|---------|
| Temp. Before Injection  |                  | Temp. After Injection |                  |                  |         |
| July 13, 1908.  |                  | July 14, 1908.        |                  |                  |         |
| 3 p. m.   | 7 p. m.          | 7 a. m.               | 10 a. m.         | 1 p. m.          | 4 p. m. |
| 100 <sup>4</sup>  | 100 <sup>1</sup> | 103                   | 103 <sup>2</sup> | 102 <sup>4</sup> | 102     |
| Maximum swelling, 3 in. x 4 in. No clinical symptoms present. |                  |                       |                  |                  |         |

| <i>Second Test.</i>  |                  |                       |                  |                  |         |
|--|------------------|-----------------------|------------------|------------------|---------|
| Temp. Before Injection   |                  | Temp. After Injection |                  |                  |         |
| August 22, 1908.   |                  | August 23, 1908.      |                  |                  |         |
| 6.30 p. m.   | 9.30 p. m.       | 8 a. m.               | 10.30 a. m.      | 2 p. m.          | 5 p. m. |
| 100  | 100 <sup>4</sup> | 105 <sup>2</sup>      | 105 <sup>2</sup> | 103 <sup>4</sup> | 104     |
| No clinical symptoms present and owner still refused to have animal destroyed. |                  |                       |                  |                  |         |

\* I am indebted to Dr. Rutherford for placing the official records dealing with this case at my disposal.

During December, 1908, the owner had the horse tested privately. No official record of test results, which were supposed to be negative.

*Fourth Test (Third Official Test).*

| Temp. Before Injection          |         |  | Temp. After Injection |                  |         |                  |            |
|---------------------------------|---------|--|-----------------------|------------------|---------|------------------|------------|
| January 13, 1909.               |         |  | January 14, 1909.     |                  |         |                  |            |
| 2 p. m.                         | 9 p. m. |  | 7.30 a. m.            | 10 a. m.         | 1 p. m. | 3.30 p. m.       | 7.30 p. m. |
| 100                             | 100     |  | 100 <sup>2</sup>      | 100 <sup>2</sup> | 102     | 101 <sup>2</sup> | 101        |
| Maximum swelling, 2 in. x 2 in. |         |  |                       |                  |         |                  |            |

*Fifth Test.*

| Temp. Before Injection           |                  |  | Temp. After Injection |                  |                  |                  |            |
|----------------------------------|------------------|--|-----------------------|------------------|------------------|------------------|------------|
| January 24, 1910.                |                  |  | January 25, 1910.     |                  |                  |                  |            |
| 6 p. m.                          | 9 p. m.          |  | 5.30 a. m.            | 8.30 a. m.       | 11.30 a. m.      | 2.30 p. m.       | 5.30 p. m. |
| 99 <sup>2</sup>                  | 100 <sup>1</sup> |  | 100 <sup>2</sup>      | 100 <sup>2</sup> | 101 <sup>1</sup> | 100 <sup>4</sup> | 100        |
| Maximum swelling, 3½ in. x 4 in. |                  |  |                       |                  |                  |                  |            |

During June, 1910, arrangements were made by which this horse was procured from the owner and removed to the Quarantine Station at Lethbridge, where it was kept isolated under the supervision of Dr. A. Watson, one of the pathologists of the Department. It was allowed to remain without being subjected to mallein for a period of about seventeen months and was then submitted to the test on June 6 and 7, 1911, by Dr. Watson in the presence of Drs. Hilton and Hargrave, also officials of the Department. The results of the test are as follows:

| Temp. Before Injection          |                 |          | Temp. After Injection |                  |                  |                  |                  |
|---------------------------------|-----------------|----------|-----------------------|------------------|------------------|------------------|------------------|
| June 6, 1911.                   |                 |          | June 7, 1911.         |                  |                  |                  |                  |
| 7 a. m.                         | 12 a. m.        | 10 p. m. | 8 a. m.               | 10 a. m.         | 1 p. m.          | 4 p. m.          | 10 p. m.         |
| 100                             | 99 <sup>5</sup> | 101      | 102                   | 103 <sup>2</sup> | 103 <sup>2</sup> | 103 <sup>4</sup> | 101 <sup>4</sup> |
| Maximum swelling, 7 in. x 7 in. |                 |          |                       |                  |                  |                  |                  |

After injection there was present a slight lachrymal discharge and tenderness of submaxillary glands, also slight œdema under the abdomen anterior to the sheath.

On July 13 this horse was destroyed at the Quarantine Station and a careful post-mortem examination was made by the pathologist, Dr. Watson, in the presence of Drs. Hilton, Hargrave and Gallivan, veterinary inspectors of the Department.

No clinical symptoms were in evidence and the horse was in fair condition prior to slaughter.

*Post Mortem*—Careful examination of the submaxillary lymph glands and of the mucosae lining the nasal passages, fauces, pharynx, larynx and trachea revealed no lesions. The cervical lymph glands, some appeared hæmorrhagic; others showed slight pigmentation and slight calcified deposits. Bronchial glands apparently normal. Lungs—on the surface of the left foot a typical glanders nodule was observed and many small, hard bodies could be felt embedded in the parenchyma, which, upon section, were found to be calcified glanders nodules, varying in size from a pinhead to small peas. Of the mediastinal glands, the anterior ones showed calcified deposits. Spleen appeared normal. In the liver numerous typical lesions of glanders were in evidence, many calcareous nodules being situated under the capsule; one nodule of large size was encysted with a cavity containing pus; groups of encapsulated nodules with softening centres were embedded throughout the liver substance.

In determining a thermal reaction, I consider that where the temperature recorded at intervals of two hours from the eighth to the twentieth hour after injection does not reach and exceed  $2.5^{\circ}$  over the highest initial temperature within a normal range, and is unaccompanied by a definite typical reactionary swelling at seat of inoculation or marked constitutional disturbance, more especially where the acme has been reached before the twelfth hour after injection and begins thereafter to recede to the normal range, it is not a characteristic reaction from glanders infection. When the same degree of thermal reaction is obtained, accompanied by a definite local infiltration at seat of injection, and pronounced constitutional disturbance, it indicates a glanders infection.

When the thermal reaction reaches and exceeds  $2.5^{\circ}$  with the rise of temperature maintained from eight to twenty hours after injection, presenting the highest peak from the twelfth to the eighteenth hour, associated with a reactionary infiltration

at seat of injection, even in the absence of any marked constitutional or organic disturbance, it indicates a glanders infection.

In judging a typical local reactionary swelling, observations lead me to conclude that it depends not so much on the actual size as measured across its surface as on its nature as to shape, size, tenseness and presence of pain. The typical reactionary infiltration is nearly circular in outline, has a tendency to increase the area from the eighth hour after injection, and at the same time extends to and involves the deeper seated, underlying muscular tissues, giving rise to an acute myositis over which the skin becomes adherent. To the touch it is tense, hot and extremely painful, and if the neck has been the seat of injection, cord-like swellings (lymphatic) in some cases may extend to the shoulder, causing pain and difficulty of shoulder movement. When the infiltration assumes such a nature, I consider it a typical reactionary swelling irrespective of its surface measurement.

When an infiltration is not typical, it rarely exceeds a diameter of three inches and to the touch is found to be slightly painful, soft and movable, remaining superficial in the skin and subcutis, not extending to or involving the underlying muscular tissues, nor perceptibly increasing in area after the eighteenth hour, and has a tendency to become absorbed and gradually disappear thereafter. It does not extend towards the shoulder joint nor cause stiffness of movement.

Oblong infiltrations should be carefully observed, as even when of large size they are frequently not typical, being a dependent œdema, usually resulting from the manner in which the injection has been made, causing an oblong fold to become inflated.

These oblong, œdematous infiltrations should be differentiated from the cord-like swellings extending from a typical, circular, reactionary infiltration, as they tend to become more rapidly absorbed, do not present any of the other features such as extreme painfulness, are soft and movable, and do not extend to the deeper seated muscular tissues nor cause stiffness of shoul-

der movement as is characteristic of the typical reactionary infiltrations.

In retesting horses which have given a more or less definite reaction to a first test, my experience has been that the local reaction at second test may be less pronounced and temperature acme more variable and, while in a few cases the temperature acme has been observed from about the eighth hour after injection, more frequently it remained in abeyance until at and following the fourteenth hour.

In actual outbreaks where any of the animals under control are showing unmistakable clinical symptoms, all contacts should be regarded as possibly infected. Those giving a definite and characteristic reaction to the test, clinical or otherwise, should be considered as diseased and dealt with accordingly. Those in which the result of the test is negative or non-characteristic should be held under proper restrictions for a further test within a reasonable time. This has been found quite satisfactory by us when conducted at the end of fifteen days. If at this time they prove entirely negative to the test, they may safely be considered as non-infected. While, on the other hand, if any react, they should be considered as diseased and dealt with accordingly.

Any contact animals having temperatures over the normal range unless some other well-defined cause is in evidence to satisfactorily account for same, if upon testing, even in the absence of a further thermal increase, or a sudden drop or decline in temperature, they exhibit a typical local infiltration at seat of injection, accompanied by constitutional disturbance, should be considered as incubatively affected.

The course, as outlined above, having been pursued and consistently carried out in our operations, has been fruitful in preventing secondary outbreaks, none of which have been encountered by us during the period under observation.

Disparagement as to the value of mallein has been made by some, who claim that animals suffering from certain febrile affections and conditions other than glanders may react. This, needless to state, is a wrong application. In the first place, in

such cases the test should be deferred and not applied until animals are in a normal state, as even in the natural course of any febrile affection an increase in temperature might be encountered without the application of mallein, and which, under mallein inoculation, may be wrongly ascribed to the injection. In the course of our work very many horses suffering from non-febrile maladies have been submitted to the test and characteristic reactions have not been obtained if they had not previously been in contact with glandered horses. Likewise in the case of febrile affections, without any previous contact with glanders, characteristic reactions were not obtained. Horses should be tested under natural and normal conditions and fed and watered as customary. Temperatures, however, should preferably not be recorded immediately after watering. Physiological increases in temperature may be induced in horses undergoing test during extremely sultry weather, if closely confined in ill-ventilated stables. During extremely cold weather they should be protected from undue drafts and chills and the body clothed if necessary. Exercise to any great extent should be withheld until the required period for recording temperatures has elapsed, as any violent exercise very often perceptibly increases the temperature range. Fractious animals should also be properly restrained and controlled so that the temperatures can be taken without undue excitability or resistance.

During the first two years of our work much evidence accumulated from time to time as to infection being introduced by horses coming from other countries, so that during the early part of the year 1907, in order to lessen and prevent the possibility of fresh infection being introduced into Canada, the Veterinary Director-General deemed it advisable to take measures guarding against such contingencies, as a result of which the quarantine regulations were amended to conform to the general intents of his glanders policy. In the case of animals entering from the United States, it was required that all horses, mules and asses must either be accompanied by satisfactory certificate of mallein test, signed or endorsed by a duly authorized inspector

of the Bureau of Animal Industry of the United States Department of Agriculture, dated not more than thirty days prior to the time and date of entry, or if not so accompanied, such animals would be submitted to the mallein test by duly authorized inspectors of the Health of Animals' Branch of the Department of Agriculture of Canada. At the same time the importation of unbroken, branded or range horses, mules and asses was prohibited and, in compliance with the foregoing regulations, in addition to the number of horses mentioned as tested in field work, we have, as already stated, tested at boundary points in Manitoba 14,850 horses and mules coming from the United States.

In conclusion I would state that in connection with the control of glanders in the Province of Manitoba, while the number of animals which it was found necessary to slaughter during the first few years of the work was comparatively large, the decrease became rapidly pronounced and maintained and the measures taken to prevent infections from outside sources have so far proved satisfactory. It clearly indicates that the policy of eliminating, by the use of mallein, all reactors, both latent as well as clinical cases, when put into practical operation and consistently carried out, has the desired effect of eradicating glanders, and lapse of time will only tend further to show and prove that the policy involves the least material sacrifice.

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DR. H. M. HALVERSON, Yankton, South Dakota, president of South Dakota Veterinary Medical Association, says in renewing his subscription to the REVIEW: "I can't and won't get along without it."

ANNUAL CONVENTION OF NEW YORK STATE DAIRYMEN.—The thirty-fifth annual convention of the New York State Dairymen's Association will be held December 12, 13, 14 and 15, in one of the richest dairying sections of the state, at Olean. This place also has the advantage of good railroad facilities, and long distance trolley lines, running in from all directions. A large attendance is therefore predicted.

## AN UNDESCRIBED PATHOGENIC BACTERIUM IN MILK.\*

By E. C. SCHROEDER, M.D.V., and W. E. COTTON, D.V.M., Bureau of Animal Industry Experiment Station at Bethesda, Md.

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Several years ago, at the Experiment Station of the Federal Bureau of Animal Industry at Bethesda, Md., we made a series of tests relative to the occurrence of virulent tubercle bacilli in ordinary city milk, with special reference to their intermittent occurrence in milk vended by dairies from which tuberculous samples had been obtained with previous tests. In the course of these investigations many Guinea pigs were given intra-abdominal injections of milk and afterwards kept alive somewhat longer than is commonly believed to be necessary for well marked lesions of tuberculosis to develop. When the Guinea pigs were eventually killed some of them showed lesions on postmortem examination that could easily be mistaken as tuberculosis, but which our experience with tuberculosis in Guinea pigs helped us to distinguish as probably another disease, especially as careful microscopic examinations failed to reveal acid-fast bacilli, which are, as a rule, abundant and not difficult to find in the tuberculous lesions of Guinea pigs.

We soon discovered the disease to be transmissible through subcutaneous inoculations of affected tissue from Guinea pig to Guinea pig, but our efforts to cultivate a supposedly existing, specific micro-organism, and our attempts to find an organism in the lesions under the microscope, were unsuccessful.

After our interest in the subject had somewhat abated, it was actively restimulated during a study concerning the influence of tuberculin injections on the elimination of tubercle bacilli, with milk and otherwise, from the bodies of tuberculous cattle, by

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

discovering that the milk of a tuberculous cow at the Experiment Station caused the mysterious disease when it was injected into Guinea pigs that were afterwards permitted to live six weeks or longer. We collected milk from this cow repeatedly under the strictest conditions to exclude its infection from any source but the interior of her udder, and this milk proved to be fully as infectious as that collected earlier with less minutely elaborate precaution.

We again tried to isolate a specific micro-organism, and as no growth appeared in the numerous tubes of culture media inoculated with small fragments of tissue from affected Guinea pigs, we assumed that we were dealing with an organism that either could not be cultivated artificially or which would not grow in the culture media we had used; hence, as the disease was particularly severe in its action on the livers of Guinea pigs, we concluded to try a culture medium to which bile had been added.

On agar, containing 6 per cent. of glycerine and from 1 per cent. to 20 per cent. of ox gall, a growth was obtained, which was more vigorous in the tubes to which 5 per cent. or more of gall had been added than in those that contained less. Since obtaining this growth we have succeeded in cultivating the organism, which is a small bacterium, on other media, and have found that on some, on which it did not seem to grow at first, it multiplies quite well when their surface is smeared with pulp from the spleens of healthy Guinea pigs.

We are not yet fully prepared to make a detailed statement about the different substances on which the germ will grow, especially as it multiplies better on several media after it has lived one or more generations under artificial conditions. Its appearance on the surface of glycerine-bile-agar is in the form of small, pearly, slightly convex, pale gray colonies. The water of condensation in slanted tubes remains clear but is covered with a very thin, broken, almost imperceptible layer that looks like a small amount of fine, white dust deposited on the surface of a fluid which does not wet it and into which it cannot sink. A

similar thin, dust-like layer, beneath which the fluid remains perfectly clear, forms on the surface of some liquid media. This dust-like layer, when smear preparations of it are made and examined microscopically, has the appearance of a pure culture of the germ. In stab cultures the growth is located mainly at



PLATE I.—Lesions caused by udder bacillus.

the surface, about the point of the puncture, giving the impression that multiplication, as with the tubercle bacillus, depends upon actual contact with air.

No growth has been obtained on any gelatine medium; on potato an almost imperceptible, flat, glistening layer with a very faint pink hue is formed, and we are not certain that growth occurs in milk. Milk tubes, inoculated directly from glycerine-bile-agar tubes, and milk tubes inoculated from such milk tubes,

contain enough infection to cause the disease on injection into Guinea pigs, but when the transfers from milk tube to milk tube are carried to the sixth generation the fluid seems to be innocuous, and no germs are distinguishable microscopically in any of the milk tubes. On all media the growth is slow.

The temperature required for artificial cultivation is, as far as we have been able to determine, from 37 to 39 degrees C., and the thermal death point of the bacterium is 60 degrees C., maintained for 15 minutes.

The germ is a Gram-positive, non-acid-fast bacillus with rounded ends, of about the size of a tubercle bacillus of the bovine type. On cover-glasses from cultures, stained with Loeffler's methylene-blue, the individual bacilli appear very minute and somewhat separated from each other; stained with Sterling's or anilin gentian-violet they appear to be larger and to lie closer together.

We have repeatedly isolated this bacillus from the lesions in affected Guinea pigs, have grown it in pure cultures, have caused the disease in other Guinea pigs with the pure cultures, and have recovered pure cultures from the tissues of the latter. So far the Guinea pig is the only animal species for which we have found it to be pathogenic, although we have injected it into rabbits, hogs, sheep, cats, dogs, chickens and cattle. Its extremely slow and chronic action on Guinea pigs, however, suggests that further inoculation tests with the other species of animals, if a sufficiently long period of time is permitted to pass, may give positive results.

Guinea pigs become infected either through the inoculation or the ingestion of pure cultures or of naturally infected milk, but show no well marked lesions until after the passage of six weeks or more. The gross anatomical lesions are an extreme enlargement and oedema of the lymph glands generally; the appearance of small glistening nodules in the lungs, which seem to be caused by the enlargement of minute lymph glands that are ordinarily too small to be visible; the conversion of the minute nodules in the lungs into larger, necrotic areas; an enormous

enlargement of the spleen, often to 30 and 40 times its normal volume; an irregular thickening of the capsule of the spleen, through which its surface becomes marked with white areas varying in size from mere points to several centimeters in diameter; an enlargement and degeneration of the liver, which organ becomes thickly beset on surface and section with irregular,

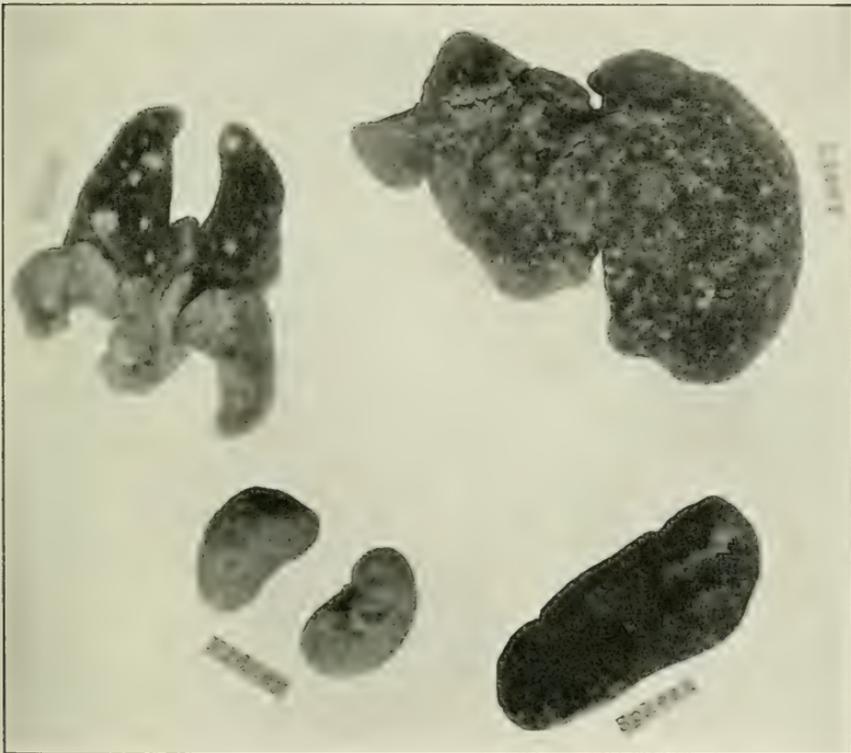


PLATE II.—Lesions caused by udder bacillus.

pale yellow or dirty white areas that seem to be due to an enormous proliferation of connective tissue and a consequent crowding out and obliteration of the liver cells proper; a diffuse, parenchymatous nephritis that reaches stages in which dense, fibrous nodules are formed in the cortex of the kidneys, and, in male Guinea pigs, a degeneration of the testicles, commonly beginning in the epididymis and often resulting in the conversion of one or both testicles into structureless cysts filled with creamy

pus. When the disease is due to the subcutaneous inoculation of pure cultures, there are no local lesions or pathological conditions referable to the point at which the inoculation was made.

In a small but not inconsiderable proportion of the infected Guinea pigs a curious enlargement about some of the bone articulations occurs, through which the affected joint becomes stiff and useless. This condition is especially interesting from the bacteriological point of view, because, in the several cases in which careful examinations were made, it was found to be associated with a fairly large micrococcus, thus forecasting the possibility, as the condition has never occurred among the numerous other Guinea pigs we have had under observation at the Experiment Station, of a micro-organism that is harmless by itself but capable of doing serious injury in symbiosis with another micro-organism. That this is not altogether a hypothetical view, but rather an inference drawn from experimental, though as yet, admittedly, inadequate evidence, is shown by the occurrence of the joint disease in one of six Guinea pigs, two of which were injected with a pure culture of the bacillus, two with a pure culture of the micrococcus and two with mixed cultures of the bacillus and the micrococcus. It was one of the latter two that became affected with the joint disease. The two Guinea pigs injected with pure culture of the micrococcus remained perfectly healthy, and the four, of which two received pure culture of the bacillus and two mixed cultures of the two bacteria, in addition to the joint disease in one, all developed the characteristic lesions the bacillus causes in Guinea pigs.

Probably the most remarkable thing about the bacillus is its expulsion from the bodies of apparently healthy cows with their milk, and hence it is desirable to show that this is really a fact and not a supposition backed by doubtful evidence. First, the bacillus was repeatedly proven to occur in milk, collected with the utmost precautions against extraneous contamination, from a number of cows that had previously been found to be infected; and second, its presence in the milk, and in tissue from

the udder and supramammary lymph gland of one cow was proven in the following manner:

Station Cow No. 220, which had been known for some time through the injection of her milk into Guinea pigs to be infected, was killed. Immediately before her death her udder was care-



PLATE III.—Lesions caused by udder bacillus and tubercle bacillus mixed.

fully washed and disinfected and her teats closed with strong ligatures, and directly after her death her udder, including the supramammary lymph glands, was cut from her body. The skin was then dissected from the udder, and the entire denuded surface thoroughly scorched with the flame of a large Bunsen burner; the flamed surface was next incised with a sterile knife and milk collected in sterile pipettes, through the incisions, separately from each quarter, at points well removed from the teats. With

equal precautions fragments of tissue were taken from one front and one hind quarter of the udder, from the supramammary lymph gland, and from the liver and the spleen, and this material inoculated subcutaneously into 15 Guinea pigs as follows:

One Guinea pig, milk from right front quarter of udder—positive.

One Guinea pig, milk from right hind quarter of udder—negative.

One Guinea pig, milk from left front quarter of udder—positive.

Two Guinea pigs, milk from hind quarter of udder—negative.

Two Guinea pigs, tissue from front quarter of udder—positive.

Two Guinea pigs, tissue from hind quarter of udder—negative.

Two Guinea pigs, tissue from supramammary lymph gland—positive.

Two Guinea pigs, tissue from spleen—negative.

Two Guinea pigs, tissue from liver—negative.

The quantity of milk obtainable from the cow's udder, as she was nearly dry at the time of her death, was very small, otherwise two Guinea pigs would have been inoculated with milk from each quarter. It should be noted that the inoculations show positive results with both the milk and the tissue from the front quarters of the udder, and negative results with both the milk and tissue from the hind quarters, and that strength is added to the evidence which proves that the germ was located in the depths of the udder by the positive results obtained with the inoculation of tissue from the supramammary lymph gland.

The post mortem examination of the cow revealed nothing to explain the persistent occurrence of the bacillus in her milk, excepting a few small areas of slight induration in her udder. A second cow that also expelled the bacillus with her milk has been killed, examined post mortem and material obtained from her body for Guinea pig injections. The autopsy showed no other lesions than were found in the first cow, and it is too early to

report on the Guinea pigs. It may be well to add that the blood and urine of several cows from which infected milk was obtained were tested by inoculating Guinea pigs, and invariably failed to cause disease.

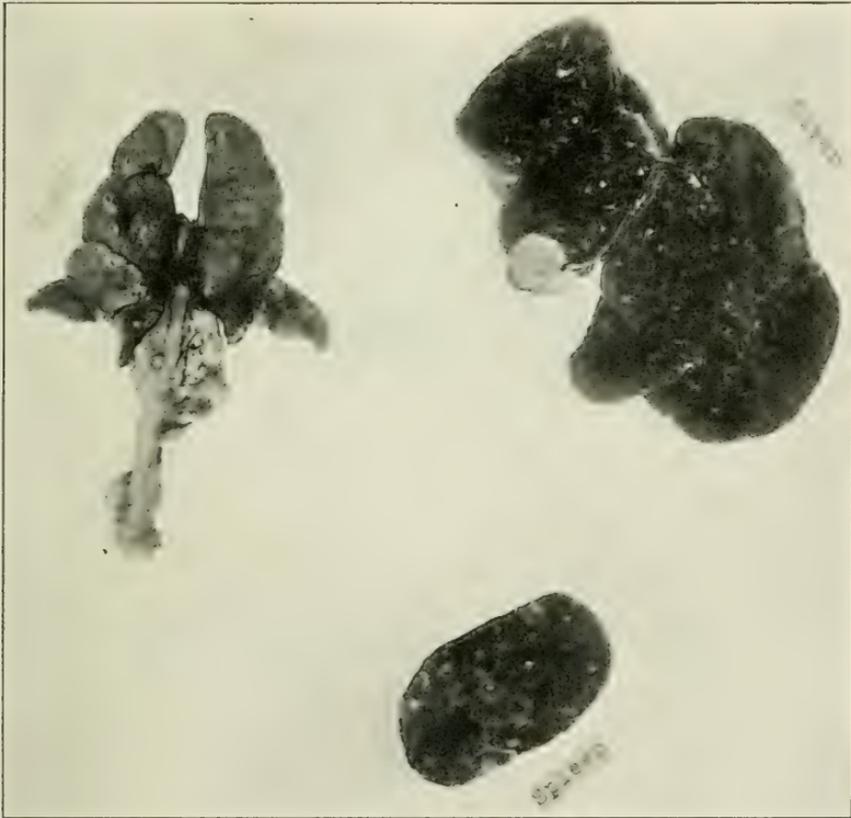


PLATE IV.—Lesions caused by tubercle bacillus.

Some studies relative to the way in which the udders of cows become infected have been made. In this connection several cows were selected and proved by repeated injections of their milk into the abdominal cavities of Guinea pigs to be free from the infection. On the udder and teats of one cow pure cultures of the bacillus were rubbed; another cow was fed pure cultures in her drinking water, and a third was given subcutaneous injections of

pure cultures. This work is not yet complete, but as far as it has gone it has given negative results.

The frequency with which we found the bacillus to occur in ordinary market milk is illustrated by the samples we have examined since we first observed the curious disease in Guinea pigs. In one series we tested 77 samples of milk from 31 dairies; 8 of the samples derived from 6 different dairies were found to be infected. In another series we tested 140 samples from 4 dairies, with the following results:

Dairy a, 35 samples, 11 infected.

Dairy b, 33 samples, 7 infected.

Dairy c, 34 samples, 2 infected.

Dairy d, 38 samples, 2 infected.

The 77 samples in the first series of tests, with the 140 in the second, make a total of 217, among which 30, or nearly 14 per cent. were proven to contain the bacillus. As dairies a, b, c and d are among the 31 from which the 77 samples of the first series of tests were obtained, and are 4 of the 6 infected, the proportion of infected dairies is not changed by the second series of tests.

In addition to the samples of market milk, we have tested one sample each of the milk from 140 dairy cows that constitute a single large herd in the District of Columbia, and of 36 cows that belonged to the Experiment Station at Bethesda, Md. Among the 140 cows the bacillus was found in the milk of 19, and among the 36 cows it was being passed by 11. The 140 cows form a herd that has been repeatedly tested with tuberculin, and which is very probably free from tuberculosis. A large proportion of the 36 Station cows was affected with advanced tuberculosis, and among the 11 that were found to be passing the bacillus, 8 were advanced cases of tuberculosis, 1 was affected with actinomycosis and 2 were apparently healthy.

One of the tuberculous cows at the Station that was passing the bacillus was affected with tuberculous disease of her udder. Her milk caused both tuberculosis and the other disease in the Guinea pigs injected with it, showing that the two diseases can

live in harmony in one animal body; in fact, each seemed to increase the pernicious potency of the other. Guinea pigs with the double infection formed interesting subjects, because the tubercle bacillus in their lesions could easily be demonstrated in stained preparations, while the other bacillus, which was microscopically

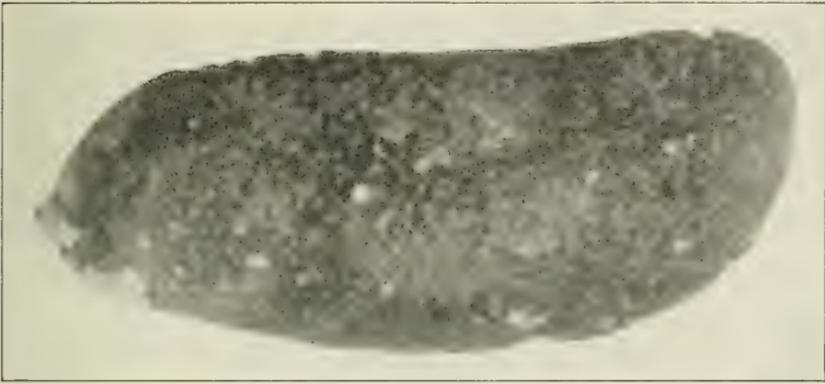


PLATE V.—Spleen of guinea pig affected with tuberculosis in combination with udder bacillus disease.

Weight of spleen, 31 grams. Normal weight of guinea pig spleen, less than 1 gram.

invisible to us, could be cultivated on media that is unsuitable for the tubercle bacillus.

What the real significance or practical importance of this apparently newly discovered bacillus, which appears to have escaped detection in the past very likely because of the difficulties associated with its artificial cultivation and the length of time it requires to cause well-marked lesions in Guinea pigs, may ultimately prove to be, we are unable to say. But no one can doubt that the common occurrence of a micro-organism, pathogenic for any species of animal, in an article of food as widely and as extensively used as milk, deserves that we should study it with the greatest care, especially after it has been shown that it is an organism which has the udders of apparently healthy cows as its normal habitat, and which, therefore, cannot be certainly excluded from milk, no matter how much cleanliness and care are used in its production. In this sense the germ forms another link in the long chain of facts that point, unmistakably, to the

proper pasteurization of all milk, before it is used as food, as a measure essentially necessary for the protection of public health.

#### DESCRIPTION OF PLATES.

The organs shown in the plates are all from Guinea pigs, and are of natural size.

Plate I. Lesions caused by udder bacillus. The testicle is necrotic throughout, excepting the dark lines, which are bands of connective tissue. The white spots in the kidneys are fibrous nodules in the degenerated cortex.

Plate II. Lesions caused by udder bacillus. The white spots in the lung are an advanced stage of a condition which first manifests itself in the form of very minute, glistening, almost transparent nodules, which gradually increase in size, develop gray centers, and finally become comparatively large necrotic areas.

Plate III. Lesions caused by udder bacillus in combination with the tubercle bacillus. Each bacillus seems to increase the pathogenic potency of the other for Guinea pigs.

Plate IV. Lesions caused by the tubercle bacillus. A comparison of this plate with Plates I. and II. will show the remarkable similarity in the microscopic appearance of the lesions caused in Guinea pigs by the udder bacillus and the tubercle bacillus.

Plate V. Spleen affected with tuberculosis in combination with the disease caused by the udder bacillus. The organ weighed more than 40 times as much as a normal Guinea pig spleen, and its enormous size is due to the udder bacillus.

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DR. D. WARNOCK (M.R.C.V.S.), Pincher Creek, Alberta, Can., was elected a member of the Federal House of Commons to represent McLeod Federal Constituency, after sitting two years in the Alberta Legislature as member for Pincher Creek Riding. He was the Liberal or reciprocity candidate on the recent election for McLeod Constituency and carried the state by a majority of 819.

## POLL-EVIL.\*

BY R. C. MOORE, KANSAS CITY VETERINARY COLLEGE, KANSAS CITY, MO.

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Poll-evil is one of the very common ailments of the horse and consists of an inflammation of the poll or anterior part of the top of the neck from the occipital crest to the posterior end of the axis. It is at first acute but becomes chronic, and later there is often suppuration and necrosis of the ligamentum nuchæ.

*Etiology.*—It invariably results from an injury. The tissues are bruised by striking the top of the head against the ceilings of low stables, tops of low doors, limbs of trees, by falling on the hard ground or stony road, by getting the head fast in doors, fences, mangers and like places, or by blows from clubs, etc.

*Tissues Involved.*—The bursa of the ligamentum nuchæ where the ligament passes over the spine of the dentata, the ligamentum nuchæ, cellular tissue, fasciæ, bones, articulations and meninges are the tissues usually involved in this condition.

*Course.*—Bruising of the tissues of this region is followed by an outpouring of serum, either into the bursa of the ligamentum nuchæ, distending its walls, or the fluid becomes sacculated in the cellular tissue, forming a hygroma. The swelling is circumscribed with a more or less prominent demarcation between the distended parts and the surrounding tissues, and there is usually a limited amount of heat and little or no increased sensitiveness. If the injury is mild, does not become infected and is not repeated, resolution by absorption will most likely follow. The absorption may be only partial and be succeeded by organization of the serum, thus leaving a hard, fibrous mass, sometimes called the chronic form, which diminishes in size but becomes more dense and firm.

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

In chronic bursitis, the bursal wall undergoes a change, that is, it becomes thickened. Substances resembling grains of rice, called oryzoids, become detached from the wall and sometimes nearly fill the cavity. When the bursa is opened, a quantity of serum, more or less bloody, escapes, which may contain oryzoids.

Infection may occur through the skin or by metastasis through the blood or lymph, and the swelling increase and become more diffused. The line of demarcation of the bursa disappears, the entire region is swollen, hot and painful, and the animal, dreading to move, stands with nose protruded. The cutaneous lymph vessels over the region become distended, appearing as raised lines in the skin, which usually radiate from a common centre. Later fluctuation may be noted on palpation.

The swelling may be on one or both sides. The abscess is usually central, the variations of the swelling being due to the difference in tissue resistance of the two sides.

The pus is sooner or later liberated by necrosis of the cutaneous tissues at the point of least resistance. Fistulous tracts, necrosis of the fascias and the ligamentum nuchæ, are produced by filtration of pus through the surrounding cellular tissue, and this is accompanied by a copious discharge of pus having a disagreeable odor. The fistulous tracts may extend to the vertebrae, penetrate the bones, even involve the spinal meninges and produce death by septic meningitis, or the inflammation may extend to the articulations, thus causing arthritis, which may result in ankylosis of either the occipito-atloid or the atlo-axoid articulations, or both, producing stiff neck.

*Prognosis.*—Prognosis of poll-evil has always been more or less doubtful, convalescence being so slow and the animal so often left blemished, with more or less danger of a return of the disease, that its value is greatly depreciated. The care and expense of treatment is so great as to make the financial consideration a problem to both the owner and the practitioner.

The chief cause for the long continuation of the disease is to be found first in the difficulty of establishing and maintaining

perfect, free and easy drainage of the deep parts involved. It should be understood that such drainage does not consist in an opening into a pus cavity through which pus will flow out by pressure of surrounding parts, or as a vessel will overflow when more fluid is forced into it than it can contain, but rather consists in an opening from the very lowest point, downward and outward, so free from obstruction that wound secretions and pus cannot remain in the wound and pus cavity. Low power of resistance to the necrosing action of pus is perhaps nowhere more marked than in the ligamentum nuchæ and is a factor in making the prognosis doubtful.

If purulent and necrotic changes have not taken place, and if asepsis be maintained and the injury is not repeated, absorption of the tissue fragments and inflammatory exudate with complete resolution usually occurs, and this is made more certain by the late method of controlling or preventing pus formation by the use of bacterins.

*Treatment.*—Perhaps no ill to which the horse is heir has been subject to so great a variety of treatments as poll-evil. Everything that the human mind could conceive, from pouring pounded glass in the ears, putting setons in the tail or destroying the tissues of the poll with caustic, to the later and most approved methods of surgery, have been resorted to. The chief results in a large per cent. of cases treated have been to intensify and prolong the poor animal's suffering.

The scientific treatment of poll-evil, as of many other diseases, should always depend largely upon the state of the disease. The application of remedial methods indicated in the non-suppurative stage would be of little value in the infective inflammatory condition; and the operative surgical treatment of a case in the non-infective stage, which would be indispensable in the suppurative and necrotic stage, would not only be unnecessary but detrimental as well, and greatly increase the animal's suffering.

In the early stage and in a case where there is no infection, as evidenced by the absence of pain, heat or distended cutaneous lymph vessels, and more particularly if the outline of the dis-

tended bursa or hygroma is well defined, treatment should be given that will assist nature to absorb the exudate and prevent pus formation. This may be accomplished by keeping the region cool and as near aseptic as possible, supplemented by the subcutaneous administrations of bacterins at intervals of four to six days. The region may be kept cool by the application of ice packs over the poll, which may be conveniently made by mixing bran and cracked ice in a neat bag, tied to the head-stall and under the throat. After a lapse of three or four days, the cold packs may be supplemented by the application of tincture of iodine or iodine liniments. If this treatment is adhered to and the injury is not repeated, absorption is usually rapid and complete.

If some organization of serum takes place and fibrous enlargements result, blistering with biniodine or mercury ointment at intervals of two to four weeks will be beneficial. Aspiration is rarely if ever beneficial and increases the danger of infection.

*Radical Surgical Treatment.*—If the foregoing treatment fails to produce absorption, or if infection has taken place with abscess formation or necrosis, or if there already exists a fistulous tract, then radical surgical treatment is indicated and no time should be lost in executing it. Here three essential surgical features should be observed and rigidly carried out:

First—Removal of all necrotic tissue.

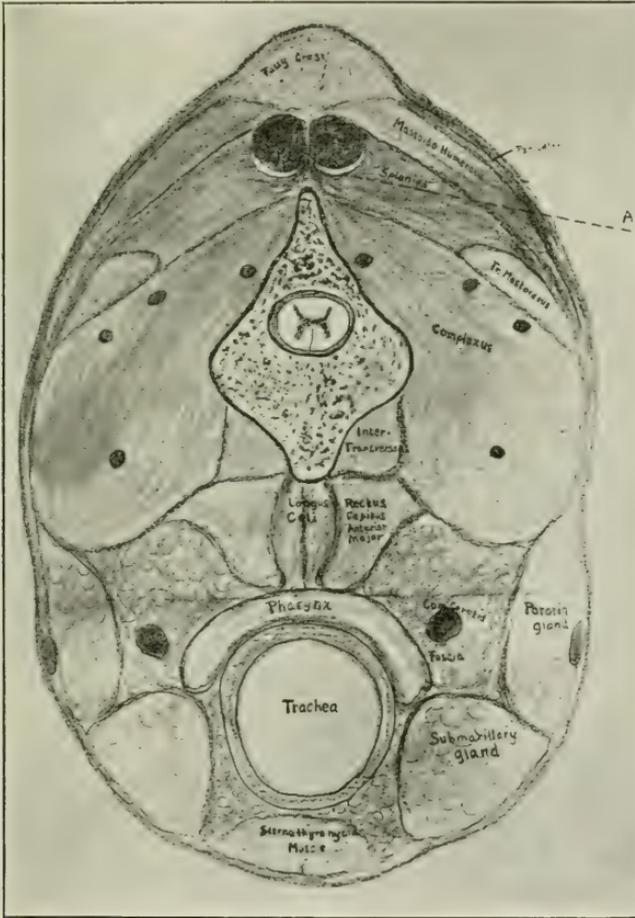
Second—Establishing and maintaining perfect, free and easy drainage from the deepest part of the fistula.

Third—Keeping the parts clean and as near aseptic as possible.

The first difficulty the surgeon encounters where the ligamentum nuchæ has not become necrotic, is to establish drainage to the space between the two cordiform parts of the ligament.

By viewing a cross section of the poll, it will be seen that the inferior surface of each rounded ligamentum nuchæ rests on a lower plane than their internal borders where the two cords contact each other, thus leaving an elevation, as it were, in the floor of the bursa extending between the cords. The space thus

formed is filled with loose cellular tissue, and when there is sup-  
 puration, the pus is retained by the pressure of each cord on the  
 floor of its respective side of the bursa. Pus thus imprisoned  
 often burrows along between the two cords to the occiput, and  
 may extend backward and invade the lamellar portion of the



CROSS SECTION OF THE NECK OF THE HORSE  
 THROUGH THE AXIS.

ligament, producing deep-seated abscesses in the sides of the  
 neck as well as necrosis of any part of the ligament.

Early drainage of this space will usually prevent necrosis.  
 The writer has frequently discovered such abscesses between the

two cords by forcing the finger through a fistulous tract that passed beneath the ligament. The flow of pus immediately ceased when the finger was removed, showing that the ligament acted as an obstruction. To drain this region it is necessary to divide one cord of the ligament and carry the incision outward, downward and backward, cutting through the skin, fascia and underlying muscles as indicated by the dotted line "A" in the accompanying drawing.

To divide the ligament it is best to pass a probe-pointed bistoury under the cordiform portion at its juncture with the fistulous tract and divide it transversely from below, upward, carrying the incision outward and upward through all the tissues, including the skin. This may be accomplished by restraining the animal with a twitch. Some hæmorrhage will follow, but it is easily controlled by torsion. Careful attention should be paid to antisepsis, both during the operation and in the after-treatment.

The wound should be carefully observed each day, and if increased swelling or extensive granulations obstruct the drainage, the outlet must be deepened and widened to suit.

As long as the ligament remains sound, it conveys a sense of firmness and smoothness to the finger when palpated, but should any part of it become necrotic, it has a soft, doughy feeling, in which case the wound discharge continues profuse, is thin and has a very offensive odor.

When all necrotic tissue has been removed and the drainage is perfect, the swelling and soreness diminishes, pus decreases in quantity but increases in density, becomes thick and yellow and has a less offensive odor. When these results have not been secured, no time should be lost in searching for necrotic tissue, or undrained fistulous tracts, which must be removed, drained or opened, as the case may be.

A part of one or both cords of the ligamentum nuchæ may be necrotic, and when this occurs, all diseased parts must be excised. This is best done by placing the horse in the lateral, decubital position (preferably on an operating table) and main-

taining complete anæsthesia. The hair is shaved from the occipital crest back to the posterior end of the axis and well down on each side of the neck; thoroughly cleaning and disinfecting the operative field; making a longitudinal incision in the median line from the occipital crest back beyond the probable extent of the necrosed ligament (keeping in mind that it is far better to remove some of the sound tissue than to leave the least trace of necrotic substance); carrying the incision down through the cutaneous and subcutaneous tissue to the cordiform part of the ligamentum nuchæ; separating the ligament from its fellow and the surrounding tissue; dividing it obliquely from below upward and backward to insure the removal of all diseased tissue, then carefully detaching it from the occipital bone. If the other cord is diseased, it is to be treated in like manner. Drainage is secured by making an incision from the very posterior end of the longitudinal incision outward, downward and backward through the tissues described heretofore, being careful to make it in such direction as to insure the covering of the scar by the overlapping of the hair. One such incision will answer for both sides. If only one cord is removed, the drainage incision must be on the same side; if both cords are removed, then the drainage incision may be on either side. All other things being equal, it is best to make it on the side that is covered by the mane, as the scar will be less noticeable. In all cases the drainage incision must be made through the skin and subcutaneous tissues deep enough and wide enough to insure free and easy drainage. The operator should control all hæmorrhage, pack the wound with sterile gauze and close all but the drainage incision by suture, which should be removed the next day, and then the wound may be irrigated daily for fifteen to twenty minutes with formalin solution, using one part of formalin to one thousand parts of water. All irritating substances and caustics or escharotics are contra-indicated and should never be used. When caustic agents are introduced into fistulous tracts about the poll or withers of the horse, they destroy more or less of the yellow elastic tissue which does not readily separate from the sound

parts, thus leaving fragments of diseased tissue extending into the ligament between the healthy fibres, which favors abscess formation. This is often the cause of a recurrence of the disease, even months after the patient has apparently recovered.

*The Use of Bacterins.*—Probably no other step in the forward stride of modern medicine and surgery has proven of more value in the after treatment of surgical wounds, abscesses, fistulæ, necrosis and suppurating conditions in general, than properly prepared bacterins, and no practitioner of medicine realizes their need more than the veterinarian, because of the difficulty in maintaining asepsis in his patients. But in such cases as described above, they will only be beneficial when used in connection with such surgical procedure as will insure the removal of all necrotic tissues and afford and maintain perfect wound drainage.

Provided the disease has not extended to the bone, articulations, or to the lamellar portions of the ligamentum nuchæ, the prognosis is favorable if treatment is carefully carried out along the lines indicated.

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DR. W. E. STRIBLING, B. A. I., has been transferred from Manila, P. I. to Earlham, Iowa, which place he will probably reach about November 1.

AN IMPORTANT DATE.—As a reminder of the notice published in the September REVIEW, the United States Live Stock Sanitary Association will hold its fifteenth annual meeting December 5 and 6, in Chicago.

DR. H. PRESTON HOSKINS, Philadelphia, has gone to St. Paul, Minnesota, where he will be associated with Prof. M. H. Reynolds, Division of Veterinary Medicine, at the University of Minnesota College of Agriculture and Experiment Station. We congratulate Dr. Hoskins on his association with such a thorough, painstaking investigator and honorable gentleman as Prof Reynolds.

# OBSERVATION ON THE MERITS AND PRACTICABILITY OF RESECTION OF THE FLEXOR PEDIS PERFORANS TENDON, FOR THE RELIEF OF OPEN NAVICULAR BURSA AND BAYER'S OPERATION FOR QUITTOR.\*

BY GEO. H. BERNS, D.V.S., BROOKLYN, N. Y.

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## RESECTION OF THE PERFORANS TENDON.

This operation was described by Andre De Fleurens as early as 1853, by Nocard 1879, by Lustig, Froehner, Cadiat, Moller, Pfeiffer, Hess and others of France and Germany, and by W. L. Williams and L. A. Merillat of this country more recently. Strange as it may seem, it has received but scant recognition by the veterinary profession at large, and but few practitioners have availed themselves of its many advantages. However, this is not to be wondered at when we consider the formidable character of the operation and the functional importance of the structures involved; when we are told in our text books describing the technique to remove the horny frog, remove the entire sensitive frog, completely divide the flexor perforans tendon transversely, remove its distal end from the semi-lunar crest, expose the navicular bone, destroy its beautiful gliding surface by curetting away its cartilage of incrustation, the conservative veterinarian naturally hesitates; for he fails to see how a satisfactory recovery can possibly take place when these important structures have been either entirely removed or mutilated to such an extent as to completely destroy their functions. He remembers his unsuccessful attempt at treatment in accidental ruptures of the perforans tendons in cases of breakdown, and the persistent lameness and unsatisfactory termination in all cases of navicular disease, and is very apt to conclude that at best only a partial

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

recovery can reasonably be expected and that it will take months to accomplish this result, and therefore considers the operation of no practical value.

I was very much in this frame of mind when W. L. Williams visited Brooklyn in 1904, made his headquarters at our hospital, and remained a month with us to study veterinary practice in a large city. A number of bad foot cases, quittors, horn tumors, fractured bars, suppurating corns, centre and quarter cracks and punctured nail wounds of the plantar surface were admitted and operated upon during this time. Among them were five or six cases of what were diagnosed as open coffin joints, characterized by excessive lameness, discharge of synovia from the puncture, and more or less elevation of temperature. Our experience with cases of this kind had been extremely unsatisfactory, losing probably ninety per cent., and securing very tedious and probably only partial recoveries in ten per cent. The fatal cases were put down as articular synovitis and considered hopeless from the start, while those that recovered were diagnosed as tendonous synovitis, with a chance to recover if the articulation did not become involved, but as it was impossible to distinguish between the two conditions in the early stages, all were kept under treatment, until the cases became either positively hopeless from infection of the entire sensitive structure of the foot, gangrene and casting off of the horny shell or infection of the entire limb and were destroyed; or the few in which the synovial discharges were supposed to come from the tendon sheath were preserved with, and if the sound foot on the opposite side did not develop acute laminitis or breakdown at the fetlock, which frequently happened if a hind foot was affected, it would take weeks or months to restore the animal to even partial usefulness.

There were two bad cases of open coffin joint admitted to the hospital during the first few days Dr. Williams was with us. He advised complete resection of the perforans tendon and kindly volunteered to perform the operation. One animal, as I recall the circumstance, had a temperature of about 105, hopped

on three legs if made to move, and kept the affected foot constantly in motion, and indication of intense pain was plainly depicted on his countenance. There was no synovial discharge from the puncture, but as near as could be determined under the circumstances, probing of the wound pointed to the articulation.

The hopeless condition of the poor horse and my confidence in Williams as an operator prompted me to reluctantly consent to the operation.

The animal was placed upon the operating table, anæsthetized and operated upon by W. L. Williams as described in his little work on "Operative Veterinary Surgery." When the fibro fatty frog had been removed the puncture through the tendon was plainly visible, and when the transverse division of the tendon was attempted, a quantity of purulent synovia, which had been securely pent up, escaped with sufficient force as to cover the front of the operator's gown. After the tendon had been divided and removed from its attachment to the semi-lunar crest and the navicular bone exposed, the spot where the nail had entered was plainly indicated by discoloration and a small depression in the cartilage of incrustation of the navicular bone. The operation was completed in about forty-five minutes and the patient regained his feet in one hour and thirty minutes and walked to his box stall, a distance of about fifty feet, showing but little lameness, which, of course, was due to the anæsthetic effect produced by the use of the elastic tourniquet which had been employed. Patient enjoyed a good night's rest and the following morning he was very comfortable. He got up without assistance, temperature down to 101, and ready for his breakfast. His temperature was taken regularly twice a day and it ranged from 99 to 101. His appetite was good and on the tenth day he began to place a little weight upon the point of the toe when forced to move. He was led to the dressing floor, a distance of about fifty feet, without very much trouble; all the dressings were removed; the wound presented a perfectly healthy appearance, and the iodoform which had been placed in the wound was practically dry, indicating that no suppuration had

taken place. The foot was dressed antiseptically every two days and the healing process carefully watched. At the expiration of three weeks a shoe was applied and the dressings retained in position by means of pieces of hoop iron wedged under the web of the shoe.

In a month the wound had almost completely healed and in five weeks the patient walked home, a distance of nearly two miles. In about two months he showed no lameness on a walk and was ordered to slow work. In three months all the lameness had disappeared and he not only walked but trotted sound and he is to this day doing his work regularly, hauling heavy loads of brick for the John Morton Co., of Brooklyn, who are his owners.

His new frog is small and imperfect, but the bars appear much stronger and better developed than ordinarily. The foot is fully as large as its fellows and shows no deformity externally.

The second case was operated on two or three days later, and the operation was witnessed by a number of prominent Brooklyn and New York veterinarians, who had been invited with Dr. Williams' consent, to see this new and untried method demonstrated. Some were so favorably impressed that they sent over cases of their own, and I think five or six cases of open navicular bursa were operated on by Williams during the first ten days or two weeks. One horse developed inhalation pneumonia and died three days after the operation, but all the rest made satisfactory recoveries within two or three months.

Two other cases with serious complications were presented for operation; one proved to be an open and badly infected coronae pedal articulation, and the other was complicated with infection of the tendon sheath and multiple abscesses. Both animals were placed upon the table for examination, and when their true condition was discovered they were promptly destroyed.

Encouraged by Dr. Williams' success, we started in to practice this radical operation in September, 1904, and we are still

doing it. Several hundred horses have been operated upon, and the results have been most gratifying. While we have not kept accurate account of the number of cases and terminations of each, I think I am safe in saying that fully eighty per cent. made uneventful and complete recoveries in from two to four months; five per cent. developed abscess of the tendon sheath in the hollow of the heel, and while most of them got well eventually, this complication prolonged convalescence for a month or two. Ten per cent. had to be destroyed within a week or two after the operation, by reason of open and infected coronae pedal articulation, which had been overlooked if they existed, accidentally sustained and not noticed during operation, or had been infected prior to operation and showed no indications of it. The other five per cent. developed contraction of the heels and persistent lameness from this cause, which, however, was readily controlled by the application of hoof-expanding springs under the shoes.

#### INDICATIONS FOR THE OPERATION.

All cases of punctured nail wounds of the plantar surface from which there is a discharge of synovial fluid should be operated upon without delay. Every nail puncture in the vicinity of the joint or bursa which shows no improvement under ordinary treatment in a week, and patient develops an elevation of temperature from this cause, even if there is no synovial discharge, should be placed in stocks or upon the operating table for examination, or operation, if necessary.

It frequently happens that a sort of a valvular opening into the bursa exists, and that quantities of purulent synovia are pent up, which, if left undisturbed, not only cause most intense pain, but are sure to produce destructive changes in the neighboring tissues of a most serious character, and what in the earlier stages is a curable condition is rapidly converted into an incurable one. If the bursa is not involved there is no harm done even if all the horny frog and a good-sized portion of the fibro fatty frog is removed and the plantar aponeurosis exposed, for

it is more than likely that the tendon has been injured and requires attention.

In chronic suppurating corns, necrosis of the wing of the pedal bone, ulcerating and fractured bars, we occasionally have the bursa infected, which is characterized by excessive lameness, great pain or twisting or rotating the toe, more or less elevation of temperature, and probably a discharge of synovia; this operation is of the greatest value, and frequently enables us to restore practically hopeless cases to usefulness.

*Prognosis.*—Favorable if the corono-pedal articulation is not involvèd; and it is a clinical fact that in four cases out of five the bursa only is punctured. If, on the other hand, the joint is open and discharging purulent synovia, the case is hopeless and should be destroyed at once. This condition can only be determined in the early stages by this operation, which enables the surgeon to forecast the probable termination of the case, with a great degree of certainty; and in our practice we make it a point to obtain the owner's consent to destroy the horse, if the operation reveals that the case is hopeless. The termination of all these cases depends to a large extent upon the skill and care of the surgeon, the environments under which the patient is operated upon and kept after operation, and the disposition and temperament of the patient; cleanly surroundings and proper facilities are necessary, and I consider an operating table and a loose box stall containing a bed of peat moss ten or twelve inches deep, almost indispensable.

Horses of a nervous temperament will frequently stand up persistently, and incessantly try to place weight upon the affected foot, and work themselves up to a state of excitement bordering on delirium.

Dunghills and lymphatic brutes will, after one or two feeble and unsuccessful attempts to rise, lose all courage and helplessly flounder about the stall, strike the heads violently upon the floor, tear or scrape off the dressings you have so carefully applied, make no real effort to get on their feet, and do all but commit

suicide, but, fortunately, the vast majority of horses accept conditions as they exist and take excellent care of the sore feet.

This operation, perhaps more than any other, demonstrates the wonderful reparative powers of nature, for these animals as a rule make perfect recoveries and show no lameness nor defective action. This applies to the ordinary business horse only, as far as our knowledge goes, for we have had no experience with high-stepping coachers, hunters, runners or trotters.

I forgot to mention a slight change in the technique, which we consider of some importance. We save a small strip  $\frac{1}{4}$  to  $\frac{3}{8}$  of an inch of the horn secreting fibro fatty frog on each side of the pyramid, which, while it affords ample room to complete the operation, greatly facilitates the healing process and leaves the horse with a much larger and stronger frog.

#### BAYER'S OPERATION FOR QUITTOR.

As I have already taken up too much valuable time, I shall refer to this operation very briefly and confine myself chiefly to results.

This operation was also demonstrated by W. L. Williams in Brooklyn in 1904, and has been practiced by us to a very considerable extent since that time.

*Indications.*—Seven years' experience has convinced us that this operation is indicated in all quittors of comparative recent origin in which no great structural changes of the skin and subcutaneous cellular connective tissues covering the cartilage have taken place; and if the operation is skillfully and carefully performed under cleanly surroundings and proper facilities, healing by first intention of the incisions through the coronary band, skin and laminal structures, will follow in nine cases out of ten. The animal will be fit for work in a month or six weeks, and at the expiration of from nine to ten months, nothing but the slight scars in the skin above the coronet will indicate that the foot was ever operated on.

It is contra-indicated in all quittors of long standing that have been unsuccessfully treated, with caustics and escharotics.

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which not only destroyed parts of the cororary band and left a large portion of the skin and underlying structures a mass of cicatricial tissues, but by intermittent and prolonged irritation caused complete degeneration, hypertrophy and a general loss of vitality and reparative powers of the parts involved. In such cases the radical operation of Bayer is very apt to be followed by troublesome quarter cracks, ringbones, sloughing of the flap and possibly open joint. Dr. Moore's modification of Bayer's operation, or Dr. Merillat's new operation for quittor, will certainly answer a much better purpose.

We believe that most all quittors are benefited by operative intervention, but as their conditions vary to such a very great extent, it is impossible to lay down hard and fast rules for all cases; for what proves highly successful in the hands of one man is often a total failure in the hands of another.

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DR. WARD GILTNER, assistant bacteriologist at the Michigan Agricultural College, has been appointed state veterinarian for that state.

THE first-year class at the Ontario Veterinary College this year is larger than last year; it was making a strong run for the century mark at the last report.

HON. H. H. HALLADAY, of Clinton, Mich., has been appointed on the Michigan Live-Stock Sanitary Commission in place of Mr. C. A. Tyler, whose term expired in July.

DIDN'T HAVE TO BE.—*Puck*:—New Suburbanite—I suppose this is pasteurized milk, my friend?

Village Milkman (witheringly)—Not so's ye kin taste it, I reckon, mister. In fact, I'll hand ye a five dollar note if ye kin prove any uv my cows wuz bit by a mad dog!—(*New York Herald*.)

## CAUSE AND TREATMENT OF PULMONARY EMPHYSEMA.\*

BY WALTER G. HOLLINGWORTH, UTICA, N. Y.

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In going over the literature, I find that the exact causes are rather a problem. Authors do not agree on all conditions, but what they agree on is, that pulmonary emphysema, if not the most influential, is the most frequent of the proximate causes. The most noted writers say that broken wind is at first purely a nervous affection, dependent on the unhealthy condition of the digestive tract, brought about by neglect of diet; and the pathological lesions are to be attributed to the effects of the nervous disease, which especially involves the pneumogastric nerves. A portion of the structure of the small bronchi is composed of a continuous layer of muscular tissue. Klein says the layer is especially conspicuous and important in the small bronchi, and by contracting, aids the expulsion of the air from the lungs in expiration; and when this muscular tissue undergoes pathological changes due to the irritation of the gastric branches of the pneumogastric largely, and reflected through the pulmonary branches of this same nerve to the lungs, the contractile power of this muscle is greatly lessened, and to force out the air from the distended or ruptured cells requires the long-continued or double expiration which is characteristic of chronic vesicular emphysema and broken wind. This view of broken wind seems to be more strongly insisted upon by the various teachers and writers of veterinary medicine. Pulmonary emphysema may be of different types; that is, the acute and chronic vesicular, and the interlobular. The acute vesicular type is a dilatation of the alveoli beyond its normal condition without any change of struc-

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ture: it may spread over the whole lung or lungs, though rarely, or it may affect only certain lobes. Partial emphysema often occurs when other parts of the lung becomes impermeable, especially during chronic bronchitis. This form of emphysema has no clinical importance as a rule, and if recognized, relief will be the outcome as no structural changes have developed. If long continued, the contractile power of the muscle (bronchial), or its function being impaired, may lead to chronic or subacute type; and this is due to an enlargement of the alveoli. According to Stömmer, who has very carefully studied this disease, the alveoli has increased in size from  $1/150$  to  $1/16$  inch. Now, to draw the line between the acute and chronic vesicular forms of emphysema, is a question in my mind. And these forms will lead to the interlobular type, but the interlobular type may occur independently of the vesicular type. Interlobular emphysema is an extravasation of air into the connective tissue between the lobules owing to the rupture of the air cells and small bronchials. What is the cause of this dyspnoea; that is, the peculiar condition of the expiration? Is it due to the emphysema or from some impairment of the normal contraction of the pulmonary tissue? This secondary prolonged contraction of the abdominal muscles is an effort to expel the air in the bronchi left after the regular expiratory act, and the cough that is so frequently noticed usually one characteristic exertion—once heard, always remembered—is an expulsive act to rid the extra amount of mucus or secretion in the air passages. It is a reflex nervous action. It is the opinion of some writers, and I have noticed it myself, that vesicular emphysema does exist many times, but which has not at any period exhibited any symptoms indicative of the condition known as broken wind. What I have noticed is a prolonged expiratory act which should be looked for in examinations of soundness, and it is useless for me to say that this is a condition of much importance. To what extent are horses liable to the vesicular type, which consists of the dilation of air cells, and how far the same may tend to induce broken wind, is a question. Delefond mentions that both the vesicular types are

proximate causes of broken wind; taking these conditions into consideration, it seems to me there are certain points which should be answered. It is needful that we determine whether these emphysematous conditions are invariably present in the lungs of all horses affected with broken wind, and if so, whether these textual changes in its extent bears direct relations to the severity of the symptoms exhibited during life. Also whether every case of emphysema has been coincident with the phenomena usually understood to constitute broken wind.

This difference in the character and extent of the impediment of the expiration met with in the different stages of this disease may be supposed that at first the muscular structure of the minute bronchi are merely spasmodically stretched, and that at a more advanced stage of the disease they become structurally altered. Prof. Law says progress of cultivation in our western lands is increasing this malady. Fifty years ago it was virtually unknown in Michigan and adjacent states, where now it can equal New York State. He also says it is a notorious fact that no horse becomes broken winded that has always been out to pasture.

Prof. Coleman mentions that why horses are more liable to broken wind is to be accounted for by the fact that this animal is the only subject which can be compelled to perform exertion on a full stomach. Prof. Hutyra says chronic dilation of stomach may be a cause. He also says long, spasmodic coughs, prolonged, labored expiration and inspiration, any condition where there is marked dyspnoea, horses take a long, deep breath before each cough, followed by pressure strain of the lung tissue. Stenosis of bronchi, tumors of same, older horses more frequently have because they are more subjected to hard work, malnutrition and feeding, defective, insufficient nutrition of the lung tissue. Diseases of heart and blood vessels of lung, resistance of lung tissue. Individuals, variations; no other explanation why one animal becomes diseased in a relatively short time while other horses under identical conditions either remain sound or become diseased much later on or in a very slight degree.

Hutyra says the reduced resistance of the lung tissue may be either acquired or congenital. Bonley quotes that he saw a two-year-old colt with a very bad case of broken wind, and the dam of this colt suffered from broken wind also; that would look as though it might be classed along with the hereditary diseases. Conformation, round-chested and largely developed digestive organs has been said to be a predisposing cause of emphysema. Overdue exertion, whatever may be its cause, might lead to emphysema. I saw a case of acute interlobular emphysema; the symptoms were great dyspnœa, painful, harsh cough, frothy discharge from the nostrils mixed with blood; lived eighteen hours. Post mortem showed both lungs emphysematous; previous history showed nothing the matter with the respiration. A good test if you are suspicious of heaves is to give horse all hay and water he wants and see him next day. If there is anything wrong with the respiration it will be readily noticed. Atmospherical changes will to a more or less degree affect a horse suffering from broken wind. There is a marked improvement or aggravation, the changes from conditions hardly differing from normal, and which serviceability is scarcely impaired to such as to render the horse absolutely useless for the time being. Such conditions are often met with. Stables should be kept in as sanitary condition as possible, as bad hygienic surroundings might be stated as a cause.

Concerning broken wind as a disease of setting aside a contract or sale, I cannot find any work that gives any information from the legal standpoint in this country. As to setting aside a contract or sale in regards to development of heaves within a certain time if purchased, such is considered in Bavaria, Wurtemberg, Grand Duchy of Baden, Saxony, Austria, Switzerland and Duchy of Brunswick. I must confess I have examined horses that have in a comparatively short time showed distinctive symptoms of heaves. It is not an uncommon occurrence for a veterinarian to be called as an expert to give an opinion in regard to heaves. If there were some stated time as the above countries have settled upon, it would prevent differences of opinions. We

know old-fashioned heaves is a disease of some standing, and I think right here is an opportune time to get various views and come to some specified time.

#### TREATMENT.

This is more palliative than curative, and thorough knowledge of feeding is very essential; the natural tendency is persistent aggravation by judicious regimen. Many cases may be checked in their progress or even cured. It has been mentioned what turning out to pasture when grass is green, short and succulent will do in relieving the dyspnœa.

A limited supply of water will enable heavy horses to do ordinary work with comparative ease and comfort. Why this is so is due to the empty condition of the digestive organs. If a bronchitis is associated, that being relieved, good results will come forth. Great care should be given to the condition of the feeds. Many farmers' horses are affected with broken wind due to the fact that they sell the best quality and feed the inferior to their own horses. Baled hay in many cases may lead to trouble due to the way it is pressed. Anything and everything is sometimes put in during pressing to increase its weight or to sell worthless stuff at hay market prices. Now, for this reason, owners of horses who cannot feed anything but such hay should see to it that the product is well looked over before feeding. Dr. Law says to moisten it with some saccharine agent as molasses will be helpful. Arsenic is a remedy which has been used as early as the first century of the Christian era. *Grindelia robusta* fluid extract is a very good agent. The virtue is, no doubt, due to its action on the bronchi; in relieving the chronic irritation, it will check the cough, if not entirely stop it. Hutyra in his latest edition mentions a combination of drugs which is called Bergotinine, a French preparation that is well worthy of trial. I have seen great results from its use. It is purchased through Pasteur Laboratories. Its only fault is, it is expensive.

Unscrupulous dealers do not hesitate to avail themselves of a variety of devices to conceal the symptoms of broken wind so

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as to deceive the novice, and some of them are so shrewd that they make it rather unpleasant for a veterinarian in an examination of soundness. But the veterinarian, being conversant with their methods whereby such conditions can be produced, he can take the precaution to ward off any scheme they have in view, much to his credit and the chagrin of the dealer.

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AN OUTBREAK OF HOG CHOLERA IN CANADA.—“For at least six weeks the most serious outbreak of hog cholera that has developed in the Canadian West has been rapidly spreading in the vicinity of Winnipeg, and for a great part of this time without the authorities being notified. Even now that the extent of the disease is known, little co-operation is given Dr. C. D. McGilvray in his efforts to bring this outbreak under control.

Perhaps a great deal of this apathy on the part of the farmers is due to lack of knowledge of the seriousness of this disease and of the government regulations concerning it. In passing, it may be well to note that it is one of the most contagious and fatal diseases among live stock, scarcely ever attacking a piggery but what ninety to one hundred per cent. of the hogs become affected with fatal results.

Already within the affected area hundreds of hogs have died or have been slaughtered in an endeavor to stamp out the disease, and yet partly due to the wet weather and the indifference of the farmers the disease is still spreading. To those in the vicinity of the affected area it may also be well to note that under the Health of Animals Act of the Dominion of Canada any one who harbors any animal having a contagious disease—among which is hog cholera—without notifying the proper authorities, is liable to prosecution. Now, while the authorities have shown every consideration to the farmers in this respect owing to the disease not being well known, it may be necessary to use more stringent methods unless those in the vicinity of the outbreak show a greater interest in assisting to control the disease. \* \* \*”—  
(*Farmer's Advocate—Winnipeg.*)

## INFECTED FLEXOR TENDON SHEATHS AND BURSAE OF THE HIND LIMB.\*

BY R. W. GANNETT, D.V.M., BROOKLYN, N. Y.

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There are several flexor tendon sheaths and synovial bursae on the horse's hind limb which occasionally become the seat of acute purulent synovitis.

The navicular bursa interposed between the fan-shaped termination of the flexor pedis perforans tendon and the navicular bone is most frequently involved. Next the sesamoid sheath, extending from the lower fourth of the canon to the heel through which glide the tendons of both flexors of the foot.

At the hock, where the two flexors of the foot have a separate synovial apparatus, is the sheath of the flexor pedis perforans tendon extending from a level with the summit of the os calcis through the groove on the inside of the hock to the upper third of the metatarsus. Also the bursa of the flexor pedis perforatus tendon which facilitates the gliding of the tendon upon the point of the hock. This bursa extends from the lower fourth of the tibia to about three inches below the summit of the os calcis.

A deep punctured wound at the frog is the usual cause of infection in the navicular bursa. The condition is most successfully treated by the operation of resection of the flexor pedis perforans tendon by which diseased tissue is removed and disinfection made possible, but, more than that, absolute rest is secured for the parts involved. The tendon no longer glides painfully over the navicular bone, and though only a portion of the navicular bursa is removed, no more purulent synovia is discharged. Healing is rapid and recovery to usefulness assured.

Acute purulent synovitis of the sesamoid sheath occurs as a result of wounds and as a complication in local infections of

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the fetlock and pastern. I must confess that we have had but little success in treating this condition. We have persevered with antiseptic irrigation and daily injections of tincture of iodine. In one case the perforatus tendon was slit on its median line from the ankle to the heel. In another we followed Bier's treatment by elastic ligature. As a last resort on a horse still in the hospital we performed tenotomy of both flexor tendons at the cannon. The animal has improved considerably. The synovial discharge has decreased and he is placing considerable weight upon the limb, but the outcome is uncertain.\*

Out of a total of about twelve cases we have seen but one recovery which took place after a table operation by which the sheath was laid open on each side at the ankle. The wounds were thoroughly irrigated with antiseptics; an iodine seton was also inserted through the sheath and left in place eight days. Lameness, which had never been severe, gradually subsided and recovery was complete in six weeks. I am not prepared to say what can be accomplished by tenotomy in treating purulent synovitis in this sheath if performed early. The subject of our single attempt was already in a critical condition when tenotomy was performed.

Acute purulent synovitis of the sheath of the perforans tendon at the hock sometimes follows kicks and other injuries. It also occurs as a complication in local purulent infections. Prognosis under ordinary treatment is unfavorable. I believe, however, that in tenotomy combined with drainage and the usual antiseptic treatment we have a method that promises some degree of success. I mentioned the fact that after resection of the plantar aponeurosis although only a portion of the navicular bursa is removed, there is no longer purulent synovial discharge because friction upon the remaining synovial membrane is eliminated.

The same principle applies at the hock. When the tarsal sheath of the flexor pedis perforans tendon is open and infected,

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\* A secondary abscess formed directly in front of the fetlock and terminated in an open metatarso-phalangeal articulation. The horse was destroyed.

there is a constant discharge of purulent synovia and severe lameness. If we perform tenotomy of the tendon involved, the toe will turn up slightly, but in our experience much more weight will be placed upon the limb. The synovial discharge will gradually cease and become more purulent in character and recovery will follow with drainage and antiseptic treatment.

Our first experience along this line occurred about four years ago. On January 4, 1907, a bay horse was sent to the hospital in an ambulance. The animal hopped on three legs. The entire hock was badly swollen, but showed no external wound. Temperature was  $104^{\circ}$ . After saturating the hock continually with antiseptics for a week, a blister was applied, after which the patient's condition became so bad that we obtained the owner's consent to have the animal destroyed. As an experiment, however, he was secured upon the operating table with the diseased limb next the table. The sheath was slit open for about five inches and a large quantity of purulent synovia escaped. Relief was immediate, but we now had a gaping wound on the inside of the hock. It was interesting to watch the tendon gliding up and down in its groove, but because of this motion and the synovial discharge the wound refused to heal. As a last resort, tenotomy was performed at the operative wound, and about four inches of tendon was removed; consequently this tendon never united, but an uneventful recovery followed. The patient was discharged March 4 and was soon hauling coal, showing no lameness, but a certain lack of control of the foot when advancing the limb. For purulent synovitis of the tarsal sheath we would perform tenotomy early, at the middle of the canon, away from the infected area, instead of within the drainage wounds at the hock. In this way perfect rest is secured for the structures involved and the divided tendon eventually unites.

The bursa of the superficial or flexor pedis perforatus at the hock becomes infected occasionally as a result of injuries. Sometimes lameness is not severe and recovery occurs under antiseptic treatment; at other times the condition becomes serious because when the entire sheath is filled with purulent synovia

it is difficult to provide adequate drainage for the constant secretion. This sheath must not be slit open at the summit of the os calcis, as in so doing one of the lateral branches is severed; the tendon will then slip off the point of the hock and the case becomes hopeless.

A heavy draft horse was kicked June 1 just above the seat of curb. There was soon a copious discharge of purulent synovia. The original wound was enlarged, syringed thoroughly and bandaged. The horse was tied short and the dressing kept saturated with a 1-1,000 solution of bichloride of mercury. This treatment being continued for one week with no improvement, the patient was sent to the hospital in an ambulance and dressed daily for another week. He was now in a serious condition, very lame and rapidly losing flesh. Temperature 103° F. We decided to perform an experimental operation. The patient was given a full dose of chloral and secured upon the operating table. Tenotomy of the flexor pedis perforatus tendon was performed in the middle of the canon, drainage being provided by inserting a large seton the entire length of the sheath. An uneventful recovery followed. In four weeks the animal walked home, a distance of five miles, and in seven weeks was moving soundly at a trot.

We have had an insufficient number of cases of like nature to warrant positive conclusions as to the efficiency of this method, but thus far our results have been very encouraging.

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DR. RAYMOND C. REID, Elmira, N. Y., has been appointed Professor of Veterinary Science and Bacteriology in the Delaware State College.

DR. HARRY H. HAVENER, Corrydon, Ia., graduate of the Division of Veterinary Science, Iowa State College, has been appointed Assistant Professor of Animal Husbandry and Veterinary Science at the Veterinary Department of the University of Pennsylvania.

## SAND AND CINDERS IN HOG LIVERS.

BY A. T. KINSLEY, M.Sc., D.V.S., KANSAS CITY, Mo.

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It is not unusual to find various foreign substances in the stomach or intestines of cattle, goats, sheep and hogs, and in some localities it is not uncommon to find accumulations of sand and vegetable fibre in the digestive tube of the horse. The accumulation and retention of particles of mineral matter in the lung tissue and related lymph nodes is rather common in animals that are used in cement works, coal mines, street sweeping and other like occupations. It is rather unusual, however, to find quantities of foreign material in the liver.

Several hog livers have been observed that contained quantities of sand or cinders varying from 30 c.c. (1 ounce) to 1,000 c.c. (1 quart). These cases have all been observed in hogs killed in abattoirs, and without exception the animals were in prime condition.

The gall bladder is located on the posterior surface of the liver, being attached to the right central lobe. The hepatic duct emerges from the portal fissure and joins with the duct leading from the gall bladder (cystic duct) at an acute angle. At the junction of the hepatic and cystic ducts, the common bile duct (ductus choledochus) has its origin, and it continues posteriorly and slightly to the right, terminating in the papilla duodeni about  $1\frac{1}{2}$  inches from the pylorus. The duodenal papilla is a hollow conical elevation of the duodenal mucosa having a small opening at the summit through which the bile is discharged. All of the larger efferent bile vessels, *i. e.*, the hepatic, cystic and common bile duct are lined with simple columnar epithelium, with an occasional goblet cell which rests upon an elastic basement membrane outside of which is a submucosa, and this in turn is surrounded by an irregular circular layer of involuntary

muscular tissue. Encircling the muscular layer is a fibrous and serous tunic. In the cystic duct a spiral valve due to an irregular folding of the mucous membrane has been described by some authors.

The secretion of bile is practically continuous, but it is, according to most physiologists, discharged periodically, at least in animals having a gall bladder. The discharge of bile is effected through the action of the muscular tissue of the bile ducts and gall bladder and the relation of the sphincter muscle located at the base of the duodenal papilla. The bile secreted during the interval between the periods of discharge is accumulated not only in the gall bladder, but also in the bile duct, and, further, it is possible that reverse peristalsis may occur in the common bile duct, thus overcoming the resistance of the spiral valve and forcing the bile that had accumulated in the common bile duct into the gall bladder. It is supposed that the hepatic duct has a more resistant valvular arrangement, thus preventing a reflux of bile into it, at least until the gall bladder and common bile duct are gorged to a sufficient extent to overcome the resistance of the valve in the hepatic duct, after which bile may be forced back through the biliary tubes in the liver, the reabsorption of which is the common cause of icterus.

Hogs, generally speaking, consume foreign substances of most every description, and they have frequently been observed to ingest enormous quantities of sand, cinders or coal whenever opportunity permits. The source of the sand and cinders in the livers examined was no doubt through the bile ducts. In every case the common bile duct was found gorged with the foreign material, the duct in some instances being more than one inch in diameter; the cystic duct and gall bladder were found to contain varying quantities of the foreign substances. In one instance the gall bladder was so engorged with sand that it had dilated until it was fully as large as a quart measure. The hepatic duct was apparently the last invaded in all cases, though in many instances cinders and sand have been found in some of the smaller biliary tubules. The gross appearance of the

affected liver necessarily varies according to the quantity of foreign substance accumulated. The bile duct, and frequently the biliary tubules, are dilated and their walls atrophied; in many instances a fibrous tunic of variable thickness alone encases the foreign substance. The accumulated mass in the bile ducts and gall bladder has obstructed the outflow of bile and thus there is icterus of varying intensity. There is usually some catarrhal disturbance of the mucous membrane of the duodenum.

Just how the foreign substances gain entrance and "back tells" in the bile tubes has not been determined. The orifice in the summit of the duodenal papilla probably becomes enlarged through injury or atrophy of the surrounding mucosa, and this, in conjunction with a full stomach and more or less full intestine, would facilitate the passage of sand through the orifice and into the cavity of the papilla and possibly into the common bile duct. The accumulated sand or other foreign material probably becomes an irritant and the sphincter muscle relaxes, thus permitting the solid matter to pass on into the common bile duct. In the common bile duct reverse peristalsis would convey the foreign substance to the gall bladder. The large quantities accumulated in some cases could be accounted for only on the supposition that the affected hog had frequently consumed large quantities of foreign substances, and no doubt in such cases the papillary orifice becomes permanently enlarged and the sphincter destroyed or its action overcome so that the foreign material may reach the common bile duct with little resistance. It is difficult to understand why the peristalsis should become normal and force the foreign material out of the gall bladder, cystic and common bile ducts, and this is suggestive of the fact that there is disturbance of the nerve supply to the bile tubes and intestinal wall, and it is possible also that the entire cause of the accumulation of this material in the liver is due to some irregular action of the intestinal musculature.

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THE Terre Haute Veterinary College has registered about seventy-five freshmen this autumn.

## BOVOVACCINE.

BY DR. WILFRED LELLMANN, PROFESSOR AT THE NEW YORK UNIVERSITY.

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A few more facts about good results with the continued use of bovo vaccine at two farms may be of interest for professional men who have been using bovo vaccine for years with proper judgment and accuracy.

On those two farms, 125 calves have been vaccinated within the past seven years; none of these vaccinated animals has reacted so far on tuberculin test. It certainly speaks well for the method, as nobody, even antagonistic to bovo vaccine, could pretend that this has been merely a lucky coincidence, especially when I state that there had always been a larger or smaller percentage of tuberculin-reacting animals.

Of those vaccinated animals, 104 have been more or less under my personal observation, and a large number of these were vaccinated by myself.

I wish to emphasize again that bovo vaccine has been abused in a great many ways. Bovo vaccine should be used with proper judgment and painstaking accuracy. I am sorry to state that these two qualities lack in a great many practitioners; however, they are always ready to express their opinion and to make pretensions which stand on a positively shaky basis. Furthermore, there are many professional men who speak about bovo vaccine as to its value without having given the matter the slightest test. One can easily comprehend the possibility of bringing about the most dissenting opinions.

I feel sure that practitioners who have given bovo vaccine the proper test for a continued number of years, with proper judgment and care in all its details as to its use, will reap the benefit of it.

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I repeat once more what I have stated time and again: In order to get good results from bovo-vaccine, we must always bear in our minds the following points when using bovo-vaccine:

1. Selecting perfectly healthy calves, not over 4 months old; from 3 weeks to 4 months is the best age.
2. Making the intravenous injection accurately and carefully in every regard, strictly covering the directions as to its use.
3. Keeping the vaccinated animals isolated from possibly infected ones, *i. e.*, those which showed doubtful reaction on tuberculin test, for at least a period of six months after vaccination.
4. Using good judgment as to the surrounding sanitary conditions. Much can be done in this regard by using common sense, without going through a great expense.
5. Vaccinating all the young stock which is kept on the grounds for either breeding or dairy purposes.

I know perfectly well that many dairymen and farmers, as well as practitioners, have not the energy and push to go about a thing with the necessary care, and it is due to that, more than anything else, that they give up sooner or later instead of sticking to it.

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DR. A. W. PFARR, Pittsburgh, Pa., has opened a new veterinary hospital and is doing considerable sanitary work.

DR. CHESTON M. HOSKINS (U. P., '11) is associated with his father, Dr. W. Horace Hoskins, in connection with the practice of the Philadelphia Veterinary Sanitarium at Nos. 3452-4 Ludlow street, Philadelphia.

DR. JAMES A. WAUGH, Pittsburgh, Pa., reports prevalence of cerebro-spinal meningitis or forage poisoning in city and country, in Western Pennsylvania. The doctor states that out of twenty cases which he saw, only one recovered.

"CAN you tell me where I can buy a horse?"

"I think Deacon Skinner has one to sell."

"What makes you think so?"

"I sold him one yesterday."—(*Rider and Driver.*)

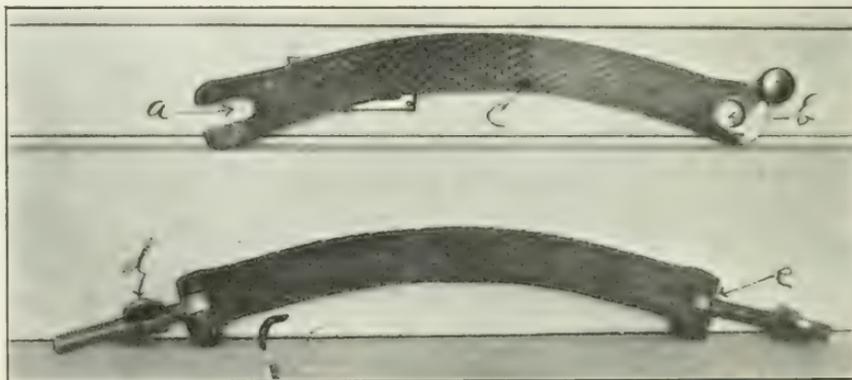
## REPORTS OF CASES.

### RADICAL OPERATION ON A CASE OF INFECTED UMBILICAL HERNIA.\*

By A. A. HERMANN, D.V.S., Littleton, Colo.

The patient was a percheron horse weighing 1,000 pounds.  
Age 18 months.

*History.*—Hernia was present at birth, and when six months of age was as large as a goose egg. An illegal practitioner insisted that it should be operated on. He cast the colt and proceeded to enlarge the hernial opening anteriorly and posteriorly to a length of about six inches. He said he did this so he could "get his hand in and sew outwardly." By accident the colt became unmanageable and had to be caught and recast. The exposed viscera were washed and replaced. Four sutures with num-

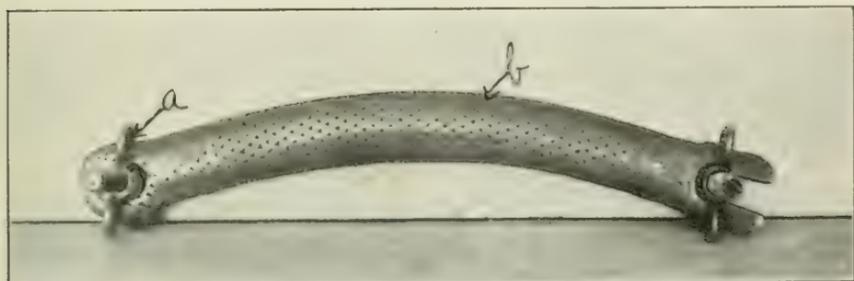


CUT 1.

ber six twisted silk were made to unite the margins of the tunica abdominalis. Five more sutures united the margins of the skin. The latter sutures soon sloughed leaving an elongated wound. The former, probably by inflammatory processes, tore through the one or the other side of the abdominal tunic and remained

\* Read before the Colorado State Veterinary Medical Association, June 3, 1911.

imbedded therein. The abdominal enlargement then became about the size of a child's head and presented, on its inferior aspect, four openings of fistulous tracts. The owner again called the imperic, who advised daily insertions of crystals of copper sulphate. For about nine months the owner persisted in this treatment. To no avail but to keep the colt in agony.



CUT 2.

I was called March 10, and examined the hernia and found that the lower portion was dense fibrous tissue and the upper portion was viscera. With pressure from below the entire mass could be forced up into the abdominal cavity.

March 12, colt was brought for operation and placed on a diet for two days to prepare him for the operation. Cultures were taken from the fistulae and sent to Dr. B. F. Kaupp, pathologist of the Division of Veterinary Medicine, Colorado State College, for the purpose of making an autogenous vaccine.

Believing that sutures would be impractical I made an effort to secure a strong clamp at least eight inches long. Failing therein, I purchased two 10-inch half-round wood rasps and induced a blacksmith to try and make a clamp. The rounded surfaces were made smooth on an emery wheel (see b, cut 2). All work was done carefully to preserve the sharp teeth on the flat surface (see c, cut 1). A bolt was hinged on at each end of the rasps (see a, cut 3 and e, cut 1). One bolt passed through a circular hole in the opposite rasp (see b, cut 1), and the other bolt worked through a slot to permit a hinge movement of the clamp (see a, cut 1). Thumb screws made it easy to adjust and tighten (see d, cut 1, a, cut 2 and b, cut 3),

In preparing to operate the area was shaven, dried with alcohol, and painted with tincture of iodine. The colt was cast on a canvas, saturated with a solution of formaldehyde, and then an-

esthetized with chloroform. An oval skin incision three by five inches was made around the fistulous and fibrous mass, the underpart was dissected with the aid of a scalpel, curved scissors and numerous hemostats. It was swabbed continuously with adrenalin chloride solution. After the enlargement was removed *en masse* the opening through the peritoneum disclosed what appeared to be the point of the cæcum. The fistulæ in each case extended to a knotted piece of silk which appeared to be surrounded by greenish-cheesy pus. Close to the margin of the wound I passed four sterile meat skewers through the skin and through the tunica abdominalis, then across to the point directly opposite and in a similar manner forced the points from within



Cut 3.

to the exterior again. Above these skewers and by traction on the abdominal walls at either side I adjusted and tightened the clamp. Thus an oval opening four inches was closed with tissue to spare. The anesthetic was withdrawn and soon the colt was staggering about in its delirium which was perhaps, for the most part, due to the grain of cocaine applied locally to make the operation even less painful. Soon the colt found itself confronted by a high board fence having each board pointed-picket-like. In a moment the animal reared and plunged into the air, coming down upon the fence, here it hung a second or two, caught by the clamp and then, the fence being weaker, broke and released it. Luckily the position of the clamp was unchanged as the meat skewers were left in beneath it.

Next day, while I was attending another case, the colt showed signs of collapse, leaning against the barn and trembling. My wife hurriedly gave  $\frac{1}{2}$  grain strychnine hypodermically with 10 c.c. nuclein solution. No symptoms of peritonitis appeared and no further treatment was necessary. A week after operating the

clamp dropped off, leaving a smooth pink dry wound level with the belly line. A severe attack of strangles, which was treated with strangles vaccine made by Dr. Kaupp, has not retarded the healing of this wound left by the clamp.

Recovery was complete.

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## SOME INTERESTING CASES.

By GERALD E. GRIFFIN, Veterinarian, Third Field Artillery, U. S. Army, Fort Leavenworth, Kansas.

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### LACERATION OF BLADDER.

A mare, bay, 15.1 hands, 16 years old, 1,000 pounds, brought to hospital with history that she had been straining and passing blood for nine days. She had, since yesterday, refused food and water.

Exploration revealed some hard substance in bladder. It was abstracted, a splinter of yellow pine  $8\frac{1}{2}$  inches long, about one inch thick, blunt at one end and pointed at the other. The blunt end was directed toward the neck of the bladder and had lodged itself in the mucus membrane to the right of the sphincter.

The pointed end directed itself to the vertex of the organ and had apparently penetrated the mucus membrane there. A considerable quantity of blood, pus and mucus membrane was discharged immediately after removal of foreign body. Anodynes and mild antiseptic washes were used. Patient appeared to improve for four days, although there was much sloughing of mucus membrane, and the temperature kept to  $103^{\circ}$  F. On fifth day after removal of foreign body patient did well and temperature subsided to  $102^{\circ}$  F. and remained there.

Immediately after dressing on morning of sixth day, animal lost control of right pelvic extremity, suffered with colicky pains and appeared in great distress that did not respond to hypodermic medicament. Patient died after three hours. The temperature previous to death being  $104.4^{\circ}$  F., pulse 87, respiration accelerated, mucus membranes (visible) highly congested, mouth hot and dry; while loss of muscular control had extended to left pelvic limb.

Post mortem revealed intense and extensive inflammation of entire fundus and vertex of bladder, right ureter, and right kid-

ney. There was observed a gangrenous patch on spot where blunt end of splinter had pressed. The pointed end of splintered stick had penetrated the mucus and muscular walls of vertex, leaving in the vicinity much inflammation, pus and broken down tissue.

The left ureter and the pelvis, and a portion of the parenchyma of left kidney showed evidence of inflammation. All of the other viscera appeared normal.

The degenerate who introduced the splinter was not discovered.

#### FRACTURE OF OCCIPITAL PROTUBERANCE.

A grey gelding, 16 hands, 8 years, 1,100 pounds, was brought to the hospital suffering with a stiff neck and two large swellings, one on each side of ligamentum nuche, immediately posterior to ears. Owner said that swelling on right side had persisted for 13 months. The one on left side had appeared about 3 months previous to visit.

He requested a cure. Animal would not permit a manual exploration until secured in stocks.

Ten inches posterior to occipital crest and exactly on the median line a decided depression was observed. On right of this depression and about four inches from ear a large, painful, fluctuating swelling was noticed. On the left side, in about the same relative position, a second painful, fluctuating but smaller swelling was exhibited. The animal resisted manual exploration.

On exploring, with the hand, the occipital region, the patient struggled so violently that the head rope of the stocks slipped forward and pressed so hard on the diseased parts that the left swelling ruptured and discharged about six ounces of pus, which was mixed with shreds of broken down tissue.

An incision was immediately made into the swelling on the right side and through its thick walls about four ounces of a semi-solid pus was evacuated; both cavities were now explored, cleansed and dressed.

There being no improvement after two weeks of temporizing and daily dressing, operation was decided upon.

On exposing the funicular portion of the nuche for ten inches nothing of a pathological character was discovered, except that the ligament appeared to be flacid. On moving anteriorly it was found that the entire occipital protuberance was loose from the bone. This was removed, the end of the ligament trimmed, the

ragged part of bone curetted, a drainage tube inserted anteriorly; parts sutured and dressed. Patient made a recovery in three weeks from date of operation.

The veterinarian is not justified in deferring operation on diseased poll or withers of long standing.

#### PARALYSIS OF TAIL.

Bay gelding, 15 hands, 14 years, reported to have suddenly lost power of using tail. Was all well preceding day, but this morning he couldn't use tail and was "groggy" behind.

No history of blow or fall or other injury.

After six weeks of various lines of treatment, tail remains paralyzed, "grogginess" disappeared early. On exploration externally and per rectum, a sensitive spot was discovered on sacrum near to portion where it articulates with the coccyx.

After four weeks it was learned that the horse, while being shod, was hit by the blacksmith with a rasp on "root of tail."

History received with army cases is usually unreliable.

No recovery in this case.

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### FOREIGN BODY IN THE PARANASAL SINUSES AND ITS OPERATIVE REMOVAL.

By FRANK T. KENELEY, V.S., Twin Falls, Idaho.

This case is reported because it has been somewhat of a surgical curiosity to me.

A four-year-old mare entered the hospital for treatment, very much emaciated and having an abundant, thick, viscid, discharge from both nostrils, and a swelling commencing at a point in front of the anterior end of the facial crest, extending upward and backward, involving the greater part of the external surfaces of the superior maxilla, nasal, molar and frontal bones. Percussing these respective sinuses showed an entire loss of resonance. An examination of the mouth with the aid of a speculum revealed a diseased fourth molar.

The owner said this animal had commenced to lose flesh four months previous, and about this time he noticed a light discharge from one nostril, closely followed by a swelling near the anterior end of the facial crest; only lately had he noticed a discharge from both nostrils.

The animal was placed on the operating table, the mouth speculum adjusted, and after preparing the operative field a three-quarter inch trephine opening was made one inch above the anterior end of the facial crest. After removing the circular plate of bone and arresting the hemorrhage, the sinus was explored for pus, but instead it was found firmly packed with masticated hay. Using the finger as a probe, search was made for the oblique septum dividing the two compartments of the maxillary sinus, but as far as the finger could reach nothing but hay was encountered.

A part of the hay was removed from the anterior compartment, the punch adjusted over the root of the fourth molar, and it was pushed out of the alveolus into the mouth in two sections. An examination of the tooth showed the central part missing, which had left an opening into the sinus, allowing the hay to pass up into it. After removing the small fragments of tooth in the alveolus, the sinus was explored to find the extent of the impacted hay, which was found to entirely fill the maxillary sinus. A second opening was made near the junction of the maxillary and frontal sinuses, and by the aid of a curved punch the impacted mass was pushed down toward the alveolus and a punch in the first opening directed it into the month; after removing the greater part of it this way, I found that the mass still extended above my last opening, necessitating a third opening into the frontal sinus, the interior of which was found filled with hay and pus. This was the first place I had encountered pus. The septum between the two sinuses was intact and percussing over the opposite sinus a clear resonance was evident and it was not opened. With a curved punch the mass of hay was slowly pushed into the mouth and the cavities flushed with a two per cent. solution of creolin, and the opening into the mouth closed with a cotton plug.

In dressing the cavities the following day, they were found free from any hay; they were irrigated with a two per cent. solution of creolin and all drained well except the frontal sinus. By the aid of a flexible probe a gauze seton was passed from the opening in the frontal sinus down through the opening over the fourth molar and the two ends tied over the side of the face, and it gave no more trouble as regards drainage; the wounds received daily irrigations and each time the opening into the mouth was plugged with cotton.

In addition to the above treatment the animal received the polyvalent-bacterin, the increasing dose ampules were used at four-day intervals. Two days after the first injection, the discharge was greatly increased in all the openings and after the second injection the nostrils had no indication of running pus, neither did they commence again during the healing process. The sinuses also contained less pus after the second injection and from this on the wounds healed quickly with very little discharge. The animal's general condition seemed greatly improved by the use of the bacterins.

The animal left the hospital sixteen days after the operation; the sinuses had all healed and there was only a small opening over the fourth molar into the mouth; her general condition had also greatly improved. By the use of the bacterin the healing process was made much shorter in this case.

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## INFECTIOUS ANEMIA?

By HORACE B. F. JERVIS, V.S., Houlton, Me.

In making this report I may say that I have nothing new to give upon this condition, but am in reality reporting it, hoping that by so doing I may get a little information from some of the REVIEW readers.

This case, owing to great distance, was only seen once, and no chance was had to do an autopsy. On September 15 I received a call from the owner of this mare asking me to come and attend a horse that was very sick. On arrival I found a mare, weighing about fourteen hundred pounds, nineteen years old, very emaciated, and on a casual examination showing a general condition of malaise. Temperature subnormal, pulse typically anæmic, visible mucous membranes of a dirty yellow color. The mare showed great weakness and staggered when made to move, and large œdematous swellings were present in dependant parts. The sphincters were all relaxed, the thermometer having to be placed well back in the rectum in order to register at all. Urination was constant and profuse, presumably from relaxation of cystic sphincter. The mare was eating as heartily as a well horse, in fact couldn't seem to get enough; completely cleaning up all that was put before her. She had a fine, vigorous sucking colt at her side.

The owner told me that two months previously he had lost a fine four-year-old colt, which exhibited just the same symptoms as this mare, and the disease ran a course just the same as this case. He said that in the event of his having any more of this, that he could with great ease diagnose it in the very early stages. The history that he gave was the following:

He first noticed a peculiar uneasiness, evinced by alternately resting first one hind leg and then the other. Next in order came quickened breathing, followed by polyuria, and in the case of the colt he lost, he was found dead in the pasture a month after the first symptoms were noticed.

This mare that I saw on September 15 was first noticed about August 20, and she died about September 30.

I happened to have my Thoma Zeiss with me and took some blood, and on arrival home made a count, the result being as follows: Red corpuscles, 3,000,000; leucocytes, 510.

I had a couple of slides with me and made smears. On undertaking to make a differential leucocytic count, I was surprised to find not a single leucocyte on either of my smears.

In regard to the red corpuscles, one found a typical picture under the microscope, viz.: microcytes, megalocytes, erythroblasts and poikilocytosis.

Having had no previous experience with infectious anæmia. I would be glad if some reader of the REVIEW who has would kindly tell me whether I am right in coming to such a conclusion in forming such a diagnosis?

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## A SERIOUS OUTBREAK OF ANTHRAX CHECKED BY STRICT QUARANTINE AND VACCINATION.

By Dr. W. W. YARD, State Veterinary Surgeon, Denver, Colo.

In the early part of July, four milk cows died suddenly upon the farm of a very rich mining man, situated in the Arkansas Valley. A young practitioner was called and could not decide the trouble; and upon autopsy, said it was some kind of forage poisoning. Most of the cattle on this farm were pure-breds. Deaths continued in both cattle and hogs until the owner, distracted, mentioned the fact to the local United States veterinarian, who made an examination and diagnosed anthrax; and then, on the 12th of August, notified me. We immediately

quarantined this farm, burned all carcasses and moved all stock to high pastures. While doing this, cattle on other farms began dying, the infection seeming to run east, the way of the Arkansas, until at last it had spread eleven miles, and, of course, necessitated the quarantining of each farm. I then employed a deputy sheriff, who rode this area from sunrise to sunset, seeing that whenever an animal having died reported, was burned. Warning signs were printed and tacked up on the highway, and all the cattle inoculated with the Pasteur anthrax vaccine twice, 12 days apart. After the second inoculation was made, the cattle ceased dying and none have died since August 28; although the disease promised to give us a very stubborn fight and was the severest outbreak ever seen in this state. One farm lost over \$6,000 worth of stock; but so effectual had the quarantine been, and the vaccination, that on September 22 I raised the quarantine on each farm whose cattle had been vaccinated properly; and with the ardent work of Dr. Stout, local Government veterinarian in this valley, the disease is to-day only a sad memory to those who suffered from it. But if Pasteur vaccine had not been discovered, a general outbreak could only have been the result of the vigor with which the disease spread.

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### A PROLIFIC COW.

By F. W. E. PENISTON, D.V.S., Smith's Parish, Bermuda.

On September 25 last, I was called to attend a Jersey cow that had given birth to triplets. In conversation with the owner, it transpired that she had given birth to triplets at the previous calving also, and was altogether a rather prolific cow. The first three times she had one calf each time, the fourth time she had twins, and the fifth and sixth times, triplets each time; making eleven calves in five years; eight of which were born in the last three years.

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THE Division of Veterinary Science, Colorado Agricultural College, has introduced into their clinic an X-ray. This is proving useful in examination of fractures of the bone in horses, dogs, etc., as well as in locating foreign bodies. The students are much interested in this new work.

## ABSTRACTS FROM EXCHANGES.

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### ENGLISH REVIEW.

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

CASE OF EQUINE TUBERCULOSIS [*W. Caudwell, F.R.C.V.S.*]  
—Unbroken draught filly has been grazing with others and was doing well when her breathing became abnormal and accelerated. Put in a box, it was difficult on account of her temper to make a minutious examination and her condition was diagnosed as one of pneumonia. She was put under treatment accordingly, but although she had fair appetite and received nourishing food, she lost flesh rapidly and died after about thirteen days of illness only.

At the post mortem the mesenteric lymphatic glands were enlarged and contained puriform fluid. Digestive canal nearly empty. Spleen had several yellowish nodules. Liver and kidneys healthy. Lungs enlarged, heavy with appearance of gray hepatization. Smears from the lungs, spleen and mesenteric glands examined under the microscope revealed large numbers of Koch's bacilli, establishing the tuberculous nature of the case, which was confirmed by Sir J. McFadyean.—(*Vet. Rec.*)

AN INDICATION IN STIFLE LAMENESS [*A. E. Bayley, M.R.C.V.S.*].—This is to call the attention to a peculiar position assumed by horses with lameness located in the stifle joint:

"It will be observed that there is knuckling of the fetlock joint, so much so that the end of the cannon bone very nearly rests upon the ground, and that the angle which normally exists at the flexure of the hock joint is nearly obliterated, causing the limb as a whole to approach the perpendicular. Once seen, one can readily differentiate this peculiarity from the perfect normal attitude, which it reminds one of, assumed by the horse when standing at ease; the chief difference being that in the latter position, the angle referred to, instead of being more obtuse, has become less than a right angle."

The record is illustrated by photo showing the above described position in a horse which was treated for lameness of the stifle by pyro-puncturing blister and long rest, with successful result.—(*Vet. Rec.*)

IMPACTION OF THE OVIDUCT IN A PIGEON—OPERATION—USEFUL RECOVERY [*A. W. Noel Pillers, F.R.C.V.S., and H. Thompson, M.R.C.V.S.*].—Valuable breeding flying homer hen was suffering with impaction of the oviduct due to an egg. Usual remedies have failed. The bird was carefully chloroformed and median laparotomy performed. Steady pressure was applied to the outside of the oviduct behind the egg, but as there seemed to be no prospect of succeeding in moving it, the dilated duct was incised longitudinally over the impaction and the egg popped out into the abdominal cavity and thus removed. The incised duct could not be found, so it had to be left as it was and the abdominal wound was closed with continuous suture. Recovery in some seven days. The bird since laid a normal egg.—(*Vet. News.*)

GRASS-SEED ABSCESSSES IN THE PHARYNGEAL AND SUBMAXILLARY REGIONS OF CATTLE [*Max Henry, M.R.C.V.S.*].—Cattle were reported as affected with manifest tuberculosis and were isolated. Four cows indeed showed evident thickening of the throat with localized enlargements of the pharyngeal and submaxillary regions. Those were considered as tubercular lymphatic glands. The cattle were in good condition. The swellings varied from a thickening of the skin to a round mass freely movable. Some had the aspect of a slowly maturing abscess. Their external appearance did not indicate either tubercular or actinomycotic enlargements. Punctured, they gave liquid thin pus of a dirty white color and having fœtid odor. In the pus were grass seeds. Some of the animals had died, and the post mortem showed that the condition was caused by the sharp-pointed and barbed grass which through the mouth had pierced their way into the underlying tissues, causing suppuration.—(*Vet. News.*)

THE USE OF ADRENALIN IN THE TREATMENT OF LAMINITIS [*Lieut. R. F. Bett, A.V.C.*].—The record of two cases of this trouble which occurred in about similar conditions and presented identically the same symptoms. The treatment of one

consisted in taking the shoes off, allowed a laxative diet, gave aloetis purge and prescribed cold irrigations over both fore coronets. Half an hour with forced exercise was also given. Besides these, adrenalin was injected over the plantar region on either side of both forelegs, which were renewed the following day. Great improvement was manifested on the second day of treatment and recovery sufficient to allow work after a week laid up. The second case was treated exactly like the first with the exception of the injection of adrenalin. The result was that the recovery was very much shorter, but that several weeks were necessary before the horse could resume work.—(*Vet. News.*)

UNUSUAL FOETAL PRESENTATION [*Erin*].—A mare was delivered of a dead foal with the following strange presentation: Head protruding through the anus and the fore legs through the vulva. There had taken place a rupture of the posterior portion of the rectum, of the anus, the sphincters and together with complete obliteration of the septum between the rectum and anus and the vagina and vulva, with severe laceration of the vaginal walls. Feces dropped in the uterus. Case considered hopeless; mare slaughtered.

In another case the foal was alive. The presentation was similar; the head was returned in its normal position and the foal delivered without trouble. Rupture of the septum between rectum and vagina was found, nine inches long. After cleansing and irrigation, the wound was closed with continuous suture. Weak solution of chinisol was injected twice a day and sloppy diet allowed. Recovery was uneventful.—(*Vet. Rec.*)

RUPTURE OF THE DIAPHRAGM AND STRANGULATED DIAPHRAGMATIC HERNIA [*Lieut. H. A. Stewart, A.V.C.*].—A mule exhibits ordinary symptoms of colic. The temperature is 102.2° F.; pulse wiry. Has some borborygms. Aloes and chloral are given. Two hours later chloral has to be renewed as pains are persistent. The following day convalescence seems at hand except little anorexia remains, and mucous membranes are injected. On the evening of the day after, the mule lays down and in less than five minutes dies without a struggle. Post mortem revealed slight peritonitis, diffuse inflammation of the intra-abdominal viscera. In the muscular portion of the diaphragm on the right side there is a rupture six or seven inches

long through which protruded fourteen and a half feet of small intestines. This occupied the bulk of the thorax, was in condition of acute strangulation, and was empty. Both lungs were congested.—(*Vet. Journal.*)

IMPACTION OF THE INTESTINES—PASSAGE OF AN INTESTINAL CAST EIGHTEEN INCHES LONG [*Capt. A. J. Williams, F.R.C.V.S., A.V.C.*].—The detailed account of the case of a cob which was under treatment for colic. The case was very tedious, and for fourteen days there was practically no action of the bowels notwithstanding the repeated administration of aloes, eserine, linseed oil, chloride of barium—chloral, ether: morphine being also given to relieve the pains. Stimulating treatment was also resorted to, and finally on the morning of the fifteenth day there was found hanging from the rectum a dark, stringy mass about two feet long. This was a cast of the intestines in a gangrenous condition. About half an hour after more feces were passed, and from that time the animal began to improve. His progress was slow. During his convalescence he was taken suddenly lame in one of his forelegs (the off), but ultimately the recovery was perfect and the animal resumed his regular work.—(*Vet. Journ.*)

FRACTURE OF THE TIBIA [*W. Caudwell, F.R.C.V.S.*].—A nag mare being driven home slips badly and becomes suddenly very lame on the near hind leg. No evidence of pain is detected except in the hock, which has an old bone spavin. As the mare is advanced in foal, she is let loose in a box stall and hot fomentations prescribed. The next morning she has fracture of the tibia with displacement. On post mortem there was found a comminuted fracture extending across the grooves and malleoli and half way up the shaft of the bone. There was also an oblique fracture extending from the upper part of the ridge of the bone in an oblique direction downwards and backward, with some intermediate smaller fractures.—(*Ibid.*)

THREE CASES OF ABNORMAL RETENTION OF THE FOETUS [*By the same*].—In a first case, a Jersey cow was expected to calve a month before the writer saw her. As there was no indication that she was to deliver, she was put under observation, and it was only twelve weeks after the normal time of gestation had expired that the cow ejected two mummified foetuses in their membranes.

In the second case, a Jersey cow had been expected to calve three months previously. There was no indication that labor would set in, although she was straining severely. She was relieved by treatment. A week after she was covered and the same afternoon she expelled a mummified fœtus, dead evidently since a long time.

In the third case, it was a mare which, while turned out in a meadow showed signs of foaling and soon gave birth to a fully developed dead foal. In the same meadow there was found the fœtus of a small equine which had died apparently about the seventh or eighth month of gestation. It was supposed that the mare had given birth to both fœtuses as she was the only pregnant mare on the farm.—(*Vet. Journal.*)

REMOVAL OF BOTH ABDOMINAL TESTICLES FROM A CRYPTORCHID THROUGH ONE INCISION [*Prof. F. Hobday, F.R.C. V.S.*].—Case of a cryptorchid colt in which it was possible to remove both testicles through only one incision made in the usual way. The removal was made without difficulty and by this method were the chances of wound infection so much reduced.—(*Ibid.*)

A CASE OF HODGKINS' DISEASE [*By the same*].—Small Japanese bitch had fits of weakness. The glands of the neck and behind the jaw were swollen but not painful. A month later the glands of the groin and axilla became swollen also and soon reached the size of a Barcelona nut. The diagnosis of Hodgkins' disease was made and the dog destroyed. The post mortem made by Sir John McFadyean confirmed the diagnosis.—(*Ibid.*)

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## FRENCH REVIEW.

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

FRACTURE OF THE TRACHEA—DIAPHRAGMATIC HERNIA—DEATH BY ASPHYXIA [*Mr. Floriot, Army Vet.*].—*Nikita*, a sixteen-year-old mare, has been suffering with roaring for a long time, but was still able to do her work until one day she was suddenly taken with an acute attack which threatened suffocation. At the base of the neck, on the anterior face, there is quite a large swelling, pressing against the entrance of the chest.

It has a tendency to invade the right jugular groove. It is very painful, not crepitating, and the slightest pressure on it promotes roaring. There is no mark of a wound on the skin, circulation is normal as well as the respiration when the animal is at rest. Walking brings out the roaring after a distance of twenty meters, and ten meters further the mare refuses to go on. The difficulty of breathing is very great, when the mare is very uneasy, scrapes the ground with her feet, the nostrils are widely dilated and soiled with bloody discharge, mouth is widely open, asphyxia is imminent. Ten minutes of rest bring comparative comfort. Placed on observation, *Nikita* has a bad spell one afternoon and dies.

*Post Mortem*—Subcutaneous tissue of the base of the neck is infiltrated. The trachea close to its entrance in the chest is wide and flattened. There are two rings fractured and the tracheal cavity is considerably reduced. There are lesions of dry pleurisy with adhesences. Lungs œdematous and congested. Heart hypertrophied. Diaphragm ruptured, with edges ecchymotic. Part of the intestines, stomach and liver protrude in the chest. Spleen is hypertrophied and weighs four times its normal weight.—(*Rec. and Med. Vct.*)

EMPYEMA OF THE SINUSES—ABSCESS IN THE CRANIUM—DEATH [*Mr. Descazcaux, Army Vct.*].—Fifteen years old, this horse has "strangles" with subglossal abscesses. Also sinusitis of the right side with chorea of the abdominal muscles. Returning from work, he is dull and in the evening has manifestations of chorea in the hind quarters. The gluteal and ischio-tibial muscles are the seat of frequent and repeated contractions. The tail is raised by jerks. These symptoms last for four or five days, disappear, and the animal is taken with immobility. These are complicated with difficulty of sight, which is explained by anemia of the retina detected with the ophthalmoscope. After a treatment of the symptoms the horse dies in comatous condition.

*Post Mortem*—Abscess as big as the fist of a man in the right cerebral hemisphere. Situated in the right ethmoidal fossa, it spreads under the basilar groove to the annular protuberance. The walls of the abscess are bound by the body and right wing of the sphenoid, the right basis of the ethmoid, and the thickened infiltrated dura-mater. Lesions of acute meningitis are present. Sphenoidal sinuses are full of thick pus. Lesions of chronic

sinusitis exist in the right frontal and maxillary sinuses.—(*Rev. Vet. Milit.*)

HUMERO-RADIAL DISLOCATION [*Mr. Magnien, Army Vet.*]  
—Horse slips, falls with right fore leg in extreme abduction. He rises, but is totally disabled. He moves only by jumps, the left fore leg half flexed, touching the ground with the toe. There is a marked deformation at the elbow indicated by a depression under which is a marked projection. This is formed by the articular head of the radius pushed outwards, while the depression is due to a deviation inwards of the inferior extremity of the humerus. The movements of flexion and extension are very limited; those of abduction are more marked. All the manipulations are very painful. Diagnosis of humero-radial dislocation is made and attempts are made to reduce it, a subcutaneous injection of morphia 0 gr. 50 being made previously. The reduction is impossible; the horse is destroyed. *Autopsy:* The entire region of the elbow is infiltrated with blood, muscular serosity and synovia; muscles and their aponeurosis are torn. There are hæmorrhagic spots in the muscles. The humerus is pushed obliquely downwards and inwards. The synovial membrane is all torn. The lateral ligaments of the joints also. The extensors and flexors of the metacarpus and of the phalanges are also the seat of severe lesions in their superior insertions.—(*Rev. Vet. Milit.*)

CRANIAN SYNOSTOSIS BY REPEATED BLOWS IN GOATS [*Prof. Dechambre and Mr. F. Regnault*].—Two skulls of rams have in the middle of the forehead, with which they knocked each other, a large exostosis and synostosis which cannot be attributed to age, as both animals were young. The origin of this condition is traumatic and peculiarly interesting, as to this day the causes likely to bring on early synostosis of the cranium were still discussed.

The characters of these synostosis were very similar in both skulls. They occupied the medio-frontal, lacrymo-frontal, inter-nasal, fronto-nasal sutures, and besides in one of them the maxillo-nasal, fronto-parietal and parieto-occipital. All these synostosis involve only the external face of the sutures; the internal is intact. They are symmetrical and form narrow, bony bridges. The fronto-parietal and parieto-occipital are the only ones entirely ossified. In some points, the inter-nasal, fronto-

lacrymal and medio-frontal are united only in part and show some points free from bony growth. The synostosis are smooth, but in some places show some osteophytes. They do not influence the direction of the Haversian canals nor the form of the cranium.—(*Rev. de Path. Comp.*)

RECTAL PARTURITION [*A. Marcais*].—A cow, seven months pregnant, shows all the symptoms of early parturition. Examination reveals stenosis of the os which resists all attempts to forced dilatation. The next day the animal is quiet, eats, ruminates and makes no more expulsive efforts; the calf is, however, well felt through the neck. As the animal is insured, observation is indicated. Seen now and then the cow only exhibits symptoms of mild metritis. After two months she has new pains and makes violent expulsive efforts. After examination of vagina, the arm is withdrawn covered with feces. The hand is then introduced in the rectum, and at 30 centimeters from the anus one of the branches of the lower maxillary is felt. When this is extracted, an opening wide enough to allow the introduction of the hand is detected and through which, one by one, every bone of the skeleton of the calf was extracted. The uterus was well emptied. The cow made a fair recovery.—(*Prag. Vet.*)

ABNORMALIES IN THE POSITION OF A COLT IN UTERINE HORNS [*Mr. Ricordeau*].—Mare is in labor. In examining the genitals, the writer found on the left in front of the anterior diameter of the pelvis and downwards, a mass which he took for a melanotic growth. Examining further on in the uterus, a piece of the placenta is found but no fœtus. Careful feeling reveals that the mass already detected is movable and made of feet of the fœtus. Exploration on the right side gives the sensation of a similar mass. Extra-uterine gestation is suspected, and after consultation the case is pronounced incurable and slaughter advised. When killed, as the abdomen is opened, the uterus appears containing its fœtus. The body of the little fellow is in the body of the uterus, but its fore legs and head are in the right cornua, while the posterior legs are in the left. The legs are in pairs, held at the bottom of the cornua, and it was these that made the two masses found at the exploration made by the writer. The case was a sterno-abdominal transversal presentation. In opening the uterus, the fœtus was found

covered with its envelope, emphysematous, and with an infectious odor.—(*Presse Vet.*)

PROLAPSUS UTERI—INVAGINATION OF ONE OF THE HORNS —POSSIBILITY OF THE REDUCTION [*Mr. A. Dumaus*].—Cow has delivered her calf and has prolapsus. The uterus is completely turned out and the placenta is still adherent. The delivery is removed and the uterus returned to its place, when of a sudden the animal makes violent expulsive efforts again, and in an instant the condition is worse than ever. Thinking that at the first reduction the uterus had not returned entirely in its normal condition and supposing the possibility of the invagination of one of the horns, the writer tried to find this out, but on account of the efforts of the animal he had to give it up. He then pushed with a funnel into the cavity of the uterus, after having reduced it again; injection with as much tepid water as possible was made, with hope to unfold the horn suspected of invagination. This treatment failed and the cow had to be slaughtered. The autopsy revealed the invaginated condition of the right cornua.—(*Presse Vet.*)

VESICAL LITHIASIS IN A SLUT [*Mr. Douville*].—A small toy terrier slut aged eight years has never been sick. Three days before her death she became dull, listless and vomited. Gastric trouble was suspected and treated accordingly. The next day the condition is worse; the animal will keep nothing on her stomach and seems paralyzed, yet the general functions seem normal and the thermometer shows no elevation of temperature. Examination of the abdomen by palpation reveals the presence of a mass, quite large, whose nature was not yet made out, and the animal dies next day in a comatous condition. At the post mortem the pseudo tumor proved to be the bladder, as big as an orange and formed of four calculi of unequal size. The largest two had a pyramidal form with rounded angles and smooth surfaces; the others were rough. They weighed together 65 grammes. There were no other lesions. Such size for calculi in so small an animal is rather rare.—(*Bullet. de la Soc. Cent.*)

GENERALIZED MELANOTIC SARCOMA [*Capt. Darmagnac and Lieut. Pincon, Army Vet.*].—Seventeen-year-old white stallion had under the tail several melanotic granulations, painless and

without specific characters. One day one of these, about the size of a nut, becomes soft, fluctuating and ulcerated. The discharge was similar to that observed in the opening of such tumors. The tumor, however, grows larger, and is covered with ready-bleeding granulations. The general condition of the animal grows worse. Loss of flesh is accentuated and the cancerous degeneration is indicated by the apparition of another neoplasm as big as an egg in the left inguinal region. Section of the growth examined under the microscope shows its sarcomatous nature. The animal is incurable and destroyed. *Lesions:* On the base and superior face of the tail there were two melanomas as big as the thumb, and with these the primitive ulcerated tumor formed of granulations, cauliflower-like, appears covered with yellowish, ichorous discharge. The lymphatic glands of the left leg, inguinal, superficial and deep are the seat of cancerous nodules. Those of the pelvis, iliac and sub-lumbar regions also. The left kidney and its super-renal capsula, the spleen, the lungs, are also the seat of tumors of various shapes.—(*Rev. Gener. de Med. Vet.*)

SUPPURATIVE ORCHITIS AND EPIDIDYMITIS IN A HORSE [*Mr. Lecomte, Student*].—A five-year-old stallion has a large swelling of the scrotal region. It is puffy, not apparently painful. The general condition is good. Simple œdema is diagnosed and astringent applications are prescribed. The second day the case is worse. Appetite is gone, the animal looks dull, the temperature is up to 40.1° C. The swelling is now hot and painful. The animal in walking holds his left leg in abduction and the slightest pressure gives rise to manifestations of great pain. At the urinary miatus there are a few drops of pus. No fluctuation is detected. Suppurative orchitis is diagnosed and castration indicated. After uncovering the testicle of its envelope, through an incision of the efferent canal, a tube is introduced and one litre of oxygenated water injected in the canal and through the urethra. The testicle was then removed. The next day the temperature is down, appetite returns and recovery completed in eleven days. A section of the testicle showed the presence of three abscesses, which, being in communication with the seminiferous canals, poured their purulent collection into the spermatic tracts. The history of the case did not permit to say if the lesion was the result of an ascending infection or if it only originated from traumatism of the testicular region.—(*Rev. Vet.*)

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## OBITUARY.

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### JAMES H. KELLY, V.S.

Dr. James H. Kelly died at his home in New Haven, Sunday, October 1, 1911, in his fifty-fourth year, a victim of that horrible malady, glanders, after fifteen days of suffering, during most of which time he fully realized his condition and knew there was scarcely a fighting chance for life. In fact, it is believed he diagnosed his own case, and went to the physicians, his personal friends, with the facts. But even with this knowledge they were helpless, and despite every effort that they could put forth and all the scientific knowledge they could summon to their aid, the brave patient at last surrendered and met the end with a calm courage and confidence that will always be a sacred memory to those who were near and dear to him. Dr. Kelly was born in Waterbury, Conn., on December 25, 1857 (Christmas Day), and lived there until he was nineteen years old, when he went to New Haven in 1876, and had made that city his home ever since. He was deeply interested in sports of all kinds, and was for a number of years well known as a baseball umpire for the Western League, and as a polo enthusiast. He was an athlete, and up to the day his illness began, by a swelling in the region of the knee, was in perfect physical condition and did not look his age by ten years. Dr. Kelly was graduated from the New York College of Veterinary Surgeons in 1893 and had practiced his profession in New Haven ever since. He was veterinarian to the fire and street departments of New Haven and had a large clientele in his private practice. He was a member of the American Veterinary Medical Association, and of the Connecticut Veterinary Medical Association, having held, at one time or another, nearly every office in the latter society.

The members of the American Veterinary Medical Association who attended its meeting in New Haven in 1906 will remember Dr. Kelly as the genial, active member of the local com-

mittee who looked after the entertainment and took care of the ladies in attendance. The line of carriages drawn up before the hotel headquarters to take the ladies to the points of interest in and around the "Elm City" is a sweet memory to many members of the association of the days when the horse was still an essential in the program of entertainment at A. V. M. A. conventions.

Dr. Kelly's death has been a terrific blow to the veterinary profession in Connecticut, and one that it will take them a long time to recover from. Men of his princely character are all too few, and his state will miss him sorely. He was always in attendance at the state association meetings, where his counsel was often sought and cheerfully given. Unostentatious, cheerful, optimistic, his happy, smiling countenance and his hearty handshake will be sadly missed at its future gatherings.

Dr. Kelly was a man whose charity was of the finest quality. He seemed to know when and how to give so as to do the most good, and not let his beneficiaries feel that they were in any way objects of charity. He will be missed not alone by the profession in his city and state, but by every one whose privilege it was to know him, for he was as true as steel and a friend worth having and was loved by everyone.

He was a member of the Protective Order of Elks, having been a district deputy of the state, and last year served as Grand Esteemed Leading Knight of the national body.

The high esteem in which our departed brother was held by his associates and townsmen may be gauged when it is noted that the leading state and city officials attended the funeral services to pay their last tributes to his memory. Thirty-six members of the Connecticut Veterinary Medical Association attended his funeral. It required eighty carriages for the delegations of visiting Elks; one hundred and eighty-seven carriages in all being required to carry the mourners, it being said to be the largest funeral cortege ever seen in New Haven.

He is survived by three sisters, Mrs. James McCarthy, Mrs. Mary Farrell and Mrs. Charles Barnes, the last-named having made her home with him for a number of years.

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### JOHN OLIVER GEORGE, A.B., A.M., D.V.S.

Dr. John Oliver George died at his home in Camden, N. J., of heart disease, about the middle of October, in his fiftieth

year. Dr. George was a graduate of the American Veterinary College, class of 1894. The doctor was a native of Pennsylvania, having been born in Northampton County. In his early years Dr. George was a regularly ordained minister, occupying pulpits in Central Pennsylvania; but after receiving his veterinary degree at the age of thirty-three years, he devoted himself to the practice of veterinary medicine, besides serving as food and drug inspector from 1901 to 1907. A number of the alumni of the American Veterinary College were present at the funeral services. Among the floral emblems was one from the "A. V. C. boys" of Philadelphia, and one from the Veterinary Medical Association of New Jersey. Dr. George is survived by a widow and one daughter.

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A WARNING is issued by the veterinary medicine department of the University of Wisconsin against the feeding of beets that have been frozen and thawed. Some little loss was reported last year by stockmen in that state which was traced to this source. In one instance frozen beets were boiled with grain and fed to hogs, producing death from paralysis of the heart. The danger from frosted second-growth sorghum has long been known and feared.—(*Breeder's Gazette.*)

HORSES IN FRANCE.—The French Government distributed last year 840,000 pounds as prizes at horse shows and otherwise in fostering the horse industry. The encouragement given horse-breeders in France takes the form of cash, and other prizes offered for stallions and breeding stock at shows and bounties to the owners of approved stallions standing for service at moderate fees. In addition to this the government maintains 3,500 well-bred stallions of its own which, last year, were bred to 150,935 mares. The approved stallions on which bounty was paid served 92,482 mares, making a total of 243,416 mares bred in France in one season under government supervision. France is more advanced than any nation in Europe in encouragement extended to horse-breeders.—(*The Live Stock Journal.*)

## BIBLIOGRAPHY.

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### VETERINARY BACTERIOLOGY.

VETERINARY BACTERIOLOGY, by Robert E. Buchanan, Ph.D., Professor of Bacteriology in the Iowa State College of Agriculture and Mechanic Arts, Division of Veterinary Medicine. Octavo of 516 pages, with 214 illustrations. Philadelphia and London, W. B. Saunders Company, 1911. Cloth, \$3.00.

The intention of the author has been not to prepare a textbook on pathology, but to deal with those topics that unquestionably lie within the province of bacteriology. The book is divided into six sections:

Section I. deals with the morphology, physiology and classification of bacteria.

Section II. The laboratory methods and technic.

Section III. Bacteria and the resistance of the animal body to disease. In this section immunity, antitoxin and related bodies, agglutination and precipitation, opsonins and phagocytosis are discussed in separate chapters in a very concise manner.

The chapter on anaphylaxis and hypersusceptibility is of especial interest to all working along the lines of serum therapy.

Section IV. contains the pathogenic micro-organisms exclusive of the protozoa, and discusses micro-organisms as a cause of disease. This chapter also contains a group system of classification of the pathogenic bacteria, which should prove valuable to the student and teacher.

Section V. deals exclusively with the pathogenic protozoa and contains up-to-date information on the structure and classification of the protozoa.

Section VI. discusses the infectious diseases in which the specific cause is not certainly known. The illustrations and photo-micrographs are numerous, well selected and uniformly good.

While it is essentially a book for the veterinary student, it will, however, be found of much value to the busy practitioners, who will find within its pages correct information dealing with a branch of veterinary medicine that is advancing with rapid strides. There is a full and complete discussion of the nature

of toxins, of the origin of antitoxins, and of immunity to toxin, as well as agglutins, precipitins, phagocytosis and similar phenomena, all of which subjects are becoming of increasing practical application in veterinary medicine. Throughout the book much important information is given in comparatively few and simple words. The work represents the latest teaching along lines of bacteriological research and will surely prove a very useful book to the student, teacher, laboratory worker, and practitioner as well. It is a welcome addition to veterinary literature.

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## CORRESPONDENCE.

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FT. COLLINS, COLO., October 11, 1911.

*Editors of the AMERICAN VETERINARY REVIEW,*  
New York, N. Y.:

SIRS—I wish to correct an error on page 114, Vol. XL., No. 1, of the REVIEW.

The report of the Committee on Diseases of the forty-eighth annual meeting of the A. V. M. A. consisted of a chairman's report and five sectional reports. Each was prepared by a single member, so that the entire committee was not responsible for each part but just for what he prepared. The signatures of the committee should not have been appended to the report in question as shown on page 127.

Very sincerely yours,

B. F. KAUPP.

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LOS ANGELES, CAL., October 4, 1911.

*Editors AMERICAN VETERINARY REVIEW:*

At the regular quarterly meeting of the Southern Auxiliary, California State Veterinary Medical Association, held at the Hollenbeck Hotel, this city, September 20, 1911, it was passed around the banquet board that our worthy member, Dr. Wm. Anderson, would on Monday, September 25, 1911, celebrate his golden wedding. So, when we came to new business, Dr. John Tyler's motion was unanimously carried (and then some), that our committee on resolutions draft suitable resolutions, com-

memorating that happy event, and forward the same to the Doctor and Mrs. Anderson at their home, 1280 West Thirty-eighth street, this city. We also had the pleasure of entertaining at our banquet and meeting their son, Dr. Chas. Anderson, of Yonkers, N. Y., who had crossed the continent to be present on that eventful day.

Yours truly,

J. A. DELL, Secretary.

WASHINGTON, D. C., September 12, 1911.

Editors AMERICAN VETERINARY REVIEW, New York:

SIRS—I am sending you under another cover a photograph of two beautiful silver pieces presented to me by the veterinarians of the United States Army, in appreciation of a little effort on my part looking to their future comfort and happiness.



Inasmuch as these generous brethren are scattered to the four winds, it will not be possible for them to see this bowl and coffee urn, hence I thought a photograph, made by Dr. C. M. Mansfield, of Washington, D. C., would reach all of them. should you see fit to publish it in the REVIEW.

Very truly yours,

J. P. TURNER.

## SOCIETY MEETINGS.

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### AMERICAN VETERINARY MEDICAL ASSOCIATION.

ATTENDANCE LIST, TORONTO, AUGUST, 1911.

#### *Members.*

ALABAMA—C. A. Cary.

CALIFORNIA—R. A. Archibald, P. H. Browning, David F. Fox, Charles Keane.

COLORADO—Robert H. Bird, George H. Glover, B. F. Kaupp, Charles G. Lamb.

CONNECTICUT—Thomas Bland, Fred F. Bushnell, Joseph M. Curry, A. C. Knapp, V. M. Knapp, Grove W. Loveland.

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KENTUCKY—C. A. Miller, H. O. Moore.

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MAINE—George F. Wescott.

MARYLAND—William Dougherty, Dickinson Gorsuch, Herbert Hoopes, F. H. Mackie, E. C. Schroeder, Robert V. Smith.

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MISSISSIPPI—Tait Butler.

MISSOURI—Thomas O. Anders, H. Jensen, A. T. Kinsley, R. C. Moore, S. Stewart, S. L. Stewart, J. L. Zeiler.

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NORTH DAKOTA—J. P. Chisholm, J. W. Robinson, L. Van Es, E. J. Walsh.

NEW JERSEY—William Gall, John B. Hopper, W. Runge, Thomas E. Smith, George B. Vleit.

NEW YORK—E. B. Ackerman, W. L. Baker, W. Reid Blair, George H. Berns, S. H. Burnett, David W. Cochran, Robert W. Ellis, P. A. Fish, Alex. Findlay, Otto Faust, J. G. Hill, W. G. Hollingworth, Frank Hunt, Wilson Huff, Wm. Henry Kelly, W. J. McKinney, Robt. S. MacKellar, D. J. Mangan, Howard J. Milks, V. A. Moore, C. R. Perkins, Thomas Sheldon, C. H. Taylor, A. J. Tuxill, Bernhard P. Wende, A. G. Wicks, J. G. Wills, W. L. Williams.

NORTH CAROLINA—G. A. Roberts.

OHIO—F. E. Anderson, W. A. Axby, L. P. Beechy, J. H. Blattenburg, G. W. Cliffe, Arthur S. Cooley, Louis P. Cook, J. D. Fair, Paul Fischer, C. B. Frederick, Reuben Hilty, A. J. Kline, J. H. McNeil, J. C. Meyer, W. H. Redhead, Walter Shaw, Edgar H. Shepard, W. H. Washburn.

PENNSYLVANIA—H. P. Bolich, E. L. Cornmann, G. A. Dick, M. W. Drake, George R. Fetherolf, Frank U. Fernsler, S. H. Gilliland, R. C. Gross, W. Albertson Haines, Jacob Helmer, W. Horace Hoskins, H. Preston Hoskins, W. G. Huyett, Thomas Kelly, F. H. McCarthy, David McKibbin, Jr., J. C. McNeil, C. J. Marshall, Otto G. Noack, E. C. Porter, Edgar

W. Powell, John Reichel, M. D. Rentschler, W. H. Ridge, J. W. Sallade, F. H. Schneider, B. F. Senseman, Charles W. Springer, J. P. Stover, W. J. Tomlinson, S. E. Weber, W. E. Wight.

RHODE ISLAND—J. M. Armstrong, Charles T. Frey, John S. Pollard.

SOUTH DAKOTA—S. E. Cosford.

TENNESSEE—Charles J. Becker, J. W. Scheibler, George R. White, J. H. Gould.

VERMONT—C. D. McMurdo, F. A. Rich.

VIRGINIA—Patrick H. Hudgins, Nelson S. Mayo.

WEST VIRGINIA—H. B. Langdon.

WISCONSIN—W. G. Clark, F. B. Hadley, E. A. McCullough, F. W. Philp, J. W. Tooley, Thomas Wrigglesworth, L. A. Wright.

WASHINGTON—A. J. Damman, J. W. Kalkus, S. B. Nelson, W. E. Ralston.

WASHINGTON D. C.—D. E. Buckingham, Adolph Eichhorn, R. W. Hickman, A. D. Melvin, John R. Mohler, John P. Turner.

HAWAII—Victor A. Noorgaard.

#### CANADA.

MANITOBA—C. D. McGilvray, S. F. Martin, F. H. Richards, F. Torrance.

NEW BRUNSWICK—D. McCuaig, A. T. McLean, William Jakeman.

ONTARIO—John W. Groves, E. A. A. Grange, S. Hadwen, A. W. Harris, Charles H. Higgins, D. McAlpine, W. C. McGuire, A. E. Moore, J. G. Rutherford, J. H. Tennent, Thomas Thacker, John H. Wilson.

QUEBEC—A. A. Etienne, M. C. Baker.

SASKATCHEWAN—J. S. McIntyre.

#### *Visitors.*

CALIFORNIA—Master Baker Browning.

CONNECTICUT—J. S. Alford, Frank G. Atwood, Charles F. Roberts.

ILLINOIS—P. Barber, Ed. Beatty, I. E. Bill, J. F. Black, Wm. J. Cant, Joseph F. Dunn, Alex. Eger, A. J. Gibbons, N. W. Hillock, Master R. O. Hughes, Wm. A. Johnston, Howard L. Jones, W. J. Martin, H. P. Rasmussen, Joseph F. Pottinger, Robert Rives, C. P. Shaughnessy, T. D. Shearburn, A. W. Smith,

R. W. Story, E. B. Thomas, J. P. Thiry, B. F. Ward, W. B. Wise.

INDIANA—D. K. Buzzard, Ren C. Julien, J. D. McLeay, Emmett Davis, F. M. Hall, A. F. Nelson, W. A. Salmon, Master L. Salmon, G. O. Smith, A. H. Stewart, H. G. White.

IOWA—G. R. Beavers, H. E. Bemis, C. A. Bradley, I. B. Edwards, W. A. Kippen, S. A. Deming, Wm. Readhead, C. W. Reed, Ed. Viers.

KANSAS—A. J. Smith.

KENTUCKY—E. S. Good, Robert Graham.

LOUISIANA—N. S. Dougherty.

MARYLAND—J. Huebschmann.

MASSACHUSETTS—Frederick H. Bradley, W. J. Hennessy, W. J. Meloche, H. E. Paige, Roger N. Perry, Dwight Pierce, W. T. Pugh, J. H. Seale, Jesse A. Viles, C. J. Williams, R. T. Williams.

MICHIGAN—G. B. Cask, Edwin B. Cavell, D. Canning, C. C. Dauber, R. Elgar, N. S. Ferry, Walter Gohn, Wm. Hansen, Wilford A. Haynes, J. Hawkins, W. J. Johnson, T. F. Krey, D. H. McChesney, R. W. MacDonald, John M. Miller, E. E. Patterson, C. C. Petty, A. B. Sexmith.

MISSISSIPPI—J. F. Kennedy.

MISSOURI—L. S. Backus, Albert S. Kinsley, W. E. Martin, O. J. Phillyn, R. P. Poage, Frederick W. Shaffer.

NEW JERSEY—John H. Nunn, Thomas B. Rogers, H. G. Black, B. M. Hance, George W. Smith, E. B. Barnes, H. K. Aiken, L. L. Bishop.

NEW YORK—P. Burns, F. E. McClelland, W. A. Cole, J. A. McCrank, E. E. Dooling, F. D. Fordham, O. B. French, Hiram T. Gaetz, A. George Tegg, L. W. Ham, R. E. Healey, N. P. Hinkley, E. B. Ingalls, Wm. Henry Kelly, Jr., Capt. Wm. F. Kirchner, J. MacDonald, Edward Rafter, K. A. Shaul, W. B. Smith, Garry T. Stone, C. R. Webber, J. Whytock, Joseph L. Wilder.

NORTH CAROLINA—W. G. Chrisman, F. S. Charter, A. C. Janes, L. F. Koonce.

NORTH DAKOTA—J. W. E. Bryans, R. H. Treacy.

OHIO—James F. Barnes, H. F. Beer, Glen Biddle, E. H. Callander, Henry A. Corsant, E. M. DeTray, Norton Dock, B. C. Eldredge, W. C. Fair, C. W. Fogle, H. Fulstow, B. W. Groff, R. D. Heller, E. O. Hess, Robert C. Hill, S. R. Howard, C. E. Inskeep, J. H. Jefferson, F. W. Johnston, T. E. Jones, M.

McClain, W. O. McGuigan, H. M. Manley, O. F. Nugent, H. B. Roop, George L. Schneider, L. A. Severcool, Z. W. Seibert, C. N. Turner, W. H. Turner, B. F. Wingard, W. F. Wise, E. C. Wisman.

PENNSYLVANIA—E. G. Britton, S. E. Bruner, Edward A. Cahill, A. B. Cole, John O. Eymann, C. R. Good, J. B. Irons, R. L. Kann, J. Rein Keelor, John J. Kehoe, George Magee, J. F. Meredith, K. F. Meyer, F. B. Miller, J. F. Olweiler, H. F. Pegan, R. W. Phelan, N. Rechtenwald, F. N. Sherrick, George D. Sherrick, C. Z. Solberger, William T. Webb, Wm. M. Wilson.

RHODE ISLAND—L. T. Dunn.

TENNESSEE—J. W. Scheibler, Jr.

WEST VIRGINIA—J. C. Callander.

WISCONSIN—A. H. Hartwig, H. E. Hensel, A. A. Moody, Mazyck P. Ravenel, Clinton Wray.

#### CANADA.

MANITOBA—H. Bradshaw, Will A. Hilliard, W. R. Taylor.

NOVA SCOTIA—Harry Jakeman.

ONTARIO—Robert Barnes, J. E. Bennett, J. H. Black, H. O. Bond, P. T. Bowlby, A. S. Brodie, B. F. Butler, R. Arthur Byer, J. A. Campbell, W. Cavan, F. Chalk, W. A. Clapp, S. R. Craver, Wm. Dann, Henry A. Eckert, L. H. Eckert, F. C. Evans, W. J. R. Fowler, W. D. Forsyth, George Hilton, J. B. Hollingworth, C. L. Hurd, J. C. Jenkins, W. D. MacCormack, John A. MacDonald, J. F. McGregor, David McGill, John MacBride, C. S. MacDonald, G. G. Mauser, W. N. Middleton, John N. Pringle, A. R. B. Richenbach, J. Martin Rice, H. H. Ross, S. C. Rudd, C. G. Saunders, Frank W. Schofield, C. Shain, H. B. Sills, W. W. Stark, D. C. Tennent, A. M. Van Cleaf, L. A. Willson, R. E. Willis, W. J. Wilson, W. C. Young.

SASKATCHEWAN—J. A. Armstrong, A. A. Lockhart, J. J. Murison, S. S. Smiley.

#### ENGLAND.

Frederick Hobday, F.R.C.V.S.

#### *Lady Visitors.*

CALIFORNIA—Mrs. P. H. Browning.

CONNECTICUT—Mrs. V. M. Knapp.

DISTRICT OF COLUMBIA—Mrs. D. E. Buckingham, Mrs. J. P. Turner.

ILLINOIS—Mrs. I. E. Bill, Mrs. C. G. Glendenning, Mrs. H. D. Paxson, Mrs. Wm. J. Cant, Mrs. E. L. Quitman, Mrs. W. A. J. Gibbons, Mrs. A. G. Gieske, Miss Pauline Rives, Mrs. Robert Rives, Mrs. H. D. Chamberlain, Mrs. D. P. Rickards, Mrs. Herbert F. Palmer, Miss Josephine K. Hughes, Miss R. A. Murphy, Miss Helen M. Hughes, Mrs. Joseph Hughes, Mrs. G. B. McKillip, Mrs. Cassius Way, Miss Ruby Kays, Miss Myrtle Pray, Mrs. A. W. Smith, Mrs. Almira M. Ryan.

INDIANA—Mrs. F. A. Bolser, Mrs. Mary R. Ferling, Miss Rose Ferling, Miss Edna Ferling, Mrs. W. A. Salmon, Mrs. O. G. Whitestone, Mrs. J. W. Klotz, Miss Agnes Klotz, Miss Maud Lowther, Mrs. T. M. Hall, Miss Marion E. Craig, Mrs. J. D. McLeay, Miss Margaret Mueller, Mrs. A. V. Johnson, Mrs. A. B. Niven, Mrs. O. L. Boor, Miss Mabel McLeay, Miss M. Barnes, Mrs. G. W. Butler, Mrs. W. J. Armour, Mrs. C. J. Fleming.

IOWA—Mrs. Grace L. Bemis, Mrs. A. S. Brodie, Mrs. J. W. Edwards, Mrs. E. Z. S. Giser, Mrs. G. A. Johnson, Mrs. W. A. Kippen, Mrs. P. Malcolm, Mrs. George A. Scott, Mrs. Wm. Readhead, Mrs. C. W. Reed, Mrs. T. D. Shearburn, Mrs. O. J. Phyllin, Mrs. C. H. Stange, Mrs. C. A. Stewart.

KANSAS—Mrs. George F. Babb, Mrs. Charles H. Jewell, Mrs. F. S. Schoenleber, Miss May Still, Mrs. Mary Still.

KENTUCKY—Mrs. C. A. Miller, Miss Verling, Mrs. Young.

LOUISIANA—Mrs. N. S. Dougherty, Mrs. Don. Houston.

MARYLAND—Mrs. Dickinson Gorsuch, Mrs. J. Huebschmann, Mrs. F. H. Mackie, Mrs. C. P. Wilson.

MASSACHUSETTS—Mrs. Francis Abele and two children, Mrs. J. G. Cruikshank, Mrs. Daniel Emerson, Miss L. A. Higgins, Mrs. H. Lukes, Miss Ruth Lukes, Mrs. Charles H. Perry, Mrs. Harrie W. Pierce, Mrs. Ben. Pierce, Mrs. N. T. Pugh, Mrs. W. M. Simpson, Mrs. J. H. Seale, Miss Eva O. Webster, Mrs. C. J. Williams, Mrs. J. Winchester.

MICHIGAN—Mrs. F. M. Blatchford, Mrs. S. Brenton, Mrs. J. S. Donald, Mrs. Geo. W. Dunphy, Miss Gaylor, Mrs. J. Hart, Mrs. Thos. Farmer, Mrs. James Garman, Mrs. G. D. Gibson, Mrs. H. M. Gohn, Mrs. R. W. MacDonald, Mrs. E. E. Patterson, Mrs. C. C. Petty, Mrs. U. S. Springer, Mrs. A. B. Sexmith, Mrs. J. E. Wurm.

MISSISSIPPI—Mrs. Tait Butler, Miss Seta Butler.

MINNESOTA—Mrs. Charles E. Cotton, Mrs. G. Ed. Leech

MISSOURI—Miss Ruth Jensen, Mrs. A. T. Kinsley, Mrs. R.

C. Moore, Mrs. R. P. Poage, Miss Guanetta Stewart, Mrs. S. L. Stewart, Mrs. C. H. Speers, Mrs. J. S. Zeiler.

NEW JERSEY—Mrs. Bryam Smith, Mrs. H. G. Black, Mrs. George W. Smith, Mrs. John B. Hopper, Mrs. J. H. Nunn, Mrs. Bertha G. Vleit, Miss Wenda Runge.

NEW YORK—Mrs. Roscoe R. Bell, Mrs. George H. Berns, Miss Nellie C. Berns, Mrs. L. L. Bishop, Mrs. Wilson Huff, Mrs. Gertrude Huff Gihby, Miss Delilah Higby, Miss Minnie Wales, Mrs. Robert W. Ellis, Mrs. H. J. Milks, Mrs. Hiram T. Gaetz, Miss A. Pullman, Mrs. L. R. Weber, Mrs. C. R. Webber, Mrs. J. L. Wilder, Mrs. V. A. Moore, Miss Mary E. Moore, Mrs. W. G. Hollingworth, Miss Hannah Hollingworth, Mrs. Wm. H. Kelly, Miss E. M. Fish, Miss Rosina MacDonald, Miss C. H. Faust, Miss Anna Loebenstein, Miss Charlotte W. Hunt, Mrs. W. L. Williams, Mrs. Edward Rafter, Mrs. C. R. Perkins, Mrs. W. B. Smith.

NORTH CAROLINA—Mrs. A. C. Jones.

NORTH DAKOTA—Miss J. A. Bryans, Mrs. J. W. Robinson, Mrs. L. Van Es, Miss Matye Van Es, Mrs. E. J. Walsh.

OHIO—Mrs. E. H. Callander, Mrs. E. Jones, Miss J. Jones, Mrs. M. McClain, Mrs. Paul Fischer, Mrs. L. A. Severcool, Mrs. A. J. Kline, Mrs. E. O. Hess, Mrs. Z. W. Seibert, Mrs. E. H. Shepard, Mrs. H. F. Beer, Miss Ruby Wingard, Mrs. R. C. Eldredge, Miss Mattie Myers, Mrs. Turner, Miss Iva Sanderson, Mrs. Washburn, Mrs. Walter Howard, Miss Mary J. Murray, Miss Lora E. Murray, Mrs. W. J. Spears, Mrs. E. M. DeTray, Mrs. W. F. Wise, Mrs. R. D. Heller, Mrs. M. E. Cliffe, Miss Helen Cliffe, Mrs. J. D. Fair, Miss Ada M. Gregg, Mrs. B. W. Groff, Mrs. J. H. McNeil, Mrs. L. M. Manley, Mrs. W. H. Redhead, Mrs. E. C. Wisman, Miss Edith Wisman.

PENNSYLVANIA—Mrs. C. J. Marshall, Mrs. E. C. Dingley, Mrs. F. H. Schneider, Mrs. W. Horace Hoskins, Miss Margaret E. Hoskins, Mrs. David McKibbin, Jr., Mrs. William H. Ridge, Mrs. W. Albertson Haines, Mrs. Edgar W. Powell, Miss Margaret Barry, Mrs. R. C. Gross, Mrs. Wm. M. Wilson, Mrs. Robert Gladfelter, Mrs. Alexander Glass, Miss Bessie Glass, Mrs. J. P. Stover, Mrs. G. A. Dick, Mrs. Mary A. Sallade, Miss Katie M. Sallade, Mrs. F. H. McCarthy, Mrs. William T. Webb, Mrs. Walter G. Huyett, Mrs. Thomas Kelly, Mrs. R. M. Phelan, Mrs. C. R. Good, Mrs. Martha S. Helmer, Miss H. McLaughlin, Miss Ellen Sherrick, Miss Grace Solberger, Miss Ida F. Solberger, Mrs. E. C. Porter, Mrs. Eymen, Mrs. Mary E. Sherrick, Mrs. W. Wight, Mrs. F. B. Miller.

RHODE ISLAND—Mrs. L. T. Dunn, Mrs. John S. Pollard.  
 TENNESSEE—Mrs. C. J. Becker, Mrs. Ida A. Scheibler.  
 WASHINGTON—Mrs. S. B. Nelson.  
 WEST VIRGINIA—Mrs. J. C. Callander.  
 WISCONSIN—Mrs. C. A. Carter, Mrs. W. G. Clark, Mrs. Fred Lambert, Miss M. E. Tooley.

## CANADA.

BRITISH COLUMBIA—Mrs. L. Stewart.  
 MANITOBA—Miss Lillian Stewart, Mrs. W. R. Taylor, Mrs. S. T. Martin, Miss Minnie E. Bradshaw.  
 NEW BRUNSWICK—Mrs. D. McCuaig.  
 ONTARIO—Mrs. R. H. Higgins, Mrs. Wm. Dann, Miss Ada Jermyn, Mrs. James Cruikshank, Mrs. John Riesberry, Mrs. H. B. Sills, Mrs. H. W. Smith, Miss Carrie Looe, Miss Pearl Looe, Mrs. H. A. Middleton, Mrs. J. H. Tennent, Miss Winifred Hollingworth, Mrs. J. B. Hollingworth, Mrs. A. E. Moore, Mrs. R. Gamble, Mrs. W. A. Harris, Miss A. Eagle, Miss Josephine Hamilton, Mrs. H. H. Ross, Miss E. M. Tooley, Miss F. N. Tooley, Miss L. Cooper, Mrs. Samuel Lukes, Mrs. David McGill, Miss Irene Glendenning, Miss Annie Butler, Mrs. E. A. Butler, Mrs. B. F. Butler, Miss Johnston, Mrs. J. W. Groves, Miss Brodie, Miss Lizzie Jenkins, Mrs. H. Coleman, Mrs. Belle Clement, Miss D. Groves, Mrs. C. S. MacDonald.  
 QUEBEC—Mrs. A. A. Etienne, Mrs. Anna Ryan, Miss May Stewart.  
 SASKATCHEWAN—Mrs. Armstrong, Miss Pearl Armstrong, Miss Armstrong, Miss Pearl Farrell.

## CLINIC—OPERATIONS AND RESULTS.

Through the courtesy of Prof. W. J. R. Fowler, of the Ontario Veterinary College, we are able to fulfill our promise to our readers (made in our October issue), to give them a report of the clinic, including the condition of each subject operated upon to date as follows:

Case I.—*Laryngeal hemiplegia* in chestnut gelding. Operator, Prof. F. Hobday. Patient apparently doing well. Has been turned into loose box and will be allowed to run until December. Wound healed by granulation. The animal did not suffer from operation.

Case II.—*Laryngeal hemiplegia* in chestnut mare. Operator, Prof. Hobday. Has also been running loose and will not be harnessed before December. Wound healed by granulation. Patient not inconvenienced by operation.

Case III.—*Laryngeal hemiplegia* in aged gelding. Operator, Prof. Hobday. Died following morning from asphyxiation.

Case IV.—*Poll-Evil*. Operator, Prof. L. A. Merillat. Patient was put to work September 26; wound not quite healed, but completely healed at this date. Very small cicatrix remains, which is hidden by mane.

Case V.—*Stringhalt*. Operator, Prof. L. A. Merillat. Animal made complete recovery and does not present any involuntary movement of limb. The healing of lower wound was tardy and left a marked thickening. Small cicatrix at superior incision.

Case VI.—*Cryptorchid*. Operator, Dr. Joseph W. Klotz. Patient removed to its own stable after clinic and made rapid recovery.

Case VII.—*Cunean tenotomy*. (Operator's name not obtained.) Results unfavorable, no relief being given to condition.

Cases VIII. and upward, consisted of a number of *canine operations*, with complete recoveries in each case.

#### COMMITTEES APPOINTED BY PRESIDENT BRENTON.

*Executive*.—Dr. E. H. Shepperd, Chairman; Dr. L. A. Merillat, Dr. S. B. Nelson, Dr. C. D. McGilvray, Dr. C. G. Lamb, Dr. E. B. Ackerman.

*Intelligence and Education*.—Dr. F. S. Schoenleber, Chairman; Dr. E. A. A. Grange, Dr. Geo. H. Glover, Dr. A. T. Kinsley, Dr. O. L. Boor.

*Legislation*.—Dr. W. H. Hoskins, Chairman; Dr. W. G. Hollingworth, Dr. F. H. Schneider, Dr. J. R. Mohler, Dr. Jas. Robertson.

*Diseases*.—Dr. J. R. Mohler, Chairman; Dr. C. H. Higgins, Dr. C. E. Cotton, Dr. Ward R. Giltner, Dr. S. H. Burnett.

*Finance*.—Dr. G. A. Johnson, Chairman; Dr. J. J. Joy, Dr. G. Ed. Leech, Dr. E. B. Ackerman, Dr. Thos. Thacker.

*Publication*.—Dr. R. P. Lyman, Chairman; Dr. R. W. Ellis, Dr. C. J. Marshall, Dr. Geo. B. McKillip.

*Necrology*.—Dr. W. H. Dalrymple, Chairman; Dr. A. T. Peters, Dr. B. F. Kaupp, Dr. Paul Juckiness.

## NEW YORK STATE VETERINARY MEDICAL SOCIETY.

The twenty-second annual meeting of the above society was called to order by the president, Dr. E. B. Ackerman, at 10.30 a. m., September 12, 1911, at "The Imperial," Brooklyn, N. Y. President Ackerman then introduced Dr. Travis R. Maxfield, Assistant Sanitary Superintendent and Chief of the Brooklyn Division of the New York City Department of Health, who welcomed the society to Greater New York. The address of welcome was responded to by Dr. Robert W. Ellis, after which, Dr. Ackerman gave the president's address.

### PRESIDENT ACKERMAN'S ADDRESS.

Ladies and Gentlemen—As your presiding officer, I want to tell you how very much pleased I am to address you here in my home city—"The City of Churches and Homes."

I am somewhat disappointed at the rather small gathering or number in attendance at the opening of our session.

Unfortunately this is usually the case, as our members straggle in one by one, and the meeting warms up and grows as it proceeds and I have every reason to believe we will have a well filled meeting here. One of the causes of this light attendance at this time is our State Fair now in session at Syracuse, which calls a number of our members there on business and in business interests.

Howsoever, those of us who are here, are full of the spirit of the occasion and what we lack in numbers now, we will make up in interest and earnestness, so that when the late ones join us they will find us in full swing and that it has been their loss and not ours.

We have listened to the instructive address of welcome offered us by our friend, Dr. Maxfield, the Chief of our Department of Health for this Borough, and the brilliant response made by our associate, Dr. Ellis, and I am sure we all feel flattered and instructed by these pleasant and encouraging remarks. During the year your officers and the chairmen of the various committees, have worked in harmony, and the results of such work will show in their reports.

I have taken up the matters pertaining to our work under several heads so that we may have them in some order for future discussion.

## LEGISLATION.

Our legislation is unfortunately unfinished this year, as our legislators adjourned before passing or disposing of our bill, but they reconvene this month as an adjourned session when we hope to get some consideration.

In relation to our Veterinary Laws our Bill No. 528 has passed the Assembly and is still in the Committee on Public Health in the Senate. At this special session we hope to get it out and get favorable action upon it.

Unfortunately for us there was running simultaneously with our bill, another bill, No. 313, to open the doors of registration again, allowing all the unqualified men practicing here to become registered and legal practitioners.

Our educational wall is so securely built for an entrance into our colleges in this state, that it practically keeps out all students from adjoining states, and drives much good material of our own to other states for their education.

This being so, many of the nearby states and Canada, having veterinary colleges that do not require such high standards of education are turning out large numbers of graduates as compared to those we are sending out in the profession and they are locating and practicing here regardless of the law and our high standards, while our own men who have passed through *all the educational and legal requirements* of our state are *offered no protection* at all, and thus the unqualified man has every advantage.

This too is an imposition upon the public, for when a man hangs out his shingle, how is the public to know which is the qualified man and which is not, believing as it does, that when a man hangs out his shingle he does so, because the law says he is qualified.

Bill No. 528 is asked for, so that we can offer some protection to our graduates, and reach these illegal practitioners in an effective way. This law must *pass* and *prevail*, and this law to open the doors of registration again must be *defeated*.

No other profession in this state has ever gone backwards and again opened its doors to quackery and imposition, and we must not do so. It would be a black eye that would put us back twenty years at least.

I therefore believe that our colleges and our state department of education should join with us and ask the legislators to give our graduates this protection.

The chairman of the committee on legislation will give us a detailed report of this work, but I am going to ask you now, each individual qualified man, whether a member of this body or not, to make it his business to follow up this legislation, and see that his assemblyman or senator votes to pass this bill, and also votes to destroy the bill to legalize quacks.

We will have another bill to present at the next session of the assembly that is of great interest to our profession, and that is the "Stallion Service Bill," the history and facts of which will be presented to you for your action and consideration by the chairman of the committee having that subject in charge.

#### COLLEGES.

We have, as you know, two colleges in this state, one a private school struggling for existence under our impossible educational requirements, but which has in the past graduated many men that are now prominent in the profession and which is represented in more states, territories and countries than any other school, and is also probably represented in the faculty of many of our schools as teachers and professors. As I said before, this school is struggling for an existence. This year an effort was made through legislation to have the New York-American Veterinary College receive state recognition and support, but I am sorry to say although the bill passed both houses, it was vetoed by the governor. The reason for his vetoing this bill has not yet been made clear to me.

Our other school, located at Ithaca, N. Y., a department of Cornell University and a state institution, the N. Y. State Veterinary College, supported by state funds as well as university appropriations is a most excellent school, doing a magnificent work.

This school is constantly receiving state support in special appropriations, for instruction, equipment, buildings, etc., and also private donations for libraries, specimens, etc.

It also asked for a special appropriation from the legislators this year for additional buildings, which was fortunately granted, so that by another year they will have a magnificent building added to their already splendid equipment.

I am perfectly confident that these two classes of schools are necessary, as each school graduates a different character of man.

The State of New York gives free tuition to residents of this state, at Cornell, while the great majority of its students upon completing their course of studies so given, start either in the

Government service, or laboratory work in other states or colleges so that our state loses the value of these men who they have educated.

The vacancies by death or other causes, in our ranks yearly are being filled by the illegal practitioners or quacks, while if the private schools could live under reasonable educational requirements, we could fill many places where even in this state, there is a dearth of practical qualified men.

And after talking with men from all parts of North America at the last meeting of the American Veterinary Medical Association, at Toronto, I find that the west is still yearning for practitioners, not bacteriologists, microscopists, and laboratory specialists, but practitioners and field men, who really make up the backbone of our noble calling.

On our Canadian border is one of our old schools which is living up to all the requirements established by our American Veterinary Medical Association, and the regulations of our Bureau of Animal Industry, and which is turning out many good men who when they come to this state do so as illegal practitioners; yet we in this state, cannot begin to compete with this school for students on account of our excessive educational qualification already spoken of.

One of the signs of progress and advancement in our profession at our colleges is the formation of a Greek Letter Fraternity, "Alpha Psi," with chapters located in six different schools throughout the country, and this is bound to grow and develop and be productive of much good; it not only brings our men closer together, but it helps unite our educational institutions.

Personally I feel very much flattered because I have been elected an honorary member of Beta Chapter of Alpha Psi Fraternity.

I would also like to suggest that this body adopt in the form of a resolution the suggestion offered by Dr. Glover, ex-president of the A. V. M. A., that all colleges give a uniform degree, making in our suggestions or resolutions what that degree should be, and why.

While talking on the subject of legislation, I brought to your attention the high legal entrance requirements.

Our A. V. M. A. this year passed resolutions requiring all schools after 1913-14 to have as a standard of education for en-

trance into a veterinary college, one year in high school or its equivalent, and after 1918-19 two years or its equal.

This puts the standard in this state two years hence, four times as high as any other state, and seven years hence it will still be twice as high as any other school.

Our high standard that we reached by such rapid strides in such a short period of time has been almost equal to disbarment of veterinary students in this state. It has had the effect of almost closing the doors of one of our schools and very greatly reducing the attendance at the other where the tuition is free. It has absolutely and forever cut off students from adjoining states, and our few students which this state educates at state's expense are readily gobbled up by our National Government and other states and colleges; while our own state suffers from a dearth of practitioners of standing, and is filling up with quacks and illegal practitioners from other states and countries, to impose upon the innocent public. I therefore feel that while we all favor higher education, that ours is *too* high, and that we are practicing professional suicide by continuing along the unseasonable and unreasonable conditions we have established.

It is therefore, the recommendation of your presiding officer, that this meeting take up this subject of higher education and entrance requirements, and see if it would not be to our advantage to modify our laws and regulations, and while we need not fall to the low requirements asked for by many colleges as a standard to be set by our National Association, I do think that our own entrance requirements should not at this time be more than a 24-count or two years high school or its equivalent 1918-19, when all the other schools will reach this standard; then we, the Empire State, could move on, be in the lead, and in advance of all others by moving up our requirements; but in the meantime, it would still allow us to have a reasonable number of students and these same students would still from an educational standpoint be above the average.

This is the position I took in this matter when our education entrance requirements were raised by recommendation of this society in this state some five or six years ago, when our late Dr. Bell and myself put in a minority report on this subject, and we were beaten by two votes in a packed meeting in Buffalo.

While no one likes to go backward, it seems necessary at this time for our preservation to retrace our steps or retreat, as often

happens in business concerns, when they find that the means do not obtain the ends.

That, gentlemen, is what the veterinary profession in this state will have to do if we expect to even hold our own, and I trust that this meeting will take some action in this matter, so that our loss may be reduced sufficiently to allow us as a profession to live in our own state.

#### FEDERAL, STATE AND MUNICIPAL SANITARY MEASURES.

We all know to a greater or less extent what our National Bureau of Animal Industry is doing. Executive, laboratory, field work and meat inspection. What a vast number of veterinarians it employs all over the country. This work is growing more valuable and important each year; working out new problems in diagnostic and preventive medicine, it is a combination that has wonderful advantages to itself, and to the public at large, and last but not least, to our beloved profession.

It has its own men or employees located as meat inspectors, investigators, and men in the field who are constantly furnishing the laboratories and experimental departments with material, that help reach the results to be obtained that are so beneficial to all.

In addition to this, the members of the entire profession in the United States individually are furnishing material for this large scientific laboratory to work out.

#### STATE MEASURES.

Coupled with this each state has its own form of handling disease and in our own Empire State of New York, under the leadership and direction of Raymond A. Pearson, the Commissioner of Agriculture, our profession has had the consideration it deserved and has for the first time in a decade made some progress from the veterinarians' point of view.

There has been made an official Chief Veterinarian, who has in charge all the sanitary work relative to the contagious diseases in our animal industry within the state.

There has been appointed throughout the state from the civil service list as far as practicable, regular veterinary inspectors and appraisers to test cattle and horses for their individual contagious diseases; condemn, appraise and destroy them and look after the exposed horses and cows; to quarantine dogs for rabies where suspected, look after the transportation of animals, and the inspection of meat and dairy products.

Where the regular candidates for appointment to this work have been lacking in a county or in a city where the regular force was insufficient, the Commissioner has used his prerogative, and exercised his right to deputize the work to a regular and qualified veterinary practitioner; so that as far as possible, the work has been expedited to a great extent.

There is still much to be done along this line to thoroughly eradicate the disease known as glanders, especially in big cities where there is so much to contend with. Constant change of the ownership of horses, the loss of identity, the importation of diseased horses from adjoining states, the crowded condition of our city stables, the careless interchange of harness, nosebags, bedding, brushes and combs, and the common drinking trough in stables, and the public ones in the street, are all factors in propagating this disease.

The administration of the animal indemnity law from Albany so far from the centre of the worst infection, New York City makes its effectiveness that much less.

The lack of sufficient tests, both by the private veterinarian and our state officials, and a proper reporting and recording of those cases reacting, just help keep this disease progressing.

An illustration of what can be accomplished was shown by the report made by one of the veterinarians connected with the Canadian Veterinary General for Canada, in the Province of Manitoba, where in seven years, beginning in 1905, when 871 cases were killed for glanders, 365 of which were clinical cases and the rest killed upon the test. In 1906, 336 were killed, of which 173 were clinical cases. In 1907, 3,065 horses were tested, 199 were killed, 99 of which were clinical and the other hundred were killed upon the test alone, and so the report goes down, the clinical cases and reactors growing less each year until 1911 when 249 were tested and none reacted. Care was observed, however, beginning in 1907 to test every horse coming in the Province.

This shows in a small way what can be accomplished.

On the other hand, the horse that is tested, by any one, and reacts and is not reported, identified, quarantined or killed, becomes a dangerous source of infection and each time he is sold or changes ownership is liable to start a new centre of infection.

The Department of Agriculture, through its Veterinary Bureau, is undoubtedly doing all it can at present with the amount of money appropriated to its use for this purpose.

But the Government as well as the state and municipalities must sooner or later take hold of this proposition in earnest if we ever expect to exterminate it.

The Commissioner of Agriculture saw fit after a conference with a number of leading veterinarians throughout the state to co-operate the state law with the municipal ordinances of this city of New York, so that instead of two departments working at loggerheads, they are now reporting these cases officially to one another so that each may be cognizant of what the other is doing and seeing that none escape, thus insuring a better inspection and an improved condition of quarantining and disinfecting.

#### MUNICIPAL REGULATIONS.

Our local Department of Health in Greater New York is also interested in the contagious disease of animals, but from a different point of view; while our federal and state governments, through their Departments of Agriculture, are mainly interested in the contagious diseases of the animal kingdom from a protective point of the live stock interest and the capital invested, and to save and protect that interest and capital from the ravages of diseases, the Department of Health is interested from the fact that many of the contagious diseases of animals are communicable to man one way or another.

This department has always co-operated with the private practitioner and to his advantage, and is now co-operating with the Department of Agriculture as well.

It is principally interested in glanders and farcy in horses, in rabies in dogs, tuberculosis of cattle, and cattle transportation, in dairy and milk inspection, and a meat and food inspection.

That part of the work that relates to diseases of animals is carried on by veterinarians under a medical chief of a division of contagious diseases. They have been for the last five years much interested in the suppression of rabies and have been taking the hardest, longest and most expensive and unsatisfactory methods possible—the investigation of every dog that bites a person regardless of the cause.

A dairy and milk inspection done principally by laymen under the division looked after by a chemist, a meat and food inspection, whose destinies are controlled by a layman.

There has been, however, a movement on foot recently to appoint veterinarians for the regular meat inspection service at

our local slaughter houses displacing as opportunity offers professional inspectors for laymen.

The one great drawback this sanitary work suffers is the small compensation paid for this work, which requires greater diplomacy in dealing with the public, with more risk and danger from infection to the veterinarian and much more labor than professional work in other city departments which pays considerably more.

I hope to see the day when this work will be conducted from a "Veterinary Division" of this great Department of Health, looked after and conducted by a veterinarian of standing and merit, who will have free hand to take hold and master in our cities some of these veterinary problems.

#### VETERINARY SOCIETIES.

The old adage, "In Unity there is Strength," is fast becoming exemplified in this state from an association or society point of view, as our societies are growing in numbers and strength.

We have first, our own beloved New York State Veterinary Medical Society, then the Genesee Valley Veterinary Medical Association, the Central New York Veterinary Medical Association, the Alumni Association of the New York-American Veterinary College, and last but not least, our Veterinary Medical Association of New York City.

These are all aggressive and growing societies. What they lack in numbers they make up in enthusiasm, and add much to our profession as a whole, and much more to the individuals who are fortunate enough to live within ear-shot or traveling distances of their meetings, and take part in their deliberations.

A state that can brag of five healthy, harmonious veterinary societies is certainly in good shape, from a society standpoint.

We have for the first time this year had printed proceedings of our 1910 session, a copy of which you all have, or will receive upon your return home. This was recommended by my predecessor and carried through by resolution. It remains with you whether you will make this a permanent feature of our society or not, as it is rather an expensive procedure, but to my mind, it is worth it. We have prepared this time to have verbatim reports of all addresses, papers, discussions, etc., by employing in advance a stenographer, accustomed to our nomenclature, so that the report, if it is to be printed, will be complete this year. I personally believe as long as we can afford it, we

should continue this, as it makes an excellent reference book. A full report of this work will be given by the publication committee, which should, in my opinion, be continued in office for at least another year.

In closing my address, I can only repeat what I said when you honored me by making me your president, and that is "the president cannot be the whole society any more than the captain can be the whole ship." It all depends upon the co-operation of the members and other officers and I feel that I have had that in every particular. I felt then as I feel now, that there is no higher honor that one can aspire to, than to be president of this association.

I have endeavored to keep in touch with each member, each committee and each officer during the year, to keep my correspondence up to the day as near as possible, giving due consideration to each question and in turn, placing the facts before the proper committee for their action.

I give my most heartfelt thanks for the work and aid given by your retiring officers and committeemen and the conscientious efforts of them all.

You have selected your officers, and in turn your president selected the committees, the chairmen of which forms the executive committee. This was no easy task, and it took time, care and attention with the aid of the vice-president, who had been our secretary, and was therefore, conversant with the special qualities of the different men. These men have proved a most happy combination for the good of our beloved society.

We have again suffered loss in our midst during the year by the swath cut by the Great Reaper, to which we all as wheat spears must fall. This, too, will be fully taken up by the resolutions of our Committee on Necrology.

In order that our beloved society may prosper, we must interest the young men in the work we have been endeavoring to help, and they in turn will take our places, we hope, for the improvement and lasting good of our society. (Applause.)

After the reports of the various committees had been received and the various business matters of the society adjusted, the following papers were presented:

"Some Observations on the Use of Glanders Vaccine," by Dr. John McCartney; "Torsion of the Intestines," by Dr. J. N. Frost; "The Influence of Legislation Upon the Progress of Veterinary Science," by Dr. W. L. Williams; "Canine Distemper:

Experiments and Observations on the Various Forms of Treatment," by Dr. W. L. Curtis; "Tendo-Vaginitis," by Dr. R. W. Gannett; "Why Improvements of Stallion Service would be an Asset to New York State," by Dr. W. G. Hollingworth; "Formalin and Its Use Intravenously," by Dr. F. E. McClelland; "The Relation of the State Diagnosis Laboratory to the Practitioner," by Dr. V. A. Moore; "Sanitary Production of Milk," by Dr. G. T. Stone; "The Increasing Prevalence of Glanders in New York State," by Dr. J. G. Wills.

The various reports and papers were well prepared, instructive and invariably created interesting discussions.

Clinics were held each evening and the morning of the third day at the Berns Veterinary Hospital, 74 Adams street. At the close of the clinic Thursday afternoon, special cars were in waiting to carry the members, visitors and ladies to Coney Island, where a shore dinner was served. This brought to a close one of the best meetings in the history of the society.

The following officers were elected for the ensuing year:

President, Dr. J. F. DeVine, Goshen.

Vice-President, Dr. W. B. Switzer, Oswego.

Secretary-Treasurer, Dr. H. J. Milks, Ithaca.

It was voted to hold the next annual meeting at Utica.

H. J. MILKS, *Secretary*.

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## ONTARIO VETERINARY ASSOCIATION.

The annual meeting of the above association was held in Toronto on Tuesday, August 22, 1911.

The president, Dr. C. Brind, of Woodstock, opened the meeting at 2 o'clock p. m. In his short address, he explained that in consequence of the annual meeting of the American Veterinary Medical Association being held in Toronto this year, at the present time, it would be best to condense the business of our meeting as much as possible.

The order of business:

First—In accordance with this, it was moved, seconded and carried "That the minutes of the last meeting be approved without reading them.

Second—The secretary reported, a considerable amount of correspondence that had been promptly attended to, especially

several letters relating to unqualified men practising our profession in this Province. With regard to the finances, after paying to the estate of the late Dr. A. Smith the sum of \$50 for money advanced by him some time ago, there was now in his hands and in the Bank of Commerce the sum of \$74.53.

Third—The auditors' report was read by Dr. J. H. Reed. It was moved, seconded and carried that these reports be adopted as read.

Fourth—Mr. A. M. Van Cleaf, V.S., was duly proposed and accepted as a new member of the association.

Fifth—The payment of dues was then called for.

Sixth—No papers were read.

A resolution was carried " That the feelings of regret of the members of the association on the death of the late Professor Dr. Andrew Smith, which sad event occurred since our last annual meeting, should be placed on record, and the secretary was instructed to write a letter of condolence to Mrs. Smith expressing our deep sorrow for her bereavement.

The secretary was also instructed that a letter of condolence be sent to Mrs. Dr. W. Mole, our late vice-president, whose sudden death has only recently occurred.

Dr. C. Elliott, V.S., then brought forward the subject of better legal protection for our profession in the Province of Ontario. He mentioned the fact that this matter had been before the Provincial Legislature for several years, and he could not understand why our bill did not pass, as in private interviews with prominent men it received much encouragement. But it was finally withdrawn.

Dr. J. G. Rutherford, Veterinary Director General, spoke of conversing with members of the house on the bill. He also said that the Legislative Committee of our association met the Hon. Mr. Duff, Minister of Agriculture, on the matter, who gave encouragement.

Dr. Rutherford also stated that he had received a bill of \$500 from Col. Robertson, our lawyer, for his services in connection with the bill. He had therefore written to Col. Robertson and offered him a check for \$250, which was graciously accepted. He further stated that there was still something over \$400 in the Bank at Ottawa for this one purpose and no other, and he urges members of our association to "wake up" and interview their members of parliament continually until our demands are granted. He recommended interviewing the Hon. Mr. Duff, to keep him

alive to the passing of the bill. He claims that the veterinarians of Ontario should devote a certain amount of time and trouble in endeavoring to gain our point.

Dr. Hawkins, V.S., of Detroit, gave a short review of the work done by the Veterinary Association of the State of Michigan, and gave some useful advice as to the course to pursue regarding legislation, which had been so successful in that state.

There was considerable discussion in which several participated, and the feeling of the meeting was unanimous, strongly favoring pushing onward for better legal protection for our profession.

The retiring president, Dr. C. Brind, then vacated the chair in favor of Dr. W. Cowan, the president-elect.

Dr. W. Cowan on taking the chair, thanked the members warmly for the honor conferred, and said he hoped to do his duty as president, and also hoped to get protection for our profession during the coming years. He fully agreed with the remarks made by Dr. Hawkins.

Dr. J. G. Rutherford, on behalf of the American Veterinary Medical Association, invited all members to attend the meetings now in session at Convocation Hall, in this city.

A vote of thanks was tendered to Dr. Brind for his able conduct in the chair during his term of office. In response to which Dr. Brind made a few very appropriate remarks.

A vote of thanks was tendered to the Legislative Committee for the efforts they have made in endeavoring to procure better legal protection for our profession.

Dr. W. Cowan, the president-elect, then asked for the feeling of the meeting in regard to the time or date of our next meeting. This subject was fully discussed. Dr. Elliott, Dr. Rutherford, Dr. J. H. Reed and others taking part in discussing it. It was ultimately moved and carried that Dr. Fowler, Dr. Hurd and Dr. Wilson be appointed a committee to get into communication with the secretaries of the Live Stock Association, and to have a meeting during the week of their meeting.

The following are the officers elected for the ensuing year:

President, W. Cowan, V.S.

Vice-President, C. S. Macdonald, V.S.

Secretary-Treasurer, C. Heath Sweetapple, V.S.

Assistant Secretary-Treasurer, W. J. R. Fowler, V.S..

Directors—E. A. A. Grange, V.S.; C. S. Macdonald, V.S.; G. Coulten, V.S.; C. Elliott, V.S.; W. Steele, V.S.; T. H. Lloyd, V.S.; T. E. Watson, V.S., and T. Babe, V.S.

Auditors—C. Elliott, V.S.; J. H. Reed, V.S.

Dr. E. A. A. Grange, principal of the Ontario Veterinary College, was appointed to represent the association at the Industrial Exhibition.

C. HEATH SWEETAPPLE, V.S., *Secretary.*

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#### UTAH VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the Utah Veterinary Medical Association was held at Salt Lake, October 5, 1911.

Meeting called by Dr. J. H. Halton, president.

Election of new members, the following being taken in: Drs. Vance, Frederick, Egbert, Webb and Williams.

Discussion for schedule of prices; some changes made.

Quackery and unlawful practice taken up; association to work with state for the suppression of same.

Election of officers for following year: H. J. Frederick, president; Walter Emms, vice-president; A. J. Webb, secretary-treasurer.

A special meeting called for next March at Logan. Papers to be prepared and clinic to be held at next meeting.

Meeting adjourned.

A. J. WEBB, *Secretary.*

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#### SOCIETY OF COMPARATIVE MEDICINE OF THE NEW YORK STATE VETERINARY COLLEGE.

The first regular meeting of the above society was held Friday evening, October 6. The newly elected president, Mr. O. B. Webber, presided. The important feature of the meeting was a talk by Dr. V. A. Moore, director of the college, upon "The Meaning and Purpose of the Society of Comparative Medicine," in which he urged that every man registered in the college become a member, and that after graduation, he become a member of the local, state and national societies. This was followed by a social hour at which refreshments were served. At the close of the meeting Dr. Moore extended to the faculty and students a general invitation to his home Friday evening, October 13, 1911.

R. RAY BOLTON, *Corresponding Secretary.*

# AMERICAN VETERINARY REVIEW.

DECEMBER, 1911.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, October 15, 1911.

**ELECTRIC BURNT WOUNDS.**—Notwithstanding all the precautions that are taken, accidents caused by industrial electricity are quite common, and human surgeons as well as veterinarians may daily have occasion to care for patients, subjects of those accidents. They are of two orders: General effects of commotion, varying very much in intensity; sometimes temporary, or again sufficiently severe to kill suddenly, and again local effects to the points of contact of the animal body with the electric current conductors, which consist in burns more or less severe, extensive and deep. These electric burns have clinical characteristics, which are specific, and give them a peculiar physiognomy and evolution, quite different from ordinary burns; and on these accounts, they deserve special attention. It is from the article on the subject written by Dr. Ch. Lenormant that I extract the following points.

The subject has already received the attention of many writers and valuable facts have been advanced relating to these wounds which can be found on any and every point of the body, but whatever be their seat, have characters which belong to them, which differentiate them from ordinary burns; consisting in the

aspect of the lesion, their state of indolency and their aseptic evolution. To veterinarians these will I hope prove of interest.

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The aspect of the lesions varies with the depth of the burn, but is always different from that of ordinary burns. To this point of view they are divided into superficial and deep. The first are rare, consist in small superficial erosions, with irregular edges and corresponding anatomically to the classical second degree of burn wounds; viz., those in which the dermis is not affected.

The very high temperature developed at the point of contact with the electric current gives rise most generally to a massive destruction, a carbonization of the tissues to quite a considerable thickness. Deep wounds for that reason are the most frequent. Their aspects are most characteristic and present themselves as true losses of substance; "craters" like, deeply hollowed in the teguments and tissues underneath. These losses of substance varying in extent, sometimes linear when due to a wire of small dimension, have an irregular, blackish bottom, with little dark red spots; their borders regularly cut are perfectly distinct from the surrounding tissues and there is never any indication of inflammatory reaction; "there exists no progress of intensity in the size of the burn, which forms a homogeneous mass evenly modified in all its parts: and which so to speak is buried in the middle of healthy tissues."

It is not rare for the carbonization to go beyond the teguments and reach also the tissues underneath. Tendons and muscles are then also destroyed and more or less severe sequelæ and malformations may follow. Bones themselves are often involved, when they are covered only by a thin layer of soft parts. In these cases necrosis of more or less severe nature may be the result.

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Indolence is the second essential character of electric burns and it is perhaps the most unexpected and the most spe-

cific, if one takes into consideration the severity of the pain caused with ordinary burns. Whatever may be the manner in which this symptom is interpreted, whether it is attributed to the destruction of nervous termination or to the aseptic condition of the lesion, it is almost always constant and recognized by all authors.

It can be easily demonstrated. The indolency is such that in human surgery, some wounded persons did not know that they had been injured. A man who had been extensively burned on the face did not realize it until he looked at himself in a looking glass. Another went home after the accident, saw that his clothes had been burnt, and only then found that he had a deep wound on the forearm under them.

This indolence exists only for wounds produced directly by the electric current and it is very curious to observe that when the clothes of the wounded have been burnt, the secondary lesions so produced are then very painful and in contrast with the painless condition of the burns situated on the very points of application of the current.

Finally the last character distinguishing electric from ordinary burns is an *aseptic evolution*; there is no inflammatory reaction, suppuration is absent, the carbonized tissues slough little by little and without the interference of any infectious phenomena. This, so remarkable aseptic evolution, is undoubtedly the result of the massive sterilization of the tissues by the very high temperature produced on the level with the penetration of the current. It has interesting consequences to the point of view of the repair of those electric lesions. Superficial burns cicatrize rapidly, with a regularity and a perfection sometimes marvelous. The cicatrix is smooth, supple, white and never has the shrunk, rough aspect, retractibility and abnormal cicatrization of ordinary wounds. When the wound is deeper, repair can also go on quite easily. The scab contracts, sloughs out and leaves a smooth surface which rapidly cicatrizes entirely.

However, there are instances where on account of losses of substance a slow cicatrix takes place only after months. Such is the case when there has been complication of bony necrosis.

There is also another character which can be considered as special to electric burns, it is the absence of general accidents which frequently complicate ordinary burns.

This principally refers to patients of the human family, however, if phenomena of shock, visceral congestion and vascular thrombosis, etc., have not yet been mentioned, it is probably due to the fact that electric burns are ordinarily quite limited in their surface, notwithstanding their depth and that in the pathogeny of those general accidents, the extent of the wound is all and the depth nothing.

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INFECTIOUS OSTEITIS OF CATTLE AND HORSES.—Under the name in the *Journal de Zootechnie*, Doctor A. Baumgartner has called the attention upon a morbid entity which is not rare and yet upon which bibliographic information is comparatively meagre. It is indeed a primary infectious osteomalacia, which has not entirely escaped attention, and to which Fröhner, Blain, De Does, Ziemsen and others have made some allusions.

Baumgartner has made a number of private observations amongst young bovines, principally in those aged from six months to three years and in which he has noticed the following symptoms:

“When the bones of the extremities are affected, the first manifestation of the disease is lameness of one or several legs, with difficulty in carrying weight. Slight, insidious and intermittent at first, this lameness soon becomes more marked and chronic. It seldom occurs suddenly or if it does the animal is unable to stand up. In all the cases the characteristics of the lameness consists in the stiffness of the leg, and resting on the toe. Walking is stiff and painful. The back is arched. The animals avoid standing and prefer lying down. Careful examination of the legs reveals no localized pains, no swelling of the articulations; although sometimes pressure and percussion on the superior extremities of the bones seem to be painful. In a few cases, on those regions slight swellings of the subcutaneous tis-

sue may be observed. Abscesses may also be present and the pus has a bad odor.

“ Sometimes, however, the primary lesion is located in the vertebræ and on that account stiffness and immobility of the vertebral column is noticed; extending perhaps to paralysis of a portion of the trunk. The pulse is always much accelerated, temperature raised up to 41 or higher, there is great fever and yet notwithstanding this hyperthermia, appetite and digestion remain good. Nevertheless loss of flesh is soon manifested and general muscular atrophy becomes marked more and more so.

“ Spontaneous recovery is possible in mild cases, but death by cachexia often follows after a year.”

The study of the pathology of this affection has been carried out by Prof. Guillebeau and besides the bony lesions of osteitis and osteoporosis that he has found, he has also invariably noticed by microscopic examination, the presence of the bacillus of necrosis (bacillus necrophorus of Flugge), to which is undoubtedly due the osteoporosis and progressive necrosis observed.

The treatment recommended by Baumgartner consists either in injection of iodipaine or the internal administration of iodide of potassium. Associated with massage this treatment has obtained radical and complete recoveries in the majority of cases where he employed it.

The conclusions of Baumgartner are:

“ 1. There is often observed in horses and in cattle an osteitis and an osteomyelitis, very painful, due to the invasion of the bacteria of necrosis either alone or in symposium with a coccus taking the Gram. 2. This infection gives rise to a marked lameness; too frequent pulse and sometimes fever. 3. In some cases there is formation of abscess. 4. On the bony tissue, the disease has a destroying character, without formation of secondary abscesses. There is never increase of size of the bone; sometimes there is great soreness on pressure. 5. The disease is always of long duration. 6. Iodine treatment has a great beneficial effect. 7. To this date most cases of this disease have been considered as rheumatism.

NEW APPLICATION OF SCOPOLAMINE AND MORPHIA IN LARGE ANIMALS.—*Scopolamine* or *hyoscine* is an alkaloid obtained from *hyoscyamus*, plant of the solanaceous family, and which comparatively has recommended itself in human medicine by its hypnotic properties; which, somewhat highly praised by some, are, however, considered by other as limited. The action of scopolamine, according to therapeutists is analogous to that of atropine. It produces mydriasis, accelerates the heart's action by paralysis of the pneumogastric, reduces the salivary secretion and perspiration, and paralyzes intestinal peristaltism. It differs from atropine in accelerating the respiration only slightly, because of its mydriatic action being more powerful and quicker and producing a great vaso-dilatation towards the kidneys. During the action of scopolamine, animals, especially dogs and horses, are very restless; they present a certain auditory hyperesthesia and weakness of sight. In man, the bromidrate of scopolamine given in very small doses produces a slight hypnotic action, which, says Kaufman, is not observed in animals. And yet in those, as well as in man, chloroformic anesthesia is obtained much more rapidly when an injection of scopolamine has been previously made. On account of this, a method of mixed anesthesia with both chloroform and scopolamine is often resorted to; although its combination with other hypnotics, either morphine, chloral, cocaine, etc., have also had their advocates, experience having demonstrated that the use of the pure alkaloid alone presented too serious objection.

The adjunction of morphine to scopolamine is the mixture most generally used by many and if it has not been resorted to oftener in veterinary medicine, it ought to be for the narcosis that it produces can be of great advantage.

Doctor Arturo Kisavelli in the *Nuovo Ercolasis* calls the attention to the good results he has obtained by producing a state of semi-narcosis in the treatment of prolapsus uteri of the large animals, cows and mares. And while the number of cases in which he has used it is rather small, the results having always been crowned with success they deserve attention; especially from

the fact that the condition of the animals was quite serious, assuming as he says, the third degree of prolapsus established by Prof. Vachetta; namely the uterine mass protruding very extensively and being complicated with eversion of the organ. The preparation Dr. Kisavelli used is composed of: Bromidrate of scopolamine 5 millig., chlorydrate of morphia 30 centig., sterilized chloride of sodium 18 centig., distilled sterilized water 20 c. c. The application consists in two injections of 10 c. c. on each side of the neck or on the croup; the second being made a short time after the first and when the prolapsing organ has been cleaned and the reduction is about being made.

Shortly after the injections the animal becomes quiet, drops into a state of semi-narcosis which facilitates enormously all the manipulations which sometimes are required. This semi-narcosis lasts generally between half an hour to two hours, no bad effects follow and the reduction remains permanent. The application of a bandage is, however, a wise precaution. Doctor Kisavelli records seven cases treated in cows; with the exception of one that died from septicæmia, all recovered. A similar success resulted in two mares.

In conclusion of his article, the Doctor says: Small doses of scopolamine associated with morphine produce in bovine and equine animals a state of semi-narcosis similar to those produced in human patients; such a state can be taken advantage of in veterinary obstetrics in the reduction of uterus with prolapsus by quieting and reducing the expulsive efforts of the animal; the use of scopolamine in small doses is not followed by any alteration or disturbance whether immediately or afterwards.

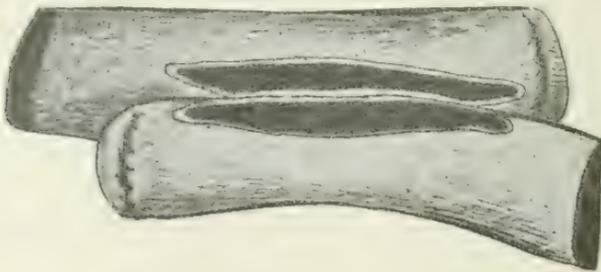
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LATERO-LATERAL ANASTOMOSIS AFTER ENTEROTOMY.—Generally speaking, intestinal surgery, and principally that referring to enterotomy has found in veterinary medicine but few applications. Perhaps in small animals the attempts have been more frequent. And yet with the comparative safety offered by aseptic measures there seems to be no reason why they should not be more frequent.

For Doctor Umberto Maggi the principal objection to the admission of this surgical interference, is the post-operative stenosis of the intestine which is likely to follow on account of the method in which the resection of the intestine is performed. It is indeed likely to occur when one takes in consideration that the resection being made, either circular or oblique, with following sutures à la Lembert or Czerny or perhaps with the aid of the button of Murphy, as practised in human surgery, there is at the point of cicatrization the formation of a cicatricial ring, which after a certain length of time is liable to contract and give rise to complications which may in many instances prove fatal. This contracture of the intestine brings about a condition of stenosis which he describes as latero-lateral entero-anastomosis after in large animals, the intestines being of much smaller dimensions.

It is to avoid this bad result that taking lessons of what is done in human surgery, Dr. Maggi in *Il Nuovo Ercolasis*, relates the application that he made of this method in several cases and which he describes as latero-lateral entero anastomosis after intestinal resection in small animals.

The operation is comparatively simple. After resection of the portion of intestine which is to be removed, each of the di-



Scheme of the incisions and sutures.

vided portion of intestine, true intestinal stumps, are carefully closed with sutures. On the sides of the two intestinal segments, an incision is made, as near as possible of each other, measuring the same size and then sewed together so as to re-establish a direct passage between the two parts of the intestine. It is essential that the stumps be sufficiently closed to the extremities

of the new opening, although in opposite direction to each other to avoid the formation of too large a cul-de-sac where intestinal matter might collect.

With this *modus operandi*, Maggi has operated experimentally upon 10 dogs, of various ages and size and weighing between 7 and 20 kilog., anastomosing in some portions of the small intestines together, in some the large. With the exception of the first dog that died from peritonitis, because of deficiency in the technic of the operation, all the others recovered. Destroyed at various times, from about 15 days after the operation to about six months, their post mortem showed a solid cicatrization and a perfect free passage at the point where the entero-synthesis had been performed.

Since these experiments, Dr. Maggi has had opportunity to resort to the operation in many instances and speaking in favor of the method concludes that it presents three principal advantages:

1. Avoids the common complications that follow the operation performed with a circular suture.
2. To always leave the calibre of the cavity of the intestine double in size.
3. To allow the reunion of segments of intestines even when of different dimensions.

\* \* \*

MICROBES IN EGGS.—Most of the writings published upon the bacteriology of eggs relate to those whose contents were abnormal. Schrank, Zorkendorfer have specially studied the microbes of rotten eggs. The microbial flora of eggs, microscopically unaltered, seems less known. Barthelemy has mentioned the microbe of chicken cholera in the eggs of hens suffering with that disease and the same observation was made by Celli and Marchiafava. Gaertner, studying experimental tuberculosis of canaries has related that some of their eggs contained tuberculous bacilli. Artault has inoculated tuberculosis to rabbits from the contents of eggs with unknown origin. The investigation of Cao having for object the study of the permeability of the shell

for micro-organisms made him examine eggs of healthy hens, as they were laid, and then at periods further and further apart until the phenomena of putrefaction appeared.

Mr. A. Chretien, in *Hygiene de la Cande et du lait*, has related the experiments which he has made on this question of the presence of micro-organisms in eggs which had been laid for a certain time, but presented no character justifying their being taken away from use. For instance: *The air chamber, a little larger than in freshly laid eggs, may even in some occupy one-third of the total volume of the egg the internal shell membrane, at the level of the separation of the air chamber and the albumen, undergoes lateral displacements when the egg is slightly shaken. The yelowe is relatively mobile in the middle of the white, which is less gelatinous, but there is no adherence of the yellow to the shell membrane.*

Eggs in these conditions, although not certainly fresh, have undergone only little changes. They are old but not rotten eggs.

From his careful investigation, Mr. Chretien gives the following record of the micro-organisms that he has found: Bacterium-coli, 31.57 p. per cent.; streptococci, 22.36 p. per cent.; staphylococci, 21.05 p. per cent.; bacillus fluoriscens non-liquef., 10.52 p. per cent.; chromogenous microbes, 7.89 p. per cent.; paracoli, 3.04 p. per cent.; undetermined microbes, 11.84 p. per cent.

\* \* \*

Among these micro-organisms, the coli-bacilli and those of the same group, although rarely virulent, deserve attention on account of the part they generally take in alimentary intoxications.

Mr. Chretien concludes in saying that it is difficult to tell the exact origin of those various microbes. Zimmermann has demonstrated that the egg can be infected during its formation in the oviduct; Zorkendorfer and Schrank have succeeded in realizing the entrance of bacilli through the shells. These two modes of infection take place certainly and if a certain number

of freshly laid eggs are free from germs, they are very much exposed to becoming infected during the numerous manipulations they pass through before they are to be consumed.

\* \* \*

BIBLIOGRAPHIC ITEMS.—The twenty-sixth annual report of the Bureau of Animal Industry for 1909 has been issued. Besides the excellent report of Chief Melvin, it contains among many articles of interest, some very essential from the veterinary point of view; namely, "A Study of Surra found in an importation of cattle, followed by prompt eradication," two valuable articles on the "Viability of tuberculosis bacilli in Butter and in Cheese" and one on the "Nature, cause and prevalence of rabies." All those by Dr. John R. Mohler, the Chief of the Pathological Division and his assistants. There is also a concise article from A. R. Lee, Junior Animal Husbandman, on "The Ostrich Industry in the United States." A number of plates illustrate the various articles.

\* \* \*

PUBLICATIONS AND PAMPHLETS ACKNOWLEDGED.—Veterinary Notes, of September, 1911, Parke, Davis & Co.; Annual Report of the Chief of the Cattle Bureau to State Board of Agriculture of Massachusetts for the Year 1910; Disease in Sheep (Bottle Jaw) by E. A. Weston, G.M.V.C. and B.N.Sc.; Mulford's *Veterinary Bulletin* for July, 1911.

A. L.

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### CORRESPONDENCE SCHOOLS.

On page 357 of this issue of the REVIEW an article appears from the pen of our esteemed collaborator, Dr. D. Arthur Hughes, entitled "*How They Study Veterinary Anatomy and the Practice of Veterinary Medicine by Correspondence.*" Dr.

Hughes begins his article by stating, "The correspondence schools are still with us." That, unfortunately, is true. He then gives the course of instruction *verbatim*, as given in the advertisement of one of the schools, which had fallen into his hands. The ridiculous statements made by the advertisers certainly warrant Dr. Hughes' final comment: "We should stop such fakes, even if a trip-hammer is needed to do it." As further evidence of the affront to the veterinary profession that the persistent existence of these so-called schools is, we have published in this same number, on page 388, under the head of Correspondence, a letter from the president of the Texas Board of Veterinary Medical Examiners to the REVIEW, together with one from an applicant for license to practice in that state, addressed to the president of the board. (It will be remembered in connection with Dr. Watson's statement in said letter to the REVIEW (*i. e.*), "*I enclose a copy of the act,*" that Attorney General Woodward's translation of the Texas Practice Act was published in the August number of the REVIEW, page 611.)

While we are certain that the veterinary profession, as a whole, fully appreciates the incompetency of correspondence schools to impart knowledge on veterinary science for the very good reason that they themselves do not possess it, yet we believe it will do no harm for its members to see for themselves an example of the brilliant accomplishment in that line, as evidenced by the character of the application for license to practice, referred to. This applicant, according to his own statement, has had the benefit of the tuition of four such institutions, three of which he says have granted him diplomas, and speaks of having "taken the course" in the fourth. Incidentally, it is a powerful object lesson, demonstrative of the benefit of entrance requirement in legitimate veterinary institutions; for no veterinary school, no matter what its teaching facilities might be, could do anything with that sort of material. Unquestionably the veterinary profession is a unit in its condemnation of these counterfeit institutions and desires their extinction; which, of course, must come about *eventually* by a process of evolution and elim-

ination, as each state finds itself in a position to prevent their "graduates" (pardon the use of the term) from practicing within its confines; but we believe their extinction can be expedited by a little activity in the way of ferreting them out and taking advantage of the United States postal laws, which forbid that fraudulent business be conducted through the mails. As to whether or not the same thing applies to the Canadian postal laws, we are not positively posted; but think that it does not.

We are glad that so energetic a member of the profession as Dr. Hughes has attacked the situation, and assure him that we are in thorough accord with him; and will aid him in any way that we can, whether it be the "trip-hammer" method or some other.

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#### THE A. V. M. A. IN INDIANAPOLIS IN 1912.

Indianapolis has been predicted as the next meeting-place of the AMERICAN VETERINARY MEDICAL ASSOCIATION since the closing days of the Toronto meeting; and the REVIEW now takes pleasure in officially announcing that it will be held in the city of Indianapolis, Indiana, in the week beginning August 26, 1912. Indiana is a fertile farming state and, consequently, rich in veterinarians. The host city, the capital of the state, is fast approaching the century mark in years of existence and is therefore rich in educational institutions, and is altogether a happy choice. Indiana ranked among the big states in attendance at the last A. V. M. A. meeting, being fourth on the list. Besides, it is in the middle West, the home of the large live-stock markets, the large veterinary educational institutions, and the largest number of veterinarians to a square mile of any other part of the country. We believe that the association will be benefited by a visit to the "Hoosier" state and that the state will be benefited by a visit from the association. Already, then, the campaign is started for the 1912 meeting of the A. V. M. A. at Indianapolis, and there should be no relaxation of effort to make it the biggest meeting in every sense ever yet held, until the president's gavel falls at its opening.

INAUGURATION DINNER TO NEW YORK UNIVERSITY'S NEW CHANCELLOR.—As a fitting close to the week's activities at New York University in honor of the installation of Elmer Ellsworth Brown, LL.D., as seventh chancellor of New York University, a dinner was held at the Hotel Astor in New York City, on the evening of November 9. Rev. George Alexander, D.D., was president of the dinner. The invocation was given by Rev. Nehemiah Boynton, D.D., and the dinner president then introduced the new chancellor and the following speakers: Paul Henry Hanus, B.S., LL.D., delegate from Harvard University; Arthur Twining Hadley, LL.D., president of Yale University; William Francis Magie, Ph.D., delegate from Princeton University; Nicholas Murray Butler, LL.D., president of Columbia University, and Jacob Gould Schurman, LL.D., president of Cornell University. Dr. Brown came to New York University from the head of the United States Department of Education at Washington, D. C., and President Taft wired his regrets at not being able to be present at the dinner, and paid Chancellor Brown the compliment of saying that the government had lost an efficient official when New York University acquired Dr. Brown as its chancellor. All the schools were represented in his honor; nearly seven hundred being seated at the seventy-nine tables in the beautiful ballroom of the Hotel Astor. The Veterinary School was represented by the following gentlemen: W. J. Coates, '77 (grad.), dean; H. D. Gill, '84 (grad.), faculty; John F. Winchester, '78 (grad.); Wm. Dougherty, '74 (grad.); W. Horace Hoskins, '81 (grad.); J. Elmer Ryder, '84 (grad.), faculty; P. Burns, '88 (grad.); Joseph Ogle, '89 (grad.); Robert Dickson, '92 (grad.); W. C. Miller, '01 (grad.); Robt. W. Ellis, '89 (grad.), faculty; W. Reid Blair, '02 (McGill), faculty; Wilfred Lellmann, '93 (Berlin), faculty. The reunion was a pleasant one; some classmates meeting for the first time in nearly a quarter of a century.

THE NATIONAL HORSE SHOW AT NEW YORK.—From the time the horse made his bow before the footlights in Madison Square Garden, New York City, on Saturday, November 18.

until the final curtain, late in the evening of the 25th, he occupied the centre of the stage, and was the admired of all admirers. Some of the features in relation to the recent horse show to be recalled with satisfaction are, that the show was the greatest from the point of entries and classes, of any previous one during the past twenty-seven years; the Garden looked better than it has ever looked before, and there seemed to be a sort of general revival of interest in the horse. And, if we are to accept the time-worn remark, "one is judged by the company he keeps," then the horse must be given first place. For it is a noteworthy fact, that whenever or wherever the horses hold their conventions, be they county, state, national, or international, the very best people in the land flock to them and participate in their activities. And, while many go because it is fashionable and seems to be "the thing to do," the great majority are undoubtedly attracted because of their genuine interest in the horse, and because of their realization of the importance of the horse industry in the field of agriculture. The interest shown in the officers' chargers and in cavalry horses generally, as indicated both by the prominent place they occupied in the program and the attraction they had for the spectators, suggests the realization on the part of the public of the importance of that class of horse. A class of horses that should not be neglected in this country; for, while they can play other rôles satisfactorily in times of peace, no twentieth century mechanical device could possibly replace them on the battlefield. And so with the police mounts, which attracted even more attention during their maneuvers than did the chargers; nothing can ever satisfactorily fill their place. And with the draught horse, so much in demand; great interest was shown in the wonderful examples of careful breeding that were exhibited. Prominent among them the beautiful dapple gray four-year-old Percheron stallion, "Hautbois," standing 17 hands high and weighing 2,310 pounds. A strong, active breed of horses with tractible manners and good tempers. Another extremely useful breed of horses that were very much appreciated at the show, and should be more generally used on the road by veterinarians and others instead of automobiles, is the

English hackney. This grand little type of horseflesh, full of courage, style and endurance, won thirty-five first prizes in open harness classes, including six championships; while the native breed won six firsts and one championship. In eighteen classes, the hackneys won every blue ribbon. Another excellent type of road horse that again seems to be coming up, is the Morgan horse; a horse that at one time filled the same place in this country as that occupied by the hackney in England. Some splendid types were exhibited. The pony classes, too, were evidences of the care that has been devoted to perfecting that diminutive but courageous equine type. The pony four-in-hand caused delight in the hearts of the juvenile audience which was gathered into the Garden for the opening from the various institutions in the city. Twenty-five hundred of them were present, and occasionally they gave "*voice*" to their appreciation of some clever act on the part of the ponies which were exhibited in the arena for their especial entertainment. The classes of harness horses, both light and heavy, roadsters, trotters, thoroughbreds, polo ponies, pony hackneys, etc., were well represented, both numerically and from the standpoint of quality, and altogether the NATIONAL HORSE SHOW ASSOCIATION OF AMERICA merits recognition as an educational institution; whose perpetuation is assured through the loyalty of its officers, who assure us, that even if its 28th annual show is not held in the old Garden, of which its followers have become so fond, it will be held in a place equally suited to all its requirements; and that the outlook for next year's show is, that it will be better than it has *ever* been. All hail the horse!

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N. B.—THE NEW POSTAL LAWS.—AN EXPLANATION: The new postal laws governing second-class mail matter, requiring it to be carried to and from certain points by "fast freight" instead of mail trains as heretofore, was suddenly "sprung" upon us on our mailing day for last month's issue; so that the copies reached our subscribers about five days late; we having had no opportunity of preparing for it ahead of time, and no way of obviating it at the time. We offer this explanation in the form

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of an apology for last month, and ask your indulgence for the present month, which again reaches you a little late, and promise you that after this month, with your help, to again get back to our regular time. *How can you help us?* You can help us by sending in your contributions, reports of meetings and any data that you desire to have appear in the next issue, four or five days earlier than you have been accustomed to doing, as we will be obliged to mail four or five days earlier in order to deliver at our accustomed time. *Try and get data to us by the 15th of the preceding month when possible to do so.*

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A DINNER TO DR. BRENTON—A number of the close personal friends of Dr. S. Brenton, of Detroit, expressed their recognition of his sterling qualities as a man among them, and their appreciation of the honor conferred upon him by the AMERICAN VETERINARY MEDICAL ASSOCIATION, in electing him its president, at the Toronto meeting, by giving a dinner in his honor on the evening of November 17, at which time they presented him with a loving cup, upon which were engraved the following names: Drs. H. S. Smith, J. W. Brodie, F. M. Blatchford, E. B. Cavell, G. W. Dumphy, J. Hawkins, W. L. Brenton, Thos. Farmer, J. J. Joy, W. A. Giffin, W. A. Ewalt, Geo. D. Gibson, J. C. Whitney, J. Black, Jas. Drury, R. P. Lyman, A. M. Kercher, Wm. Jopling, F. L. Baldock and Robt. J. Morrison. The committee in charge of the dinner were Drs. Black, Dumphy and Hawkins. The presentation was made by Dr. J. B. Kennedy, (M.D.) who, in tendering the cup to Dr. Brenton, spoke of his sterling qualities, his earnest efforts and his accomplishments for the elevation and advancement of his profession. It was a complete surprise to Dr. Brenton, who expressed his deep appreciation of the honor he realized that his brothers in the profession had paid him in giving him the dinner and presenting him with the beautiful souvenir of the occasion. Among the other speakers were: Dr. Dumphy, Rochester (Mich); Dr. J. V. Newton, Toledo (Ohio); Dr. P. H. Shepherd, Cleveland (Ohio); Prof. R. P. Lyman, dean of the Veterinary Department of the Michigan Agricultural College, East Lansing; Prof. Charles Marshall, of the Michigan Agricultural College, and Dr. J. Hawkins, Detroit. It is needless to add that the occasion was a most enjoyable one, both for the guest of honor and all present.

## ORIGINAL ARTICLES.

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### THE EFFECT OF NUCLEIN ON THE BLOOD.\*

By B. F. KAUFF, M.S., D.V.S., PROFESSOR OF PATHOLOGY, DIVISION VETERINARY SCIENCE, COLORADO STATE COLLEGE AND PATHOLOGIST TO THE COLORADO EXPERIMENT STATION.

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Nuclein is an organic body contained within the nuclei of cells. It is acid in reaction. In composition it has been placed between proteid and nucleinic acid. It contains from three to ten per cent. phosphorus. When combined with albumen it is sometimes spoken of as a nucleo-proteid. Physically it is an amorphous substance. On boiling with alkalis phosphoric acid is set free. After the isolation of the nuclein from albuminous material, with which it is associated, by artificial digestion of the proteid, the nuclein is brought into solution by potassium hydroxide. The nucleinic acids of all nucleins are the same, but the basic portions differ in the different nucleins. The basic substance, on decomposition, yields one or more of the xanthin bodies. As a rule nucleins are insoluble in dilute acids, but soluble in dilute alkalis. Vaughn states that as a result of this phase they resist peptic digestion and by artificial digestion, on account of this resistance, may be separated from most proteid bodies. Paranuclein is said to be an antecedent of nuclein. Histologically and functionally while they appear to be nucleins, yet they do not yield xanthin bases as adenin, guanin, sarcin and xanthin as do true nucleins. When a nucleo-proteid substance is subjected to a peptic digestion, the albumin is converted into peptone and the nuclein forms an insoluble precipitate.

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\* Section 5 of special reports of Committee on Disease, American Veterinary Medical Association, Toronto, August 22 to 25, 1911.

As stated above nuclein is obtained from many sources. Meischner first studied nuclein about the year 1874 and gave to this substance the name nuclein. He obtained it from the yolk of eggs. Hoppe-Seyler was the first to prepare nuclein from yeast. Lubarin was the first to prepare nuclein from casein of milk. Polsz was the first to prepare nuclein from the blood corpuscles of birds. Commercially nuclein is prepared either from yeast or the germ of wheat.

Vaughn has successively used nuclein in the treatment of tuberculosis in persons.

Ferguson has successively used nuclein in progressive anemia.

Jacobsohn makes report of treatment of diphtheria, scarlet fever and measles in people and reports good results.

Excellent results have been repeatedly reported in the treatment of canine distemper.

Hiss and Zinsser report excellent results with the use in the human family of leucocyte extracts. In the general summary and discussion of their lengthy article on their experiments we find the following of interest: Leucocytes play a dominant part in the protection of the animal economy; a part, which in many infections, especially those in which poisoning is supposed to depend on endotoxins, necessitates the direct intervention of the leucocytes themselves between the invading micro-organism and their poisons and the more highly specialized cells of the animals.

Animals suffering from severe septicæmias and poisonings following intravenous injections of such organisms as staphylococci, strepococci, pneumococci and meningococci, have shown beneficial results of treatment with extract of leucocytes, and have, in many instances, survived infections fatal to the control animals in thirty-six hours, even when treatment has been delayed as late as twenty-four hours.

The action of the extracted substances is evidenced in many instances by the marked fall in temperature, and by a conservation of rapid return to normal of the animals' weight. One carefully following the experiments and noting the immediate effect on the temperature and the conservation and quick return to

normal weight of the normal animals must conclude that the principal substance at work is one active in neutralizing poisons, and thus able to relieve the animal economy and give the phagocytizing cells an opportunity to carry on their work of ingesting the germs and thus permanently render them harmless.

Freshly obtained living leucocytes when introduced into an infected animal, even intraperitoneally, are practically without effect on systemic infection. The lives of the animals are not lengthened and these intact leucocytes seem to have no influence on the temperatures.

The experiments conducted in this laboratory were for the purpose of determining the following points:

- 1st. The effect of nuclein on erythrocytes.
- 2d. The effect of nuclein on the hemaglobin.
- 3d. The effect of nuclein on the time of coagulation.
- 4th. The effect of nuclein on the power of phagocytosis.
- 5th. The effect of nuclein on leucocytes, both in quantity and differentially.
- 6th. The effect of nuclein *in vitro* on the power of phagocytosis.

The nuclein used in these experiments was that made from the germ of wheat.\* Each ounce of the nuclein solution contains approximately 6 grains of sodium tritico-nucleinate. The solution is standardized to a content of one milligram of organic phosphorus to each c. c. of solution.

Case No. 2 gives a good illustration of the effects of the results on normal rabbit.

From a study of this table it will be seen that there is an increase in the total number polymorphonuclear leucocytes. No nuclein was given till noon of the fifth day. Not much change in the total number of leucocytes was noted till about the fifth day after the commencement of the giving of the nuclein. A marked increase of the polymorphonuclear leucocytes at the expense of the lymphocytes took place much earlier. With the

\* The nuclein was that prepared by the Abbott Alkaloidal Co., Chicago, Ill.

discontinuance of the administration of the nuclein the total number of leucocytes soon returned to normal. This will also be noted to be true of the polymorphonuclear leucocytes. There was no effect upon the red blood cells.

*Case No. 2.*

| Date.      | R. B. C.  | W. B. C. | Poly-morphs. | Lym-phos. | Monos. | Eosins. | Mast. | Remarks.  |
|------------|-----------|----------|--------------|-----------|--------|---------|-------|---|
| 2, 3, '11  | 6,080,000 | 9,000    | 24           | 76        | ..     | 4       | 5     | No nuclein before count for five days. Beginning at 1 p. m. on fifth day 1 c.c. nuclein was given subcutaneously three times a day, so that on the fifth day two injections were given. No more nuclein was given after the 15th. |
| 2, 4, '11  | 4,160,000 | 8,000    | 36           | 72        | 1      | 3       | 1     |   |
| 2, 5, '11  | 6,116,000 | 8,000    | 30           | 70        | ..     | 3       | 3     |   |
| 2, 6, '11  | 6,296,000 | 8,000    | 28           | 71        | 1      | 5       | 2     |   |
| 2, 7, '11  | 6,220,000 | 9,000    | 22           | 78        | ..     | 4       | 2     |   |
| 2, 8, '11  | 5,556,000 | 10,000   | 34           | 66        | 2      | 3       | 2     |   |
| 2, 9, '11  | 5,810,000 | 10,000   | 30           | 69        | 1      | 5       | 1     |   |
| 2, 10, '11 | 6,080,000 | 9,000    | 44           | 55        | 1      | 4       | 1     |   |
| 2, 11, '11 | 6,720,000 | 11,000   | 34           | 66        | ..     | 4       | 2     |   |
| 2, 12, '11 | 5,400,000 | 11,000   | 23           | 77        | ..     | 2       | 1     |   |
| 2, 13, '11 | 6,200,000 | 21,000   | 63           | 36        | 1      | 3       | 1     |   |
| 2, 14, '11 | 5,440,000 | 25,000   | 52           | 48        | ..     | 5       | ..    |   |
| 2, 15, '11 | 5,360,000 | 20,000   | 38           | 61        | 1      | 2       | 1     |   |
| 2, 16, '11 | 6,000,000 | 15,000   | 33           | 67        | ..     | 3       | 1     |   |
| 2, 17, '11 | 5,920,000 | 11,000   | 26           | 74        | ..     | 3       | 1     |   |
| 2, 18, '11 | 6,080,000 | 11,000   | 34           | 65        | 1      | 1       | 1     |   |
| 2, 19, '11 | 6,320,000 | 10,000   | 32           | 68        | ..     | 4       | ..    |   |

Case No. 3 was for the purpose of making a study to note the effect of nuclein on the blood in canine distemper.

The subject was a Russian wolf hound pup about four months old.

He entered the hospital February 22, 1911.

History: Two weeks previous he was noted to be ill. There appeared a conjunctivitis, a thin, watery discharge was noted, later muco-purulent which has a tendency to agglutinate the lids. About this time a thin, watery and later a muco-purulent discharge was noted from the nostrils.

Symptoms: Appetite little impaired. Great prostration. Wabby gait. Particularly weak and wabby in the hind quarters. First sign of chorea. Very thin in flesh.

In a summary of the above case it will be noted that a marked increase in the total number of leucocytes was observed at the end of twenty-four hours.

The nuclein was always given subcutaneously.

There was very little change in the number of polymorphonuclear leucocytes in this case.

The leucocyte content of the blood remained high after the nuclein had been discontinued eight days.

There was no change in the number of red blood cells.

This dog received no other treatment and steadily improved from the beginning of treatment. The corea entirely disappeared.

It is conceded by the five veterinarians practicing at this institution that prognosis was very unfavorable in this case and as no other treatment was administered recovery must be attributed to the nuclein.

### Case No. 3.

| Date.      | R. B. C.  | W. B. C. | Poly-morphs. | Lym-phos. | Monos. | Eosins. | Mast. | Remarks.   |
|------------|-----------|----------|--------------|-----------|--------|---------|-------|--|
| 2, 22, '11 | 5,516,000 | 7,000    | 79           | 14        | 6      | 1       | ..    | Count before injection of nuclein. Beginning 1 p. m. 4 c.c. was given subcutaneously three times a day, so that the first day only 4 c.c. was given. No nuclein was given after March 7, 1911. |
| 2, 23, '11 | 6,430,000 | 14,000   | 82           | 13        | 2      | 1       | 2     |  |
| 2, 24, '11 | 6,770,000 | 14,000   | 73           | 26        | ..     | ..      | 1     |  |
| 2, 25, '11 | 5,600,000 | 16,000   | 74           | 19        | 3      | ..      | ..    |  |
| 2, 26, '11 | 6,420,000 | 14,000   | 73           | 23        | 3      | ..      | 1     |  |
| 2, 27, '11 | 6,316,000 | 20,000   | 74           | 23        | 1      | ..      | 2     |  |
| 2, 28, '11 | 6,140,000 | 18,000   | 67           | 25        | 4      | ..      | 4     |  |
| 3, 1, '11  | 5,820,000 | 16,000   | 71           | 26        | 1      | ..      | 2     |  |
| 3, 2, '11  | 6,142,000 | 13,000   | 77           | 18        | ..     | 1       | 4     |  |
| 3, 3, '11  | 5,948,000 | 16,000   | 76           | 18        | 1      | ..      | 3     |  |
| 3, 4, '11  | 6,000,100 | 15,000   | 77           | 19        | 2      | 1       | 1     |  |
| 3, 5, '11  | 6,436,000 | 14,000   | 76           | 20        | 2      | ..      | 2     |  |
| 3, 6, '11  | 6,628,000 | 13,000   | 79           | 18        | 2      | ..      | 1     |  |
| 3, 7, '11  | 6,712,000 | 11,000   | 81           | 17        | 1      | ..      | 1     |  |
| 3, 8, '11  | 6,864,000 | 12,000   | 85           | 14        | ..     | ..      | ..    |  |
| 3, 9, '11  | 6,608,000 | 11,000   | 81           | 16        | 1      | ..      | 2     |  |
| 3, 10, '11 | 6,720,000 | 12,000   | 72           | 26        | ..     | ..      | 2     |  |
| 3, 11, '11 | 6,600,000 | 13,000   | 75           | 20        | 2      | 1       | 2     |  |
| 3, 12, '11 | 5,040,000 | 14,000   | 77           | 20        | 3      | ..      | ..    |  |
| 3, 13, '11 | 5,200,000 | 10,000   | 72           | 20        | 1      | 2       | 5     |  |
| 3, 14, '11 | 5,100,000 | 13,000   | 75           | 19        | 3      | 1       | 2     |  |

Case No. 4 was a buckskin gelding used as a cart horse about the hospital.

The object of this experiment was to determine the effect upon the leucocytes, hemaglobin, time of coagulation and on the power of phagocytosis.

In using the hematocrit in some additional experiments not here recorded (on Case No. 3), it was found that the blood coagulated in the tube before centrifugalization could be accomplished. Following this observation the time of coagulation was taken and found to be 20 seconds. At this time nuclein had been

administered to this dog, hypodermatically, for about ten days. After reflecting over the problem and being aware of the statements made in different publications that an increase of certain salts or proteid substances increase the power of coagulation of the blood, it was reasoned that if the blood could be so altered by the injection of nuclein subcutaneously so that time of coagulation was materially decreased why could not this fact be taken advantage of in cases of hemorrhage following operation or injury in which seepage persisted and inject nuclein directly into blood. It was determined to note the effect of nuclein upon the time of coagulation of the blood in case 4.

*Chart for Case No. 4.*

| 1911. | R. B. C.  | W. B. C. | Poly-morphs. | Lym-phos. | Monos. | Eosins. | Mast. | Hb. | No. Cocci Per Poly-morph. | Time of Coag. Min. |
|-------|-----------|----------|--------------|-----------|--------|---------|-------|-----|---------------------------|--------------------|
| 3, 22 | 7,100,000 | 11,000   | 58           | 24        | 10     | 6       | 2     | 100 | 10                        | 10.5               |
| 3, 23 | 6,580,000 | 9,000    | 59           | 34        | 1      | 6       | ..    | 95  | 10                        | 10.3               |
| 3, 24 | 6,640,000 | 11,000   | 66           | 26        | 6      | 2       | ..    | 100 | 6                         | 20.5               |
| 3, 25 | 7,520,000 | 12,000   | 78           | 14        | 5      | 2       | 1     | 100 | 5.5                       | 39.9               |
| 3, 26 | 7,680,000 | 15,000   | 74           | 21        | ..     | 4       | 1     | 98  | 5                         | 25                 |
| 3, 27 | 6,942,000 | 9,000    | 72           | 11        | 1      | 16      | ..    | 100 | 2.5                       | 23                 |

The count on the first day was made at 1 P. M. The first nuclein was given at 6 P. M. 16 c. c. was given each time hypodermically (subcutaneously).

No nuclein was given after 6 P. M. on the 25th.

On the 23d, 24th and 25th, three injections were made.

In summarizing this experiment we note that the erythrocytes remained stationary. There was a slight rise in the total number leucocytes and in the number of polymorphonuclear leucocytes. The time of coagulation was not reduced till after twenty-four hours. After this time there was a gradual increase in the power of coagulation till on the fifth day after the commencement of administration of nuclein the blood coagulated in two and one-half minutes against a normal time of coagulation of ten minutes. We note that the hemoglobin content was not altered. We note that not only was there an increase

in the total number of leucocytes and of polymorphonuclear leucocytes, but an increase in the power of phagocytosis.

Following the first injection of nuclein on the 25th, it was noted that a swelling appeared in about two hours and was more than six inches in diameter. We were aware that some have made the statement that severe swelling and even suppuration followed subcutaneous injections of nuclein. This was the first swelling we had observed and we determined, if possible, to find the cause. The laboratory assistant, who administered the nuclein, left the graduate standing upon a shelf exposed to contamination and did not wash before pouring out the nuclein for the following injection. Having had some experience with contamination with the bacillus subtilis in my vaccine experiments and being aware of the fact that a proteid substance is a good medium for germs to grow in, I became suspicious that the graduate was my trouble. The syringe and graduate were boiled before the next injection and care as to prevention of a repetition of such accident resulted in no more swellings.

I believe that swellings following the hypodermic injections of nuclein is not due to the nuclein, but to some error in technique.

Noting thus far the effect of nuclein in increasing the power of phagocytosis we determined to run some tests to determine what effect, if any, the nuclein mixed with the serum in vitro would have upon phagocytosis. The following test was run:

*Case No. 5.*

(a) W. B. C.+Plasma+B. E.=21.68 cocci per cell.

(b) W. B. C.+Plasma+B. E.+Nuclein 100 per cent.=14.05 cocci per cell.

(c) W. B. C.+Plasma+B. E.+Nuclein 10 per cent.=20.60 cocci per cell.

(d) W. B. C.+Plasma+B. E.+Nuclein 2 per cent.=19.32 cocci per cell.

a—Was run as a control, b, c and d are the tests.

It will be noted in way of summary of this test that the nuclein added to the phagocytosis test in vitro had no effect on the power of phagocytosis.

Case No. 12 along the same line is of interest at this point and is here given.

*Case No. 12.*

(a) W. B. C.+Plasma+B. E.=15.40 cocci per cell.

(b) W. B. C.+Plasma+B. E.+Nuclein 1:100=15.62 cocci per cell.

(c) W. B. C.+Plasma+B. E.+Nuclein 1:200=14.96 cocci per cell.

a—Was run as a control. B. E. is abbreviation for bacillary emulsion. The bacillary emulsion in all tests were with a twenty-four-hour growth of streptococcus pyogenes upon glycerine agar. Emulsion made in sterilized physiological salt solution. The dilutions of nuclein were made with a sterilized physiological salt solution. The technique of each is carefully checked.

As a summary of case twelve we find an exact repetition of results as in case five.

Case No. 6 was run for the determination of the effect of nuclein on the blood, the nuclein being administered by the mouth. The case was a pup about 5 months old. A goitre was observed on the left side, which was afterwards removed and found to consist principally of a cyst.

*Case No. 6.*

| Date. | R. B. C.  | W. B. C. | Poly-morphs. | Lym-phos. | Monos. | Mast. | Hb. | Time Coag. | No. Cocci Per Cell. |
|-------|-----------|----------|--------------|-----------|--------|-------|-----|------------|---------------------|
|       |           |          |              |           |        |       |     | Min.       |                     |
| 4, 10 | 5,860,000 | 10,000   | 82           | 15        | ..     | 3     | 100 | 1.25       | 13.32               |
| 4, 11 | 7,060,000 | 11,000   | 80           | 15        | 3      | 2     | 100 | 1.25       | 16.5                |
| 4, 12 | 6,520,000 | 5,000    | 81           | 14        | 1      | 4     | 100 | 1          | 18.27               |
| 4, 13 | 6,548,000 | 8,000    | 84           | 13        | 2      | 1     | 100 | 1          | 14.01               |
| 4, 14 | 6,240,000 | 9,000    | 76           | 20        | 3      | 1     | 100 | .75        | 15                  |

Four c. c. nuclein was administered by the mouth beginning at 1 P. M., April 10, 1911. The first test was run before the administration of the nuclein. Nuclein was given three times a

day before meals, so far as could be controlled. No nuclein was given after the 13th.

This is not considered a fair test for the leucocytes as the experiment was not run long enough. We note the time of coagulation decreased after the second day. It may be here noted that this dog had been on an exclusive meat diet for several days before the experiment, which accounts for the short time of coagulation before administering the nuclein. We note an increase in the power of phagocytosis. The hemaglobin and erythrocytes are unaltered.

A similar test was run in Case No. 7 and similar results obtained. This latter test was upon a normal horse.

As stated above we determined to test out the effects of nuclein upon the power of coagulation. The nuclein to be given intravenously. According to this thought Cases Nos. 9, 10 and 11 were run.

#### *Case No. 9.*

The case was a gray gelding. Thin in flesh. Aged. Feed consisted of alfalfa hay. The solution was given intravenously (jugular vein). One ounce in 500 c. c. physiological salt solution.

Time of coagulation before injection—10 minutes.

Time of coagulation 30 minutes after injection—7 minutes.

Time of coagulation one hour and 30 minutes after injection—3 minutes.

Time of coagulation four hours after injection—2.5 minutes.

#### *Case No. 10.*

Bay gelding. Nine years old. Operated on. In operation large branch of circumflex was severed and ligation seemed impossible. Severe hemorrhage persisted after packing and suturing wound. Feed consisted of prairie hay and grain. One ounce nuclein in 500 c. c. physiological salt solution was administered intravenously (jugular vein).

Time of coagulation before injection—12 minutes.

Time of coagulation 30 minutes after injection—7.5 minutes.

Hemorrhage had ceased.

*Case No. 11.*

Roan mare. Aged. Feed consisted of pasture grass. No dry feed.

One ounce of nuclein was given in 500 c. c. physiological salt solution intravenously (in jugular).

Time of coagulation before injection—10 minutes.

Time of coagulation 30 minutes after injection—5 minutes.

Time of coagulation 1 hour and 30 minutes after injection—4 minutes.

As a summary of these tests we see that nuclein when thrown directly into the blood greatly and immediately increases the power of coagulation.

## CONCLUSIONS.

As a summary of the preliminary report of investigations made in this laboratory with nuclein the following conclusions seem justifiable:

1.—Nuclein increases the total number of leucocytes in the blood.

2.—Nuclein increases the polymorphonuclear leucocytes.

3.—Nuclein increases the power of phagocytosis of the individual leucocyte.

4.—Nuclein has no effect upon the erythrocyte or hemaglobin.

5.—Nuclein decreases the time of coagulation of the blood, and promises to be of great value in stopping hemorrhage in cases of wound seepage or injuries.

6.—Nuclein has no effect on the power of phagocytosis *in vitro*.

7.—To obtain the best results in cases of infectious diseases nuclein should be given hypodermatically.

8.—To obtain desirable results in cases of hemorrhage the nuclein should be given intravenously.

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FINAL notice of the United States Live Stock Sanitary Association meeting, giving precise place of meeting, will be found on page 409 of this issue.

## REMARKS ON THE TEACHING OF ANATOMY.\*

BY SEPTIMUS SISSON, S.B., V.S., PROFESSOR OF COMPARATIVE ANATOMY, OHIO  
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The first and most important essential for successful instruction in any subject is a teacher who has a thorough knowledge of the subject matter, good methods of teaching, and enthusiasm. This is a truism which seems to be thought in some quarters not to hold good with respect to anatomical work. As a result of this attitude of mind it is not rare to find this most important of the fundamental professional branches turned over to some convenient individual who admits that he knows something about it "from a practical standpoint," a euphonious statement which often turns out to mean that he has the ability to memorize pretty well the statements to be found in some text book.

The teacher of anatomy should be a trained, professional anatomist, who has had, in addition to the usual courses in the subject, at least one year of graduate work, and some experience in instructional work in a subordinate capacity under expert supervision—preferably in a school other than that in which his undergraduate work was done.

The professor of anatomy should receive a salary sufficient to allow him to devote all of his time to his college work and to justify the college authorities in requiring him to do so. This is absolutely necessary if he is to keep pace with anatomical progress and to do his share in contributing to the advancement of knowledge in this branch. It is a well-established fact that the highest order of teaching is done by men who have done or are doing research, and it is not often true that investigatory activity either alienates men from their duties as teachers or induces in them the tendency to shoot over their students' heads.

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\* This paper was prepared to be read before the Association of Veterinary Faculties and Examining Boards of North America at the Toronto meeting of the American Veterinary Medical Association, August, 1911.

This may appear a little like an attack on a straw man, but one still hears such statements made by those who should know better. There is nothing which so invigorates a man's teaching as active connection with investigation.

In addition to dealing with the large and rapidly increasing literature of his own subject, the anatomist must keep informed as to what is going on in the clinical branches at least, so that his instruction will stimulate and react to advances in medicine and surgery.

The preparation and care of illustrative material dissections, sections, charts, photographs, lantern slides, etc., requires a large amount of time and energy.

It is evident that if the professor in charge of the anatomical branches is to be able to give his college the best service possible, he must be provided with proper assistance, so that he can devote his energies to those things which others cannot do so well or cannot do at all.

It is neither necessary nor desirable that instructors in anatomy should engage in clinical work. This fact is now fully recognized in the administration of good medical schools, and is beginning to be understood also by the more thoughtful and observant of the officials of veterinary schools. When anatomical instructors are freed from extraneous duties and are provided with adequate facilities for their proper work, then—and not till then—can it reasonably be expected that the teaching of this branch will be thorough and effective, and that worthy contributions to the literature of the subject will be made by American workers.

The methods of teaching anatomy have undergone radical changes in the good medical schools during the last decade. The chief change consists in the shifting of emphasis from the lecture room to the laboratory. It seems indeed strange that the lecture in elementary human anatomy, which was a necessity in the middle ages on account of the lack of books on the subject, should have been able to hold its place when good anatomical texts and atlases exist in profusion! It must be admitted, on

the other hand, that the student and teacher of veterinary anatomy have always been and still are much hampered by the paucity of good modern literature. No one now questions the truth of the statement that sound and useful knowledge of anatomy is very largely the product of careful work in the laboratory and that all other methods of information and instruction are subsidiary thereto. It therefore follows that the student must be given the fullest possible opportunity to obtain direct visual knowledge of structure and to train himself in independent observation. The latter appears to the writer to be so essential to the intelligent practice of medicine and surgery that he is strongly inclined to regard it as the more important result of thorough anatomical training. It is quite true that the same benefit may be derived from the pursuit of other branches of natural science, but unfortunately the average veterinary student has not had similar discipline before beginning his professional training. It is evident from the foregoing considerations, that, apart from their importance in regard to content—which is readily admitted on all sides, if indeed it has not been overestimated—the anatomical courses should be highly appraised as valuable training for subsequent work. It is to be feared that this view of the matter is often not appreciated as it deserves to be by college instructors and administrative officers.

A consideration of methods of instruction brings us to controversial ground, and I regard this difference of opinion as a healthy condition, since it tends to prevent us from going on in a state of fatuous complacency, assured that we have attained perfection in this regard.

There is much diversity of view as to the value of didactic instruction and the proportion of time which should be allotted to it. With students who have had fair preliminary training and are provided with suitable texts and works of reference, I believe the lecture on elementary anatomy is practically obsolete and very largely a waste of time. As previously mentioned, the lecture was a necessity in the earlier days of the history of anatomy in the absence of the printed page and the anatomical picture.

It is much to be regretted that we are still very far from having (in English, at least), the literature which is needed in this branch. This lack is felt with special keenness in topographic and applied anatomy, and it is sincerely to be hoped that this gap will be satisfactorily filled before many years pass. In microscopic anatomy also there is no text in English which can reasonably be claimed to be at all well adapted to the needs of students of veterinary medicine.

But it will be urged by some that the lecture is still necessary to give opportunity to the instructor to make a judicious selection from the great mass of anatomical matter of those facts which may be regarded as necessary and to emphasize these, a function requiring critical judgment which the student cannot be expected to have developed. In my opinion this end can be accomplished at least as well and with less expenditure of time in the recitation and in the colloquium and demonstration in the laboratory. Unfortunately in some cases the lecturer has little or no real active connection with the laboratory work, an arrangement which should not be tolerated in any good school. Where this condition exists it cannot reasonably be expected that the necessary correlation between the laboratory and class work can be maintained. Furthermore an instructor who is willing to confine himself to lecturing thereby ceases to be an anatomical worker, and makes it very much to be doubted if he ever were much interested in the subject. The idea seems to linger in some quarters that anatomical facts are practically all cut and dried. Nothing could be further from the truth, and in no branch of biological science is there more activity or more progress, although it must be admitted regretfully that we in America have not begun to do our share in this respect in veterinary anatomy.

It is of course not essential that the professor of anatomy should be present throughout all of the laboratory periods, but he should engage actively in them, supervise thoroughly the work of inexperienced assistants, come into personal contact with the students, and inspire everyone to do his best. Let him

not withhold the word of appreciation of good work nor fail to criticize in a kindly spirit that which is careless or slovenly. In this way he is able to assist greatly the development of good assistants and to estimate intelligently the standing of students.

One of the greatest difficulties encountered by the teacher in this subject is that of inducing students to study their material sufficiently. It is therefore my practice to impress on students at the beginning of the course that—so far as professional requirements are concerned—the first essential is to utilize visual memory, and that the only sort of anatomical knowledge which they can use consists of clear and precise mental pictures of the various structures. Ability so to memorize—objects, not words only—varies greatly in different individuals, and is a faculty which the ordinary school training allows to lie dormant. The anatomical teacher must awaken it and make the student fully aware that without its use he will not secure the training and information necessary to deal with subsequent work in the college and in the field of practice.

Systematic, thorough and accurate work must be insisted on. Structures must be fully isolated and cleaned, otherwise the mental picture will be as vague as the dissection is incomplete and slovenly; and what is still worse, the student acquires careless habits of technique, observation, and thinking which vitiate his subsequent work, and render him unworthy of admission to the profession which he seeks to enter. Students who refuse to do, or seem unable to acquire the ability to do, laboratory work of good quality should be dropped. On the other hand care must be taken that the student does not fall into the error of regarding a good piece of dissection as in itself the end, instead of merely the means, of obtaining reliable and lasting anatomical knowledge.

Experience has demonstrated fully that it is not possible to make thorough dissections and to devote sufficient time to intelligent and fruitful examination of preparations unless the subject is properly preserved. Furthermore the natural shape of many organs is lost in soft material, and precise topography

cannot be established. This is especially evident in dealing with the large herbivora, in which countless micro-organisms emigrate promptly after the death of the subject from the contents of the bowel into all the tissues, and cause rapid and widespread decomposition. Since the introduction by Gerota, his and others some fifteen years ago of adequate methods of preservation and in situ fixation, a large part of the anatomy of man has been rewritten. Adaptation of these methods to the study of the domesticated animals has given most gratifying results, in rendering instruction much more pleasant, thorough and fruitful, in revolutionizing in many cases our conceptions of the true form of organs under different conditions, and in rendering possible precision in topography otherwise impossible.

Time will permit only very brief reference to the use of illustrative material. In the case of the large herbivora it is unfortunately hardly possible, except at very considerable expense, to preserve as permanent specimens sections of the trunk and other large preparations. In consequence this deficiency must be made up as much as possible by the use of charts and lantern slides. It may be said in passing that good charts are of greater utility in some respects than slides: the latter must be used with judgment, and limited chiefly to demonstrating features otherwise difficult to present objectively, *e. g.* details of small objects, unusual specimens which do not often find their way into the dissecting room and cannot be kept, exceptionally good preparations, etc.

Models of gross structure are of quite minor utility. Since really good models are scarce and expensive, while material is easily obtained for natural preparations, it seems the part of wisdom to devote funds which may be available to the purchase of proper containers and cases for natural specimens. It is, however, highly desirable to have models of the eye and ear, and also those showing the chief conduction paths in the brain and spinal cord. In histological and embryological work wax reconstructions and models are exceedingly useful—indeed, in some respects, essential.

I have previously given expression elsewhere to the conviction that the study of anatomy on the living subject is of prime importance as preparation for physical diagnosis and operative interference. It appears that this aspect of the matter has not yet received due consideration—a circumstance which may account in part for the complaint of clinical instructors regarding the insufficiency of the anatomical training of students. The study of surface features in the dissecting room is not sufficient, and besides, many structures which are readily recognizable during life cannot be made out well in hardened subjects. It is evident that efficient instruction in the anatomy of the living body can be given only by the demonstrator dealing with very small groups of students—a circumstance which may render necessary some addition to the corps of instructors. But the results of this method are of such high value as fully to warrant its introduction, or, if already introduced, to justify its extension and improvement if the necessary arrangements can possibly be made.

The chaotic state of veterinary anatomical nomenclature is a very serious matter, chiefly because it imposes a heavy and useless burden on the student. Much of this babel of synonyms is to be laid at the door of non-anatomical teachers and translators of foreign works. It should be distinctly understood, that in the future at least, anatomical names are to be determined by anatomists, and that others must not assume this function. Fortunately the way has been prepared for relief from this situation by the labors of European comparative anatomists, and it seems necessary that we either adopt substantially the terminology which they have evolved, or formulate a uniform nomenclature for ourselves. I see no good reason for attempting to duplicate the onerous task so ably carried out by the European commissions, although some of the names agreed upon may appear undesirable to us; such exceptions should easily be disposed of. As a teacher I must protest most emphatically against the continuance of imposing the senseless multiplicity of terms on our students, who already stagger under the load of an un-

reasonable curriculum. I do not believe that I overestimate the seriousness of the situation, and I am convinced that we ought to give prompt and careful attention to its relief.

In a properly organized department all the branches of anatomy are supervised by the head of the department. The separation of the microscopic from the gross work almost always leads to unfortunate results, as it seldom happens that proper correlation of the two branches is attained, and sometimes no effort is made properly to articulate the two. Even at best the student very commonly gets the false impression that the two fields are quite foreign to each other, whereas the real fact is that the division is quite conventional and arbitrary, and the observer is simply employing in microscopic work certain instruments of precision and methods by which his power of observation is adequately reinforced. The gap often left between macroscopic and microscopic work is specially vicious in that it tends strongly to prevent proper development of the ability to see minutæ which are visible only to the trained naked eye. Every teacher knows the avidity with which students utilize high power lenses, whereas the trained worker will usually inspect a slide first with the naked eye, then with low power lenses, and finally, if necessary, he will use such magnification as will enable him to make out the finer details. Similarly the student should be taught and required to cultivate the ability to see all that is possible with the naked eye; he will doubtless be surprised to find how many structural details he can make out in this way, and will be able to establish the necessary connections between the gross texture of the organs and the finer structure of the tissues. It is evident from the foregoing that the teacher of either of these branches must have a working competence in both. This statement, of course, is not to be interpreted as equivalent to a denial of the necessity or value of specialism, without which no progress can be made.

In the time at our present disposal it has been impossible to offer only a brief introduction of the subject, which may serve to evoke interesting discussion.

## THE SANITARY PRODUCTION AND HANDLING OF COMMERCIAL MILK.\*

BY CASSIUS WAY, D.V.M., HARVARD, ILLINOIS.

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When I was asked by the secretary of this association to prepare a paper on some of the important phases of sanitary milk production, the question came to me as keenly as it must have come to many of you, what right have I with my limited experience to take up the time and presume to discuss such an important subject before so many sanitarians of noted ability, experience and accomplishments. Upon reflection, however, I am mindful of the fact that in sanitary work and especially in milk hygiene, the rapid strides that have been made have to some extent obscured the past and illumined the ideals of the future to such an extent that we all, as sanitarians interested in this work, feel ourselves as a part of this great movement. Therefore, realizing the small part that I play in this work, I consented to endeavor to bring before you some of the phases of commercial milk production that, as an individual interested in sanitary work and public hygiene, are constantly before me.

From the standpoint of importance in domestic economy and the publicity it has received, milk probably ranks second to none among the essential foods of to-day. The importance of a safe, clean, wholesome product to supply the demands and needs of urban life cannot be overestimated. The susceptibility of this delicate article of food to many and varied changes and the many possibilities of its contamination renders a careful method of production and handling of vital importance. In producing and maintaining a safe and sanitary milk supply for cities of the magnitude of New York and Chicago certain definite require-

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\* Presented at the Forty-eighth Annual Convention American Veterinary Medical Association, Toronto, August, 1911.

ments as to production must be maintained, and cleanly methods of handling, refrigerating, transporting and delivering are equally essential. These problems cannot be solved by the layman, they require experience, business sagacity, medical assistance and skill, all working toward a common end.

There is a strong tendency nowadays in business, governmental and medical questions to deal with things of the future in order to avert trouble rather than solve problems under the stress of conditions. The veterinarian who, by his skill in diagnosis and sanitary control, prevents the outbreak of a serious infectious disease, is worth a dozen however skilled they may be, after the disease has become an epidemic. If this reasoning is sane the milk question naturally falls under the surveillance of preventive medicine and the three watchwords are health, cleanliness and temperature.

The maintenance of a healthy herd is the most potent factor in a sanitary milk supply. The herd should be under the surveillance of a skilled veterinarian and any animals suffering from diseased udders, general constitutional disease or disorders of any kind that will in any way harm the milk, should be segregated from the milking herd and treated, killed or disposed of as the case demands. The veterinarian, by virtue of his training and varied experience in sanitation, is the proper individual to watch over the health of the herd.

The attendants should be free from disease of all kinds for, owing to its susceptibility to contamination and being an ideal culture media, milk is often rendered a disease-carrying medium while the venders of such milk are innocent of any contamination with human disease-producing organisms. To this end, a thorough and systematic medical inspection of dairymen, their families and employees should be maintained by all milk distributors in order that they may protect their customers and themselves as much as possible.

Milk should be drawn from the cow at regular intervals into clean pails, preferably of the narrow top design. From a bacteriological standpoint this is the most important stage in the pro-

duction of clean milk. Excessive numbers of bacteria indicate the presence of foreign matter—filth and dirt. Milk that is drawn into an open pail from cows whose udders, flanks and hips are loaded with manure and stable filth, must from the very nature of the process of milking be heavily laden with organisms of an undesirable nature. Therefore, clean cows and narrow top milk pails are prerequisites to clean milk. Many experiments have been conducted to ascertain the value of covered pails in reducing the bacterial count with the uniform result that this form of pail reduces the numbers of bacteria from 40 per cent. to 70 per cent. Progressive dairymen are anxious to reduce the undesirable bacterial content of their milk especially where such an easy and practical solution is at hand and at the present time the reign of the open milk pail seems doomed.

Next in importance to clean milking is proper cooling; this should be done immediately after the milk is drawn from the cow, inside a clean milk house situated within clean surroundings. The time is past when the dairyman can satisfactorily cool milk without the use of ice. However, in certain sections where there are few lakes and where ice is very hard to obtain, cold well or spring water at a temperature of from  $48^{\circ}$  to  $52^{\circ}$  F. is essential. Milk can be cooled in a few minutes to within a few degrees of the temperature of this water, and if the temperature is not allowed to rise above  $55^{\circ}$  F. the milk can be delivered in good condition.

Clean, sanitary milk, therefore, can be obtained if the cows are clean and kept in clean surroundings and persons caring for them and doing the milking are cleanly in their habits and personal appearance. This requires careful daily routine. The stables should be well lighted and ventilated; whitewashed at least twice a year; have tight, sound floors with gutters of non-absorbent material; they should be cleaned and swept daily. During the winter months when the cows are stabled they should be brushed every day, this not only assists in producing clean milk, but is especially profitable by increasing the flow. The udders, flanks and hips may be clipped and the tails trimmed

up and the bush carded out; this will aid materially in keeping the cows clean and when these parts are wiped off with a damp cloth just before milking many fine particles of dirt and large numbers of bacteria are prevented from falling into the pail. The milkers should milk with clean, dry hands, and wear a suit used for milking only. The fact that milk is such a delicate article of food, so susceptible to change and an ideal culture media should control all methods of production.

A bottling plant, milk station or building, in order to handle milk in a sanitary manner should be so constructed as to have different rooms or apartments for different kinds of work. There should be a boiler and pump room, containing boilers, engines and pumps that will furnish an ample supply of pure water, steam at eighty pounds pressure and power for running the various machinery throughout the plant; a receiving room where the milk is received, inspected as to odor, taste, temperature and physical appearance of the fluid, and weighed, and where the farmers' cans are rinsed in cold water, washed and steamed; a storage room; a clarifying and bottling room; and finally ice houses containing an ample supply of safe ice which is used in crushed form around the bottles which are packed in cases and transported to their destination in refrigerator cars.

It has long been recognized that the only safe way to serve milk to a customer is in the original sealed package bottled in the country direct from the dairy under conditions which, from a sanitary standpoint, cannot be duplicated in a large city. Surely there can be no more unfit, dangerous or disgusting methods of serving the public with milk than that of dipping it from cans on the street where it is subject to dirt, flies and other accidental and vicious causes of contamination. The importance of clean containers in vending clean milk is far-reaching. These bottles should be washed, rinsed and sterilized and kept covered in this sterilizer until they are to be used. To the consumer this feature should be vital, for far greater dangers lurk in dirty bottles than in dirty milk.

Now let us consider for a moment the consumers' part in the sanitary handling of milk: Assuming that his bottle of milk is clean and cold, he has certain duties to perform for the protection of the health of his household. A clean, cold place should be provided where it will not be exposed to the heat of the sun or subject to the licking of every stray dog and cat. The cap should be kept on the bottle as long as any of its contents remain unused and when empty it should be washed, first in cold water and then scalded. It is a deplorable fact that too few people treat the milk bottle as a dish in every-day use on their dining table containing a very delicate and sensitive food. To this end some cities have passed ordinances making it a misdemeanor for the consumer to return dirty bottles to a distributor. The education of the consumer along these lines by boards of health through bulletins, the schools and the public press seem to the writer to be of vital importance.

It is proper that every city should adopt practical, prudent methods in an attempt to protect its food supply with due regard for all parties, whether it be for the grower of meats or the producer of dairy products or the manufacturer of any edible food. However, the authorities should not overlook the importance of safeguarding the producers' end from the transmission of unclean containers to the source of supply, for the dairy-men are not always responsible for some of the troubles that are said to be brought to the home in milk. Therefore, co-operation on the part of the consumer on the one end and the producer and distributor on the other, will make complete and strong the daily chain in the sanitary handling of commercial milk.

The foundation of the dairy business lies in the producer, its success in the education of the producer and consumer alike. Give the producer a knowledge of the right methods in producing, handling and caring for milk that he may see the necessity and importance of such care and he will in turn seek information relative to the best means to accomplish this end. Owing to the fact that the production of milk is a confining

occupation and requires careful attention to a large number of details twice every day, Sundays and holidays included, from one year's end to another, we should not expect to revolutionize the entire business immediately; but working carefully, step by step, educating the producer in cleaner methods and then paying for the extra work in producing clean, safe milk. A high price does not necessarily mean clean milk, but clean milk means an increased cost of production.

Unfortunately the general public has for a long time known only one milk and that governed mainly by the price. Indifference on the part of the consumer in regard to quality and sanitary conditions in dairying has done much to retard progress such as is seen in other lines of food production.

One of the weak points in the milk business is the fact that milk is not properly graded. Surely milk produced from healthy cows in a clean, sanitary manner among clean surroundings and bottled in the country, refrigerated and left at the consumer's door after having been watched over and protected in every possible way is better and more costly to produce than where there is no dairy inspection, where indifferent, careless methods of production and handling are used, and where bottling in the city or dipping it loose on the street is the practice. Professor Jordon very aptly says, "Are not quality and cleanliness the prime factors for fixing prices for this class of food?" It should not be expected that milk produced and handled under good sanitary conditions should have to be sold on a par with that produced and handled in a filthy, slovenly manner. The consumer derives the benefit; he in turn should bear his share of the expense.

The price of farm products has increased steadily during the past fifteen years and the very feed that the dairymen uses to turn into milk has been steadily advancing and no one has raised an objection, but as soon as the price of milk is raised in proportion to the increased cost of production, labor and transportation, there is a general cry of robbery, monopoly or combine by the public and the public press.

In this advanced age we are face to face with the revelations of science on the one hand and nature's practical problems on the other. One able physician has said, "The country has gone bacteria crazy, even the children on the street are talking about bacteria." This marks the advancement that is being made in elementary scientific education which will in time assist in eliminating many erroneous and distorted ideas in many of these every-day scientific subjects. The American people are not satisfied to pass step by step from the present condition to the ideal, but they must reach the ideal by a single jump, which from a practical standpoint is not a success. Reaching the desired end through a steady, healthy growth along practical, scientific lines is far more conducive to permanent development than the application of spontaneous theories and fancies.

Does the agitator stop to realize that by glaring headlines in the daily papers, containing oftentimes false and ridiculous statements, that he is only poisoning the mind of the consumer on the one hand and antagonizing the producer on the other? Does he ever stop to think that the dairyman does not have to produce milk simply to meet the needs of the consumer; nor is the distributor compelled to serve the public with milk simply because their daily needs demand it? The bulk of the milk supply must necessarily be commercial milk and an understanding of this phase of the subject is quite as important as the sanitary feature. Agreeing, as we all do, upon the importance of sanitary production, we must not lose sight of the fact that there is a producer and distributor in the reckoning.

Your efforts and mine as sanitarians interested in this great work are toward a common end—a cleaner, safer, better product—even though we may differ slightly in methods and detail. The public, whether it be the producing or consuming class, will follow the teachings and guidance of one in whom they have confidence and it is often encouragement and praise that makes men do their best. Therefore, careful, conservative work along practical scientific lines together with the education and co-operation of all parties concerned is bound to work together for the good of public health and humanity.

## BIOLOGIC THERAPEUTICS.\*

BY GEO. W. DUNPHY, V.S., DETROIT, MICH.

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Somewhere about the middle of the nineteenth century, the minute forms of vegetable life known as bacteria were discovered, and by careful observation, it was determined that various diseases were produced by certain bacteria peculiar to these diseases.

This fact having been demonstrated beyond a doubt, the idea presented itself to certain research workers that these microorganisms, and their metabolic products might be used to combat their own harmful effects on the animal body.

It was believed by eminent scientists that each microorganism produced a certain poison or toxin peculiar to itself, which when elaborated in the animal body, produced a disease showing similar or rather identical symptoms with what could be produced by the artificial introduction of these toxins into the animal.

These facts having been established by the most careful research, another problem presented itself, which at the time must have looked as formidable as a stone wall to the tireless investigator, and that was, how to destroy the bacteria itself or to neutralize the toxin.

By diligent research along different lines, it was finally discovered that a certain element known as antitoxin existed in the blood under certain conditions, which seemed to have the power of neutralizing these toxins. The idea presented itself to certain scientists that these anti-bodies could be used as a protection against infection. It was found that the blood of animals immuned to certain diseases carried these antitoxins in a marked

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

degree, and not only could they be used as a prophylactic, but they were found to have therapeutic properties as well.

This was practically the foundation upon which the biologic therapeutics were established, and a new system of therapeutics begun, that has revolutionized the practice of medicine to a great extent.

While this great evolution in practical therapeutics is scarcely past the experimental stage, enough has been accomplished and sufficient positive results have been obtained, that have never been even approached by any other system of medicine, to stamp it as a science by itself.

Granting that this is an assured science, the question will naturally arise: how are these antitoxins formed in the blood; what is their nature and constituents, and how their therapeutic action is accomplished? I might answer, what these elements are, we know not; what they do, we know well. Take, for instance, the diphtheria antitoxin. We know that when the toxin and antitoxin are mixed together, a very minute portion of the antitoxin will neutralize the toxin. We have demonstrated that when a guinea pig is injected with a lethal dose of toxin, his life can be saved by injecting a small dose of antitoxin within 24 hours, but after 48 hours or longer, it takes many times this dose of antitoxin to neutralize the toxin introduced.

Various theories have been advanced to account for the manner in which antitoxins do their work. Some authorities claim that toxin is a chemical product of the bacteria, having a definite chemical composition, while antitoxin is supposed to be a chemical product of the cells and is practically an antidote to the toxin. Ehrlich claims that one molecule of the toxin combines with a definite and constant quantity of the antitoxin.

As tetanus antitoxin, or antitetanic serum is one of the oldest of the antitoxins that has been used to any extent by veterinarians, we will take up its discussion briefly. While all are ready to admit its value as a prophylactic, we find many that are ready to brand it a failure as a therapeutic agent.

My own experience with its use in the treatment of tetanus has not been as reassuring as I would wish, but it has given as good or even better results than any other line of treatment, and have faith to believe, with the product standardized as it is at the present time and by the use of larger doses, we will eventually get better results.

As evidence of the prophylactic properties of tetanus antitoxin, I quote from a paper written by Dr. Joseph McFarland, of Philadelphia, in 1903, and published in the *Journal of the American Medical Association*, July 4, 1903. Dr. McFarland states that having learned from Dr. Damasa Rivas of certain experiments that he had participated in at the laboratory of professor Calmette at Lille, which showed that antitetanic serum, while not absorbed by the skin or mucous membrane, is readily absorbed by denuded surfaces, and when the dry serum is dusted on wounds it is readily absorbed and confers immunity on animals. Dr. McFarland states: "I at once recognized the practical importance of this observation and conducted a series of experiments to show useful dry antitetanic serum as a dusting powder might be."

I will just give a history of his first experiment, as our time will not admit of a more extensive review of his work along these lines.

Sixteen adult Guinea pigs were employed. The abdomen of each was shaved and with a sharp scalpel the skin was cross-hatched, as in performing the operation of vaccination, and an area of about one cubic meter in diameter was abraded. With a platinum loop a drop of pure culture of the tetanus bacillus was rubbed into the abraded surface. In eight of these animals the seat of operation was dressed with cotton saturated with colloidion. The results were striking. Every one of the first series died with typical tetanic convulsions, while every one of the second series lived and showed no symptoms.

Dr. McFarland made several other experiments along these lines; one showing that a reasonably strong antiseptic did not

protect against the infection when not combined with the antitoxin.

Dr. McFarland goes on to say: "I was loath to publish the results of these experiments until I had learned what Professor Calmette intended to do with the observations he had already made and accordingly corresponded with him, telling him of my experiments and of the important bearing I thought they had upon the prophylactic treatment of possibly infected wounds. He answered that he expected shortly to make a communication on the subject, and a later mail brought me a pamphlet containing his communication made to the Academy of Science at Paris, May 11, 1903, in which his own and Dr. Rivas' experiments are given and in which the results of the experiments performed in his laboratory and my own are shown to be uniform."

Dr. McFarland further states: "The advantages of this method are many. The dry antitetanic serum preserves its activity indefinitely. It requires no instrumental administration but can be conveniently sprinkled from the bottle in which it is dispensed, on the wound after the surface has been thoroughly cleansed and prepared to receive it. It is devoid of irritating properties, slowly dissolves and is absorbed, and when thus applied, has the double advantage of neutralizing the toxin of the tetanus bacillus as it is elaborated in the wound, and of being absorbed into the patient's blood where it remains to neutralize any toxin subsequently formed and absorbed." In his closing remarks the Doctor says: "I feel that these experiments of Professor Calmette and myself should have a most important bearing on dispensary practice, and that particularly in those districts of our country where tetanus is known to be frequent, the powder should be systematically used for dressing wounds. I would recommend a very wide application of the antitetanic serum for the prophylaxis against tetanus in both human and veterinary practice."

I quote these extracts from Dr. McFarland's paper to show that the tetanus antitoxin has the power of destroying the tetanus bacillus or rendering inert. I know by hundreds of experiments

of my own that it has the power of neutralizing the toxin. As the two objects are no longer matters of experimentation but established facts, it is up to the veterinarian, as well as the practitioner of human medicine, to devise means whereby the antitoxin can be brought in contact with the bacillus, and also with the toxin, in sufficient quantities to bring about the desired results. I am optimistic enough to believe that this will be accomplished at no very distant date.

Another important biologic therapeutic in our veterinary practice is the antistreptococcic serum. We are all aware that infection with streptococci is not infrequent in veterinary practice, giving rise to a bacteriemia, which is commonly known as blood poisoning. We find it following ordinary wounds, especially punctured wounds, also after parturition, and especially in cases of purpura and other eruptive diseases. In all those cases, if taken in reasonable time, the use of this antitoxin will usually produce the most gratifying results.

Another important therapeutic agent among the biologic products are the bacterial vaccines, which have come into prominence as a branch of the opsonic theory recently advanced by Sir A. E. Wright.

The white corpuscles of the blood have been looked upon for a long time as the defenders of the system against the invading army of disease-producing organisms. According to Wright's theory (which, I might say, has been corroborated by experiments of other prominent scientists), this success depends to a certain extent upon the presence in the blood serum, of elements known as opsonins (a term derived from the Greek verb, *Opsono*—I cater for), which, according to the function of these elements, seemed to be an appropriate term to express their action in the animal body.

It has been demonstrated by experiments that these opsonins have the power to render the invading bacteria an easy prey to the phagocytes, although the manner in which they act is not understood.

We know by experience that resistance to disease varies in different individuals, and circumstances modify this power of resistance even in the same individual. A low resistance is believed to be due to a deficiency in opsonic power. This deficiency can be regulated by bringing about an increase of the opsonins in the blood to the normal standard. This gives a state of immunity as far as that particular germ is concerned. Unfortunately, we do not understand nature's way of meeting these emergencies in the battle against disease, but it has been found that this end can be accomplished in many cases by the artificial injection, subcutaneously, or killed bacteria in suspension.

A great deal of experimental work has been done to determine the utility of bacterial vaccines, and the reports from different experiments do not always agree. However, the aggregate of the evidence is favorable to the use of these vaccines in cases where careful diagnosis has determined the true nature of the disease and the causative micro-organisms, and in many cases reported the most satisfactory results have been obtained.

Unfortunately, for the success of this branch of biologic therapeutics this method of treatment has some very ardent advocates who have recommended it as a panacea for all infections, not taking into consideration that the vaccines must conform in a measure to the nature of the disease. This has, to a certain degree, strengthened the position of some of the skeptical who have scoffed at this method of treatment since its first inception.

Recently considerable vaccine therapy has been tried by many veterinary practitioners who have relied wholly on clinical symptoms as their guide, both as to the dose administered and the frequency of its administration. The results in the majority of these cases have been highly satisfactory.

In conclusion, let me say that I believe this great branch of medicine is only in its infancy as yet. Definite rules have not yet been formulated in regard to dosage in all cases. We must rely on our own judgment to some extent, always taking note of the changes that follow administration of the vaccines, as

the size and frequency of the dose must correspond with the ability of the patient to develop a specific resisting power.

Several other important serums have been brought into prominence of late years that are of great interest to the veterinary profession, notably influenza antitoxin, hog cholera and dog distemper serums, which have passed the experimental stage, and have taken their place among the veterinary therapeutics.

As this is an age of rapid advancement in medical science, no doubt many new biological products will be discovered within the next few years, and in many instances the veterinary profession will be called upon to test these products.

Let me sound a note of warning at this time to each and all to guard themselves against too hasty conclusions. Let us be careful and conservative about forming and declaring our judgment, not basing it, as is frequently done, on one or two small experiments, not forgetting the old adage that "one swallow does not make a summer," and at the same time let us be slow to condemn in case our first experiment should prove a failure.

In such cases we must take into consideration the condition of the patient, its surroundings, how far the disease has progressed, and, if the ravages of the invading bacteria could be overcome, we still have enough of the vital forces left to carry the animal through the convalescent period.

I have faith to believe that the day will come before this century has passed its middle age, when all infectious diseases will be controlled by biologic agents, either along preventive or therapeutic lines.

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THE Illinois State Veterinary Medical Association will meet at the Lexington Hotel, Chicago, December 7 and 8, immediately succeeding the United States Live Stock Sanitary Association. These two important association meetings, and the Fat Stock Show, December 2 to 9, will make Chicago an interesting centre for veterinarians and stockmen for the best part of the first two weeks.

## PHARMACEUTICAL ITEMS OF INTEREST TO THE VETERINARIAN.\*

BY FERD. A. MUELLER, PH.G., V.S., INDIANA VETERINARY COLLEGE,  
INDIANAPOLIS, IND.

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In addressing such a qualified and enlightened body of veterinarians on the above-named subject it is not an easy matter to produce new and interesting subjects. I offer my apology should I perhaps take up too much of your time. It is an indisputed fact that we are kept informed of the advancing developments of veterinary medicine by able writers.

By viewing our own doings and by criticising ourselves we find that we are governed by surroundings and conditions that create and command peculiar ruts that we adopt and naturally follow. Some of the ruts are:

1. We get too disciplinary in them and allow ourselves to forget the principles of acquired sciences of our profession outside of our ruts. The following are the prominent allied sciences that compose our art, viz.: theory, practice, surgery, anatomy, physiology, histology, pathology, bacteriology, pharmacy, materia medica, chemistry, matrology, botany, etc.

2. We forget to exert our senses to serve our brains. Because of my subject I will consider the last five named allied sciences, *i. e.*, pharmacy, materia medica, chemistry, matrology, botany, etc., inviting at our expense other factors to perform these duties.

3. Because we get into those ruts we fail to lock arms with the small army of workers in the A. V. M. A.

4. There is in each one of us more or less latent energy, that if we would only develop it would make us philanthropists.

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\* Presented at the Forty-eighth Annual Convention American Veterinary Medical Association, Toronto, August, 1911.

5. These ruts make us dormant and negative to the advancement of veterinary science, only to be awakened by the efforts of the veterinary medical associations.

6. We confine ourselves to a limited number of therapeutic agents, when we have at our command a great variety of agents, many of which are specifics that should be used; many more than we can carry in a medicine case, which by confining our practice to a limited assortment, we practice the bad feature of substitution.

7. We will purchase from a supply house manufactured pharmaceuticals, and neglect reading all the conditions and circumstances on the label and not differentiate between a U. S. P. Br. Fluid Extract, an acetic Fl. Extr. or a non-official Fl. Extr.

8. We will purchase important, expensive drugs in broken packages.

The A. V. M. A. stands for the development and protection of the allied medical sciences and not for empiricism and commercialism; empiricism and commercialism in medicine are the peers of the uneducated veterinarian; it is to be regretted that these factors have established quite a foothold among the educated veterinarians.

The empiric is obliged to resort to empiricism and commercialism, synonymously termed quackery. But the educated veterinarian who has that noble asset of a veterinary education will find, by following rational tactics, he will be more successful scientifically, commercially and socially.

The pharmaceutical field presents similar parallel conditions. In many instances it preys upon the unguarded in the same manner that the quack preys upon his patron. Pharmacists will purchase pharmaceuticals because they are cheap and dispense them as first class. Just a few years ago we could purchase laudanum at fifty cents per pint because both practiced commercialism. Can it be repeated to-day? Yes, wherever the hand of the law is not near. Phenacetine, antipyrin, antifibrin, aspirin, urotropin, etc., comparatively expensive medimacents when we purchase them in broken packages we may get acetphenetidinum,

phenazone, acetanilid, acetylo-salicylis, hexamethylene-tetramine, a great difference in money value.

Powdered opium may be adulterated with powdered extract of licorice, the natural salicylic acid by the artificial, essential oils by a mixture of castor oil and alcohol, etc.

In these vast countries where desired medical supplies are not always to be had in the different parts of the country, substitutions must be resorted to. Many of us are confronted with these conditions, but where we have brother veterinarians and qualified pharmacists these conditions should not occur. Just think of it, many pharmacists and veterinarians purchase such pharmaceuticals—and you must bear in mind in some instances they are prepared by very unqualified persons—as lime water, paregoric, laudanum, spiritus minderi, sp. of camphor, tr. iodine, dilute acetic acid, dilute mineral acid, tr. iron, aromatic spirits ammonia, Goulard's extract, lead water, liquor potassæ, liquor iodæ, normal salt solution, Fowler's solution, etc., not knowing the *modus operandi*, and if they did they have forgotten or do not care to bother making them; and by so doing, does not the educated veterinarian place himself on the level with the quack?

I do not wish to force the impression that we ought to make all of our pharmaceuticals. We had better leave the manufacture of certain compounds to those experts that have grounded themselves in the details of the chemistry too far advanced for us to comprehend to manufacture. Again, for some preparations, modern machinery has been so developed that its manufactured products far exceed in accuracy and workmanship compared with the abilities of our hand utensils.

Many preparations have been invented in the past forty years that require expert chemists to manufacture; at the same time there are many simple remedies that can be readily made by the veterinarian or pharmacist. I do not mean to say that we should use or substitute these preparations, but I do suggest that we thoroughly learn pharmacognosy and therapeutic properties found in up-to-date material medicas and then compound our own as we desire them.

When we read announcements of some colleges, a claim is made by them that they give instructions to their patrons how to detect the adulterations and sophistications in drugs and medicines. This is true, but does it not rationally follow that the enlightenment of the art of substitution and sophistication is awakened and also practiced for empiricism and commercialistic results? Perhaps above assertions are too radical, but when we reflect and find that the veterinarian received but a limited amount of pharmaceutical and chemical education and that in a very undisciplinarian manner to the time of appointment of a national commission of examiners by the Board of Agriculture. Upon annual investigations of the conditions in veterinary colleges it followed that baneful, undisciplinarian tactics were removed and certain numbers of hours in instruction in pharmacy, chemistry, laboratory work and botany were demanded. In the other allied sciences a greater progress has been made. If we reflect back forty years, we will find that the microscope was apparently unknown to the veterinarian. Even in human medical schools it was as rare as a curiosity in a circus. Many of our older practitioners would not accept its presentations, for they knew little of the microscope, much less of bacteriology. The germ theory was a contested hypothesis. What a wonderful development is presented to-day. Have not the high percentages of mortalities caused by contagious and infectious diseases been reduced to very low percentages? Are not the members of this association putting their entire energy at the present time to develop these bacteriological theories? We hope to see the day when the labor of the members of this association will have the credit of preventing grief and maintaining happiness in our homes.

We must keep out of our ruts, to exemplify what Emerson said, and receive our rewards, viz.: A man may preach a better sermon or build a better mousetrap than his neighbor, even though he build his house in the woods, the world will find him out and wear a beaten path to his door.

1. Review occasionally your elementary textbooks.

2. Experience is as important as education.
3. Do not forget your experience or your education.
4. It is often essential that we write prescriptions.

There are a few items regarding prescription writing and compounding, for by our enlightened public our intelligence and ability are censored. A prescription may contain six parts:

1. The name of the patient and date.
2. The superscription  $\mathcal{R}$ , meaning "to take of."
3. The Inscription, composed of—base, adjuvant, corrective, diluent.
4. Subscription, stating what is to be done with the Inscription.
5. Signature. The directions for administering the medicaments.
6. The doctor's name.

It is well to observe the little grammar that is necessary. Do not use flourishes. Place a comma after each item in the inscription and a period after each line.

5. Do not ignore volume, weight and specific gravity.
6. Remember the peculiar actions of the different temperatures on drugs.
7. The solvents and the solubility of drugs.
8. Get familiar with the metric system. A few remarks will make it comprehensible, viz.: A meter, the unit of length, is the 10,000,000th part of a quadranth of a meridian of the earth, about 39 in. The unit of volume is the litre, obtained by cubing a decimeter equivalent to about 1 quart and 3 ounces in our measure. The unit of weight is the gramme, obtained by filling the cube of a centimeter with distilled water at a standard thermometric 62° F. and barometric 30 degree.

The units are multiplied and divided in a tenfold ratio. To each unit are applied the same prefixes, viz.: the Latin deci, centi, milli to the divisions, and the Greek deca, hecto, kilo to the multiples. To associate this system with ours a few equivalents must

be remembered. The grain value is obtained by dividing the gramme by 15.43<sup>+</sup> which is the weight of the gramme in grains, which equals 0.06<sup>+</sup>; divisions and multiples are readily computed therefrom; 4.0 represents the drachm and 32.0 the ounce; likewise divisions and multiples will be computed therefrom.

9. Remember the actions, doses and antidotes of the narcotic drugs.

10. Remember that in the kitchen we have many agents that can be used medicinally in cases of emergency, viz.: Mustard, vinegar, butter, bicarbonate soda, salt, spices, flour, molasses, eggs. Toxicology suggests them.

11. Observe chemical, pharmaceutical and physiological incompatibles.

12. Consider the solubilities of the constituents of drugs as they are classed pharmaceutically, according to the respective solvents for them: spirits, liquors, aquæ, etc.

13. Consider the constituents of drugs as they are classed of alkaloids, glycosides, resins, oleo resins, gum resins, gums, volatile and fixed oils. .

14. Tinctures and infusions are not so good made from fluid extracts as when made according to the United States Pharmacopœia. Because it is not possible that a fluid extract in some cases can have all the active constituents of its drug in a limited solvent. A tincture or infusion with a ten times greater solvent would be comparatively stronger made according to the Pharmacopœia than when made from a fluid extract.

17. Medicines producing precipitates should always be shaken as the precipitate may be the active principle.

18. All acetates are soluble, but it does not follow that acetic fluid extracts contain more soluble constituents than the U. S. P. fluid extracts. Because the active constituents, mostly alkaloids, exist in plants in combination with vegetable acids whose chemical affinity may be or is stronger than that of acetic acid, and therefore will not yield to the solvent action of acetic acid as well as to the solvent action of an alcoholic **menstrum**. Clinicians have had therapeutic experiences and can verify above.

19. Keep in mind the chemistry of the different secretions of the alimentary canal, which will greatly assist in applying proper therapeutic agents.

20. Keep in mind the therapeutic actions of drugs, also transient and cumulative ones.

21. Also the great value of the U. S. Pharmacopœia and the dispensaries.

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THE annual meeting of the Ohio State Veterinary Medical Association will be held in Columbus, January 16-17. The veterinarians of the Buckeye state have made a record for progressiveness and they intend to keep it up. All who can possibly do so, should attend it, and there is no restriction on state lines.

B. A. I. MEN AND THE AMERICAN VETERINARY REVIEW.—

One of our subscribers in the B. A. I. service who is a very enthusiastic reader of the REVIEW, and who has had to do work in outlying districts away from the office of the inspector in charge, and has thus been inconvenienced and put to the trouble of having his REVIEW held by the publishers, has learned that periodicals will be forwarded to them without extra postage if their absence is in the government service, if addressed to them care of their chief inspector's office; and he desires us to publish the fact for the benefit of his brothers in the B. A. I. Service.

THE Toledo Clinical Laboratories have been closed since November 10, and will remain closed until the 18th of the present month, due to Dr. Longfellow's yearly pilgrimage to various large cities, gleaning knowledge from the most advanced laboratories. This year, our good friend's pilgrimage requires a longer period of time than usually, because, being a member of the laboratory section of the American Public Health Association, he goes to Havana, Cuba, to attend the meeting of that body, December 4 to 9; but the patrons of the Toledo Clinical Laboratories will be more than repaid for any inconvenience they may have been put to by Dr. Longfellow's absence, in the added scientific knowledge that he will bring back and give them the benefit of.

## TRAUMATIC PERICARDITIS.\*

BY G. H. ROBERTS, INDIANAPOLIS, IND.

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The condition which we are discussing, while not at all uncommon in the bovine, for some reason has been slighted by a majority of authorities; therefore we find very little in current literature on this subject; so what we do know has been acquired by each of us in our own experience. The symptoms of this disease are so baffling and complex that it is hardly possible to make any absolute classification of the various forms which are encountered, but for our own satisfaction we have made a classification which we believe will somewhat simplify the subject. According to symptoms and length, of course, there may be said to be an acute or at least a subacute and chronic form. According to the pathology we find a serous, sero-fibrinous, hæmorrhagic and purulent pericarditis. In all forms, however, we find considerable thickening of the parietal and more or less complete obliteration of the visceral part of the pericardial sac. Invariably are also found adhesions along the course of injury; that is, between stomach, diaphragm, lungs and pericardium. This undoubtedly is due to the acute inflammatory reaction. The purulent form is more commonly met with as an acute disease. Whether the pus formation is directly due primarily to the septic condition of the foreign body, or to secondary infection following the trauma, is a question we have not been able to satisfactorily settle in our own minds. In this form, pus forms in the pericardial cavity, either filling up the entire pericardial sac, or forming in pockets due to fibrinous adhesions. In any of the forms in which exudate is present the pericardial sac may be enormously distended, so much so that upon post mortem, not

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

only quarts but gallons of fluid or semi fluid material will be found. In other cases, when there is not so much fluid present, the distension of the sac will be due to the formation of putri-factive gases, caused by the degenerative changes which have taken place. Sooner or later in the course of the disease, the heart muscle itself naturally becomes involved. This may take the form of serous or purulent infiltration of the heart muscle, or the formation of single or multiple circumscribed abscesses. Naturally associated with this we will find a greater or less degree of fatty degeneration showing the pathological picture usually seen in this condition. Strange as it may seem, the heart sounds remain practically unchanged until the disease is well advanced; about the only appreciable change is the muffling of the sounds accompanied by an increased vascular tension; not until the accumulation of the fluid in the sac has become abundant enough to cause direct pressure upon the heart or other pathological changes have occurred in the heart itself, do we get sufficient cardiac derangement to cause symptoms enough to give us an inkling of the true state of affairs. By this time we get cedema and circulatory disturbances due to the awful strain under which the heart is laboring. It is hardly to be expected that in a condition so grave as this that the lungs, so closely associated to the heart anatomically and physiologically, should escape involvement, nor do they. So we are indeed fortunate if we find nothing more than a localized pneumonitis. More frequently, however, we find a purulent infiltration, and, in fact, any of the conditions which may occur in the lungs due to infection or impeded circulation. As a result of the complex pathological changes which we can readily account for, the objective symptoms soon manifest themselves, such as dropsy, faulty and painful breathing, exaggerated pulsation of the jugular veins, etc.

Pathological changes of the stomach and intestines are those usually seen in gastro-intestinal catarrh, depending on the length of time the disease has been progressing. In practically all cases, if the parts are examined with sufficient care on post mortem,

the perforation between stomach and diaphragm and the entire traumatic tract leading to the pericardium may be readily traced, although at times to do this is practically impossible, owing to the character of the infection present. If the germ causing the infection is of streptococcus variety, we not alone find that the disease runs a shorter course, unless the animal's resistance is very high, but we find, owing to the activity of this germ, a very rapid liquefaction of all the tissues involved, and upon post mortem is seen a matted, pulpified, fibro-purulent mass in which anatomical differentiation is not readily made. If the animal is able to live through the acute inflammatory stage, the post-mortem picture presented is somewhat different, for then we find that organization of the inflammatory exudate or absorption has taken place, and there is seen masses of cicatricial tissue, appearing as roughened, indurated masses.

As before stated, the symptomatology is very indefinite and the early symptoms are all gastro-intestinal. When first seen, the case appears to be one of slight impaction of the stomach or of gastro-intestinal catarrh with a temperature from  $102\frac{1}{2}^{\circ}$  to  $103\frac{1}{2}^{\circ}$ . A slight diarrhoea or constipation is present. The symptoms seem to be that of gastro-intestinal derangement. The general appearance of the animal would not lead one to suspect any grave disease. In fact, the only suspicious feature is the character of the pulse, which is accelerated entirely out of proportion to the other symptoms. Soon the futility of the medication given and the appearance of some slight cardiac or pulmonary symptom leads one to suspect the derangement is not entirely gastro-intestinal. By careful watching and examination the true diagnosis becomes established, in most cases by exclusion. From now on the case runs a rapid course. The countenance assumes a worried expression. The animal appears languid. The appetite is irregular, gradually becomes entirely lost. The eyes become sunken and lustreless. A cough is present in most cases, especially upon slight exertion. The visible mucous membrane shows variable change in color. Diarrhoea that was slight becomes more pronounced. The animal shows

steadily increasing emaciation and soon succumbs to pulmonary, or more frequently, cardiac insufficiency. In other cases the disease does not run such an acute course; the animal apparently recovers without a correct diagnosis having been made, and the true condition is only discovered from post mortem some time later, as in a case I will report.

Dr. O. G. Whitestone, of Huntington, Ind., reports a case where a crooked fence wire 11 inches long was removed through the ribs on the left side, animal making apparently good recovery, but at the time of her illness showed many of the symptoms characteristic of traumatic pericarditis.

With but few exceptions the prognosis is bad, though in some cases recovery seems to take place spontaneously. There is no specific treatment. The entire course of the disease being complex and indefinite, the best we can do in the present state of our knowledge is to treat the case symptomatically.

In conclusion I ask your indulgence while I report the following cases which it has been my fortune to see, and also a case of Dr. F. A. Nelson, of Lebanon, Ind. While some of the few authorities I have been able to find mention great rise in temperature, I have not seen this in my own cases. Rather have I noticed the temperature becoming lower as the disease advances. However, I do not doubt some of the gentlemen present have met with such cases. I believe the degree of temperature depends upon the violence of the infection and the inflammatory reaction resulting.

Dr. Nelson writes me: "On February 22, was called to see a short-horn cow, five years of age, weighing about 1,300 pounds. Owner stated cow was not eating much and that she had on the day previous a profuse diarrhoea. Found animal with temperature of 102.5. Pulse about 65 but regular; catarrhal condition of the bowels present; conjunctiva slightly icteric and catarrhal. Prescribed a tonic, gave one quart of raw linseed oil. Diarrhoea supervened and owner came in and I gave him some triple sulpho-carbolates to give along with the tonic. Was called again on February 28; found animal weaker.

Temperature  $100.5^{\circ}$ , pulse about 70, slight œdematous swelling in intermaxillary space. Upon auscultation could detect an increased or intensified heart beat. This and the swelling between the intermaxillary space caused me to pronounce it a case of pericarditis, and I changed treatment to digitalis. Upon exercise this animal would cough slightly, which led the owner to suspect tuberculosis, and for his satisfaction the cow was tested with tuberculin, but no reaction. I did not see the cow again alive, but owner called me March 29 and stated cow was dead and that he wished an autopsy held. I found a tenpenny nail had penetrated reticulum, diaphragm and pericardium, but the nail was scarcely a quarter of an inch inside of pericardium. Of course, adhesions between diaphragm, stomach and pericardium were present, as well as quite a large amount of fluid in the pericardial sac. I will also state that previous to the animal's death the œdema of the chest had increased to such an extent that one-third of the external surface of the abdomen was involved."

Of my own cases I wish to report the following:

Case 1.—In October of 1910, I was called to see a very valuable cow, with a two-weeks-old calf by her side. This animal showed a temperature of  $104^{\circ}$ . Diagnosis, pneumonia. This animal also showed all the symptoms of an acute gastro-intestinal catarrh. On my second visit, two days later, I made a more careful examination and discovered that I had cardiac trouble present to a marked degree. There was thoracic pain manifested by grunting, and at the end of ten days marked œdematous swellings had appeared at the brisket extending backwards and becoming wider, until the udder was reached and nearly obliterated. On the fourteenth day this cow died. Post mortem held the following day showed a purulent pericarditis with great hypertrophy. This case and the one reported by Dr. Nelson are of the more acute form.

Case 2.—February 10, 1911, was called to see a four-year-old cow which showed symptoms of gastro-intestinal catarrh, with a temperature of  $103\frac{1}{2}^{\circ}$ . The owner told me this cow

had not been doing well since calving three months previous, although she was not greatly emaciated at that time. I prescribed oil and tonics. Two days later I was somewhat disappointed in not finding the patient much better, but instead found her suffering more pain manifested by grunting, regurgitation of blood at the jugular, etc. The temperature was lower than it was two days previous but pulse more rapid. She did not care to move and remained standing most of the time. At the expiration of ten days she became very weak and would now lie down most of the time. On the fourteenth day after my first visit the animal died without showing at any time a dropsical condition of any kind. Post mortem revealed what we had feared upon our second visit. Traumatic pericarditis due to a wire  $2\frac{1}{2}$  inches long which had found its way directly through the diaphragm and pericardium into the heart muscle, where we found a pocket filled with pus. Very little fluid of any kind was found in the pericardial sac.

Case 3.—March 17 was called to see a cow that owner said was suffering from paint poisoning, as the signboards upon his farm had been newly painted three days before. I found this animal in a dying condition, and a post mortem was made the following day. After examining carefully the stomach and intestines for the effects of toxic agents, I discovered a small opening at the lower portion of the diaphragm. The lungs and heart were removed and a typical traumatic inflammatory tract could be traced directly to the heart. These two latter cases I have termed a chronic form. In Case 3 the owner had another cow die a week later with the same symptoms and post mortem except the heart lesion, which satisfied me that my diagnosis of paint poisoning was correct, and that Case 3 did not die of the traumatic pericarditis, and I feel safe in saying that this was a case of chronic traumatic pericarditis in which the animal might have continued to live for several months producing her seven or eight pounds of butter per week as she showed no external manifestation of disease up to within two days before her death.

## SELECTIVE VASO-CONSTRICTORS AND VASO-DILATORS.

BY H. JENSEN, KANSAS CITY VETERINARY COLLEGE.

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The action of certain drugs upon the vaso-motor nerves is in a general way considered in the study of pharmacology in the various colleges of medicine, but inasmuch as the various medicinal agents classified under vaso-constrictors and vaso-dilators only exert their action upon certain groups of vessels and not upon others, the selection of these agents becomes of special therapeutic significance and should be more generally understood. It is not intended to enter into detail of the action of agents herein described, but rather point out common erroneous ideas as well as specific indications for use. The nerves governing the arterioles belong to an extensive system known as the sympathetic nervous system which is composed of ganglia and very fine medullated and non-medullated nerve fibres. The mechanism regulating vascular tension is found in the walls of the blood vessels, in the smooth muscular fibres, in the terminals of the vaso-dilators and vaso-constrictors which are governed by the vaso-motor centres in the medulla and the sympathetic ganglia.

### SOLUTION OF ADRENALIN CHLORIDE.

The solution of adrenalin chloride has, since its discovery, been accepted as one of the very best vaso-constrictors and enjoys a very extensive use locally as a hemostatic, and, as is well known, a solution of 1-1000 injected subcutaneously will enable the surgeon to perform an absolutely bloodless superficial operation. This action is obtained by adrenalin inducing contraction of the muscular coat of the blood vessels. When administered intravenously the constitutional effect being desired, the action

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is what may be termed selective, as only the blood vessels of the abdominal organs are constricted, while the vessels of the lungs, heart and brain are not appreciatively affected (the constitutional action of adrenalin is obtained by injecting it into the veins). When the terminations of the sympathetic nerves arising from the lumbar and dorsal regions are stimulated, a marked rise in blood pressure is observed. This is principally due to the constriction of the blood vessels of the abdominal cavity. Thus it will be seen that adrenalin exerts its influence only over the organs receiving nerve fibres from the dorsal and lumbar cord.

*Special Indications for Use of Adrenalin.*—In chloroform or other narcosis, surgical shock, etc.

It will be remembered that in chloroform poisoning almost all of the blood of the body is drained into the vessels of the abdomen. The vaso-motor centre is paralyzed and death ensues from vascular relaxation. The intravenous injection of adrenalin acts directly upon the muscular fibres in the vessel walls and so to speak by constricting same, forces the blood out of the abdominal vessels into the general circulation and thus causes a rise in blood pressure. Many an animal apparently dead, pulseless with only an occasional gasp for breath, has been restored by this treatment.

In cardiac failure, hemorrhage of bowels, bladder, uterus, by local application or through its central action.

*Contra-indications.*—In hemorrhage of the lungs this agent is worse than useless. As has already been stated, adrenalin has its selective influence over the organs receiving sympathetic fibres from the lumbar and dorsal region, therefore the vessels of the lungs are not constricted and with the increased blood pressure, tends to increase rather than diminish the flow of blood. Experimentally I have caused hemorrhage from the lungs on dissecting subjects and even the direct application of adrenalin solution has no effect. This is also true of the brain.

*Administration.*—Owing to the fact that this agent causes a complete ischemia of the parts contacted, its administration by

the mouth and subcutaneously when the constitutional effect is desired is of no use, owing to tardy or practically no absorption. Intravenous injections of 4-8 c. c. of the 1-1000 solution diluted in normal saline solution for a horse is the most efficacious method. It should be remembered that the action of this agent is quite transient.

#### BELLADONNA.

The action of belladonna on the blood vessels and heart furnishes a very interesting study. The heart is quickened from paralysis of the cardiac inhibitory fibres. Sometimes the heart is slowed and at first weakened owing to the stimulation of the inhibitory centres in the medulla. Blood pressure is considerably increased by the augmented output of the vaso-constrictor centre in the medulla which constricts the vessels of the abdominal viscera. The constriction of the vessels of the abdomen is accompanied by dilatation of the vessels of the skin. This dilatation of the skin, however, is insufficient to overcome the constriction of the vessels of the abdominal viscera so that a considerable increase in the arterial tension follows. The action of belladonna in small doses, constricting as it does the vessels of the abdominal viscera, may be taken advantage of in the treatment of hemorrhage of the bowels, bladder and uterus, with uniformly good results. Belladonna has been used internally in threatened peritonitis following ridgling castration or from traumatism with excellent results. Although the theory of lessening the blood supply to a part to prevent inflammation may not be in strict accord with the ideas of the modern pathologist, yet from extensive clinical observations I have found it of great value. I have in mind a colt on which an unsuccessful attempt had been made to remove a hidden testicle. A severe laceration of the peritoneum took place with a great mass of intestines protruding from the aperture. The colt was brought ten miles to the hospital in a wagon. The operation was completed and the bowels replaced. After packing the inguinal canal the animal was given five drops of the fluid extract of belladonna hourly

for twenty-four hours, and absolutely no sign of pain or any inconvenience took place.

Penetrating wounds of the abdomen have been treated in a similar manner with excellent results.

The dilatation of the superficial vessels as well known to every practitioner, is taken advantage of in the treatment of bronchitis, pneumonia, etc., in the early stages, the object being to equalize circulation and to diminish the amount of blood in a coagulated area. Under such conditions a large dose should be given. The point to be remembered that excessive doses is liable to cause a general dilatation of the vessels. Small doses of atropine given prior to the administration of chloroform to produce anæsthesia, lessens the danger of chloroform poisoning very markedly, by contracting the abdominal vessels and thus overcoming vascular dilatation induced by chloroform.

#### ERGOT.

Ergot is perhaps one of the most generally used vaso-constrictors at our command, yet according to recent experiments its use in pulmonary hemorrhage is of doubtful value because the vaso-constrictors are not very strongly developed in the pulmonary vessels, and the increased blood pressure produced by ergot might increase rather than diminish the hemorrhage. In other internal hemorrhages where surgical interference is not possible, ergot is the best agent at our command. Thus ergot is useful in the early stages of cerebral, spinal or pulmonary congestion, hemorrhage from the uterus, bowels, nose, etc.

#### STRYCHNINE.

Strychnine has, owing to its vaso-constrictor and tonic action given excellent results in the treatment of purpura hemorrhagica. A series of experiments were carried on at the Kansas City Veterinary College two years ago and several animals received as much as  $1\frac{1}{2}$  grains of strychnine sulphate every hour or in other words, 36 grains in 24 hours, consecutively. It pro-

duces typical toxic symptoms, that of nervousness, restlessness and the least touch would produce a spasm. It occurred to Dr. Brown, of this institution, that this agent, through its vaso-constrictor and tonic effect, would be of value in the treatment of purpura and the results have been highly satisfactory and has, up to this time, diminished the death rate about 50 per cent. It has been found that after the administration of this agent, the serous transudate is diminished and the swelling subsides quite rapidly. A second attack may occur after a period of seemingly very rapid improvement, but the continued use of strychnine has proven quite satisfactory. We now prescribe as much as one grain of strychnine sulphate every hour for three or four consecutive days and so far, none of the animals thus treated have succumbed to strychnia poisoning.

#### NITROGLYCERINE.

Spiritus glycerylus nitratis, glonoin, or trinitrin is an alcoholic solution of one per cent. of nitroglycerine. There is a popular idea among practitioners that nitroglycerine is a powerful heart stimulant, but it should not be so considered. Nitroglycerine is a powerful vaso-dilator, the arteries and the veins both widening very considerably under its influence, especially the vessels of the abdominal organs and the head. Owing to the lessened resistance, the heart beats more rapidly and a decided fall in blood pressure takes place.

*Indications for Use.*—Dypnoea, due to pulmonary congestion, pulmonary oedema, pharyngitis, bronchitis, etc.

Nitroglycerine is a most valuable agent in these conditions: widening as it does all the vessels of the body and so to speak drains the blood away from the congested area, and equalizing the circulation. Also when the heart is laboring hard under great vascular tension.

*Contra-indications.*—I have to my great dismay seen nitroglycerine given in chloroform narcosis and of course without any beneficial results when it is known that in chloroform poisoning almost all of the blood is found in the vessels of the abdomi-

nal viscera and as nitroglycerine especially dilates the vessels of the abdominal viscera, its uselessness is obvious.

#### ALCOHOL.

Alcohol, being a powerful dilator of superficial vessels, is of great value in congestive chills and fevers as it markedly increases heat radiation and also yielding itself so readily to oxidation it also helps to sustain the strength of the animal off its feed. It should be borne in mind that the result of all other stimulation leads to general depression, so alcohol should always be given in moderate doses. A great many other agents owe their medicinal virtues in part to their action on the blood vessels and I trust this short paper may stimulate the practitioner to look into this very important phase of pharmacology more closely and cultivate a more intimate acquaintance with the real virtue of the many so-called worthless drugs.

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GEORGE WEST BAINBRIDGE, the secretary of the Streets Protective Alliance of Dubuque, began a recent address with the words:

“In the past, when two rich Englishmen met, they would say: ‘It’s a fine day. Let’s go kill something.’

“Now, when two rich men meet, they say: ‘It’s a fine day. Let’s go motoring.’

“It amounts to the same thing, doesn’t it?”—(*Pittsburgh Gazette-Times.*)

THE horse will always be more popular than the automobile. That is easily explained for more than one reason. First the men who can get nicely matched teams and drive them right are not very numerous, and second, there is a distinction in every team, when on exhibition. Any man with money can buy and own an automobile and employ a driver to operate it, and, when placed in the show ring, it has so many duplicates that the interest is lost, when another comes along. The horse will always be popular because of no other animal or vehicle being able to take his place and claim individuality of marked prominence.—(*Horn and Hoof.*)

# HOW THEY STUDY VETERINARY ANATOMY AND THE PRACTICE OF VETERINARY MEDICINE BY CORRESPONDENCE.

BY D. ARTHUR HUGHES, LIT.M., PH.D., D.V.M., CHICAGO VETERINARY  
COLLEGE.

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The correspondence schools are still with us. The gullible are applying for "the course of instruction" and are panting for the vapid books gotten out by these "schools." Occasionally the advertisements of those who conduct the "instruction," such as it is, fall into our hands, and cause us no end of amusement. The other day a "short description of the course of instruction," as it is carried on by one of these correspondence "schools," by chance fell into our hands, and we were regaled with the tidings how to study veterinary anatomy; how to know all about every disease of every animal, and how to treat them with the ease that the wizard, with one touch of his wand, turns mice into horses, or may banish horse diseases with his miraculous power. A book that could teach such things would be a book to conjure with. A man would have to kiss the Blarney Stone a thousand times in order to convince any but the gullible of the falsity of its every statement.

But here is the advertisement of the "course of instruction." Read it and relish it:

"The following is a short description of the course of instructions:

"Part I of the Course of Instructions deals fully on every part in connection with the anatomy of structure of the horse. Not a big word is used, but what can be understood by any person able to read a newspaper. Latin terms are simplified into the most common English. This part alone is very valuable to any person, especially those interested in stock, as it enables them

to understand thoroughly any disease which may affect any of the animals.

“Part 2 of the Course of Instructions deals on every disease and trouble that is known to turn up in the horse. These are arranged in systematic order from beginning to end, that is, all the diseases and troubles affecting a certain set of organs are treated in one chapter. The next chapter treats on all the diseases and troubles affecting another set of organs, and so on. The causes, symptoms and treatment of every disease and trouble is given in such a simple form that any child able to read can tell the disease and treat it even in the most acute cases. In the causes, it states plainly the different causes that are likely to bring the disease or trouble on. In the symptoms, it shows every symptom that the animal will show while suffering under whatever disease or trouble it may be suffering from. You are probably aware there are a number of diseases which have some symptoms the same in different diseases, and to an inexperienced person it might be hard to tell one disease from another, but in the symptoms given in every disease and trouble throughout the Course of Instruction, which every member of the Association receives, it shows plainly how to tell one disease from another, as there are some symptoms which are not noticed in one disease which are noticed in the other. In this way it is a very simple matter to be sure of what disease your animal is suffering from. In the treatment the most simple and best remedies are given. The medicines are measured out in spoonfuls and drops, which is a much more simple method than measuring medicines in scruples, grains, drams, etc. Every person can measure a spoonful of medicine; very few can measure a scruple or grain.

“It tells how to treat a case from the time the horse is taken sick until it is better. Not only what medicines to give him and how often they should be given, but how to nurse.”

In part 1 “Not a big word is used but what can be understood by any person able to read a newspaper.” Oh! joy! No more use for Gould’s medical dictionaries. The whole of Chauvean or Strangeways is evaporated to dryness, as the chemists

say. It has had the technical juice squeezed out of it so that nothing remains but what "can be understood by any person able to read a newspaper." The jaw-breaking, brain-racking, technical terms of the anatomists have been banished into the fine ether of other worlds than ours. Any simpleton who can "read a newspaper" can understand this new work as it lays bare, we presume for the first time, the few simple threads on which anatomical science hangs. This reminds us of the stock in trade of the stupid Scotch blacksmith who became a physician in the Highlands. One of his former acquaintances met him by chance one day and asked him what his line of treatment was for a certain disease. He said, "calomy" (calomel). "Well, Sandy, what is your treatment for so-and-so?" (mentioning another ailment). "Oh, laudny" (laudanum). The old man had certainly learned the rudiments. When one wouldn't do he tried the other; and when the other wouldn't do he tried the first one, and so in the whole round of ills that flesh is heir to. How the anatomists would make merry over this book from the realms of fakerdom, which so teaches their science as to make it as easily understood as reading the morning newspaper. According to the advertisement the study of anatomy is not a matter of dissection and study throughout laborious nights and days. There are no "big words" to be remembered. Anatomy is to be reduced to its rudiments and applied like the lessons in spelling given by Mr. Squeers in Dickens' "Nicholas Nickleby." The boys were taught by Mr. Squeers to understand the meaning of window by saying win-der, winder; w-i-n win, d-e-r der, winder. Then they had to go out and wash the windows to be sure that they understood the meaning. The study of anatomy is just as simple according to the new plan. Anatomy is done up in the smallest package and when you have learned the words you apply them. It is as easy as falling off a log; as easy as reading the newspaper.

The advertisement continues: "Part 2 of the Course of Instructions deals on every disease and trouble that is known to turn up in the horse." This will startle the

professors of theory and practice of veterinary medicine as well as the professors of veterinary pathology. If the statement made in the advertisement be true, they can all learn much from the book and had better procure copies before the edition is exhausted. Notice the barnyard English, too, in which the advertisement is couched. Mr. Macawber in Dickens' "David Copperfield" was a gentleman who sat around, when without a job, "waiting for something to turn up." Every disease and trouble, "according to this advertisement, is something that "turns up," and is, in this epitome of veterinary science, "dealt on." The sentence we are criticising, it is patent, is a piece of tommyrot. With all our knowledge of the diseases of the horse, we do not know all that may appear in that animal. Equally true it is that all we do know cannot be expressed in as many octavo volumes, as this book, whatever it is, has pages. The advertisement is so written that the man to be gulled is led to believe that the book desired to be sold treats of all diseases of the horse in the fewest and simplest words possible. "The causes, symptoms and treatment of every disease and trouble are given in such a simple form that any child able to read can tell the disease and treat it even in the most acute cases." How fortunate it is that such books are appearing from the press. Our little children can understand them; and we can learn veterinary science, to use the language of the Psalmist, "out of the mouths of babes and sucklings."

The advertisement continues by saying that the book "shows plainly how to tell one disease from another, as there are some symptoms which are noticed in one disease which are not noticed in the other." We presume, then, it will be a great boon to students of diagnostics. Lean on the book and you will never be mistaken in your diagnosis. The statement here made in the advertisement is even more amusing than the mistakes made by dogmatic diagnosticians; for the diagnostician knows he makes mistakes, whereas the advertisement claims that no mistakes can possibly be made by the simpletons who study the book.

The book also is a boon to the professor of materia medica and his hard-pressed students. "The medicines are measured out in spoonfuls and drops." The advertisement does not say the drugs are poured into the animals' mouths with a spoon; nor does the animal get a rap on the head with the spoon as did Oliver Twist in Dickens' story when he asked for more porridge. But the only inference is that the book does not teach the use of powders or balls, as everything seems to be of the wet variety. What a comfort it is to think that the measurements are so simple and that a rusty spoon is the only means needed to dole out drugs.

Let the whole profession take cognizance of this advertisement. It is an illustration of the lengths some men go to make money. It is an illustration of a form of philistinism which is an affront to the profession. We should stop such fakes even if a trip-hammer is needed to do it.

"EVERYBODY MILKS IN IOWA."—At the Waterloo (Iowa) Dairy Show the following refrain was sung by the quartette with great eclat, and now all the boys and girls in that state are humming it:

EVERYBODY MILKS IN IOWA.

(Tune: *Everybody Works But Father.*)

Everybody milks in Iowa,  
We all like the cow.  
Pinning our faith to bossy  
Has made our neighbors bow.  
Everybody milks in Iowa,  
Even Sister Rae;  
Everybody does the milking  
In I O A.

Everybody milks in Iowa,  
Summer and winter time,  
Makes no difference to Iowa,  
They milk, rain or shine.  
Soil is growing richer,  
Debts are cleared away,  
Just because they're milking  
In I O A.

Everybody milks in Iowa,  
Let me tell you that,  
Buying auto-mobiles  
With the butter-fat;  
If the grain crops fail them  
They don't move away,  
Just keep right on milking  
In I O A.

Everybody milks in Iowa,  
Hear me, what I say,  
Live on milk and honey  
While the cows eat hay,  
Mother's quit her washing,  
So has Sister Ann,  
Everybody's gone to milking,  
Even my old man.

—(E. T. Sadler, in *Hoard's Dairyman.*)

## CYSTICERCUS RANGIFERI IN ALASKA.

BY S. A. GRUENER, M.V.S., KAMCHATKA, RUSSIA.

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In 1892, the United States government at different points in Alaska began the policy of establishing reindeer stations with the purpose of introducing the reindeer industry to the native population. All the original herds of reindeer (*Rangifer tarandus*), were imported from Siberia. At that time, 1,320 reindeer were introduced from Siberia, and now, from these original reindeer, Alaska has a total of about 25,000.

If the reindeer should increase in the future as rapidly as they have hitherto, the reindeer industry will occupy an important place in the northern part of Alaska. Perhaps in the near future, reindeer-meat will be consumed in larger quantities. Therefore, the study of diseases of the reindeer, and especially the peculiar meat infections, would be of much benefit.

About reindeer diseases we know very little. The study of these diseases has only recently begun. Notwithstanding, the reindeer suffer badly from different diseases and different parasites, some of them already having been described by investigators.

With reindeer imported from Siberia were also introduced into Alaska certain diseases and parasites peculiar to these animals.

Last year (1910), I described in a Russian magazine (*Archive Vet. Med. Sciences*, 1910, No. 7, St. Petersburg), the bladder-worm, which I had found in reindeer hearts and muscles in Jakutsk Province, in the northern part of Siberia. The bladder-worm has a head with four tentacles and crown of 26-30 hooks. I most frequently find the bladder-worm in reindeer that look weak and ill.

In what way did the reindeer become infected with the bladder-worm? From what animal did it get the eggs of the tapeworm? What animal developed tapeworm in the intestines from the reindeer bladder-worm? In answer to these questions, we must say: until a more thorough investigation has been made, we cannot explain scientifically in what way the reindeer became infected with the bladder-worm nor the origin of the tapeworm.

In a large book about animal parasites written by Prof. J. Neuman, in French, but translated into English, we find something about the reindeer bladder-worm. He says that this parasite had been discovered in the flesh of reindeer which died in the Zoological Park in Paris, and that feeding the infected flesh to dogs produced tapeworms in the intestines of the dogs experimented upon. So far, this is all that we know about the parasite infections of reindeer.

The thought follows: can man be infected by eating reindeer flesh containing the bladder-worm? This is at present unknown. However, this possibility can be supposed because we know that some tapeworms, which usually live in the intestines of the dog, can be developed in the intestines of man if he occasionally eats the flesh of the same animal that ate the dog having bladder-worm.

This year (1911), I had the opportunity to inspect some of the reindeer herds in Alaska. While inspecting a large herd in Golovin (Seward Peninsula, Alaska), I noticed one small fawn which looked badly, was ill and lame. The superintendent of this herd decided to butcher the sick fawn, and several other reindeer for meat. All of the large herd of about a thousand reindeer was in very good condition and nutrition. We could notice only one sick animal, the small fawn which was butchered.

By an autopsy of the killed fawn, we found many bladder-worms in the heart, liver, muscles of the neck, shoulders and other parts of the body. In the peritoneum of the fawn, we found the same bladder-worms also, but larger than in the muscles and liver. Microscopical examination showed that there

was swimming in the fluid of the bladder the head of a parasite with four suckers and a crown of 26-30 hooklets, looking like the head of the *cysticercus cellulosæ*. It was the same which I had found in the reindeer of North Siberia.

The same bladder-worms were also found in the heart and in the peritoneum of one of the other butchered reindeer which was well-nourished and in good condition, but in very small quantities. This parasite, if present in large quantities is very injurious.

The injuries are brought about, not only by direct influence of the parasites upon the nutrition and removal of the blood or of nutritive substances, but also by the formation of poisonous substances which are contained in the fluid of the bladder, and so producing auto-intoxication of the animal or host. Thus the affection effects the general nutrition and causes disturbance and prostration.

There is a probability that man may be infected by the tapeworm if he eats rare reindeer meat, which contains the parasite.

Investigations about the transmission and infection of this vermin must be undertaken for two reasons:

First, the parasite is harmful to the reindeer, inasmuch as it affects the organism and intoxicates it.

Second, probably reindeer meat, containing bladder-worms (*cysticercus rangiferi*), could transmit infection to man and eventually tapeworm would develop in the intestines of the man who consumed rare reindeer meat.

It is necessary to remember that the tapeworm (*tænia*), which develops in the intestines of man is not as harmless as many people think. Sometimes the tapeworm can cause a great deal of trouble, and it is well known that there are cases in which tapeworm produces the death of the patient by vomiting.

Therefore, bladder-worm of the reindeer (*cysticercus rangiferi*), demands our attention, both as regards the increase and welfare of the animal itself and the danger of reproducing tapeworm in man.

## CATTLE PLAGUE.

By JACQUES E. AGHION, V.S., VETERINARIAN STATE DOMAINES, SAKHA,  
EGYPT.

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Cattle plague is a highly contagious disease of bovines producing high fever, and characterized by an eruption of pustules on the mucous membrane of the mouth. According to Semner the affection is due to a streptococcus, which he cultivated from the blood and lymphatic glands of animals suffering from cattle plague. A calf inoculated with the cultivated virus died in seven days. The cocci were said to lose their virulence by successive cultivation, and a protective vaccine was thus obtained.

Now, by inoculating the virus, the disease manifests itself and causes the blood to undergo such a morbid change that the amount of fibrin is largely increased, while the amount of serum is decreased.

The period of incubation varies from four to eight days, at the end of which time the symptoms of the disease are well developed.

My purpose in writing this paper is not to describe the disease from a scientific point of view, but only from practical observations as seen every day in the field.

About a year ago I was called into different farms to see cattle suffering from what I diagnosed to be cattle plague. Losses were enormous, as many were lying dead and others suffering from the disease and showing the following symptoms:

Rise of temperature from 102, 103 and, in some cases, 104° F. This rise of temperature precedes all other symptoms. An eruption on the mucous membrane of the mouth and lower lip was seen. Loss of appetite; dullness; redness of the conjunctiva; typhoid state, that is, drooping head, hanging ears, etc.; slight cough; oppressed and difficult breathing; sunken eyes;

fœtid breath; diarrhœa; discharge from the eyes, nose and mouth; weak heart; grinding teeth; arching back; weakness in the limbs, and now the temperature rapidly falls down and the animal succumbs. I would like here to draw the attention of the readers to the fact that the above symptoms are not always present, but I was able in many cases to diagnose the disease by the rise of temperature, redness of the conjunctiva, eruption of the mouth and diarrhœa.

The history of cattle plague in Egypt dates as far back as 1840, when the first outbreak made its appearance, followed by that of 1865 and 1881, 1882 and 1883. The contagion was traced then to cattle imported from Russia. The disease stopped, to appear again in 1902, when it spread all over the country; no province in Upper or Lower Egypt was free from it; and it is very difficult indeed in some cases to account for the origin of the contagion; but I was fortunate in more cases than one to trace it either as due to butchering plagued animals, coming into actual contact with their blood, transmitting the disease to healthy animals by looking after or coming into contact with them, or by means of the flies which, after resting on affected animals or their offal material, their saliva, etc., fly about and alight on healthy ones conveying the disease.

Cattle plague runs a definite course and usually terminates fatally; still, few cases tend to recovery, and when such takes place the animal is rendered unsusceptible to another attack and remains healthy whilst surrounded with the plague.

The proper step to be taken so as to deal with eradicating an outbreak is, strict isolation of suspected animals; inoculation of healthy ones; burning and burying the dead or killed plagued animals; disinfect stables and all surroundings; prohibit all contact with the sick or suspected animals.

Post-mortem examination of some of the dead animals showed the following lesions:

Congestion of the mucous membrane of the mouth. The rumen impacted with undigested food, and in many cases a foreign body was found; patches of congestion and sloughing

of its mucous membrane was not unusual. Congestion and impaction of the third stomach; the fourth stomach was red and studded with superficial erosions. The intestines were marked with patches of red. Emphysema of the lungs was in most cases present. The heart was dilated and covered with petechial spots. Liver dark in color and gall bladder full of bile.

A DETAILED notice of the approaching meeting of the Colorado State Veterinary Medical Association will be found on page 408 of this issue of the REVIEW.

AGITATED Old Gent—Quick! My daughter is overboard! Save her, and she shall be your wife!

Blasé Person—Wait till a wave rolls her over and I can see her face!—(*Puck.*)

SHOEING HORSES AT HORSE SHOWS.—Horseshoeing competitions continue to be very popular at the summer shows, no matter what part of the country they are held in, says the *London Live Stock Journal*. This should, and undoubtedly does, mean that much useful knowledge is spread among those who have the care of horses' feet, than which there is no part of more importance. A well-made shoe, properly fitted onto a foot which has not been cut away at the sole or rasped thin round the walls, is the ideal of those who judge the work, and the country blacksmith who knows more than others can tell him is becoming rarer to meet.—*Rider and Driver.*

How long does a horse live? That question is now being raised in different stables and has received varying answers. One horse, lately owned by Joseph Guest, a Maryland farmer, was 42 years old, when given chloroform, a few months ago. Another is a Texas pony, owned in Iowa, now 43 years old. Both horses have been working steadily up until one year ago. It is reported that a work horse lived in Manchester, England, for 62 years, and died of old age. Such evidences of longevity bring up another question, and that is the value of a horse. The horse that lives throughout a generation and bears the burdens of his owner, is worth many dollars. One mare, in Kentucky, costing originally less than \$100, lived more than a quarter of century and produced colts that sold for \$18,000. What was she worth as a business investment?—(*Horn and Hoof.*)

## REPORTS OF CASES.

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### BLACK TONGUE IN DOGS—BURSATTI IN HORSES— POLY-VALENT VACCINES.

By FRED W. PORTER, D.V.M., Tampa, Fla.

On reading the October number of my VETERINARY REVIEW I was pleased to find Dr. Dalrymple's short sketch on "Black Tongue of Dogs." It is a condition that I am constantly called upon to deal with here in Florida, and it is rather evident that Dr. Dalrymple does not care to bother with it. I certainly do not blame him for that.

My observations do not agree with his, that the condition is chiefly confined to hunting dogs, or those kept in the country. I find it quite as common among my city patients as I do among dogs kept out of town. Moreover, while I have obtained many animals from the city pound for experimental purposes, I have never seen a case among dogs that were purely scavengers.

I note that Dr. Dalrymple says nothing as to the highly contagious nature of this malady. To me it is highly so, both by actual contact and from the use of yards or quarters, by healthy animals, where the disease has been present. I have on several occasions seen the disease develop in bulldogs placed in yards months after the original case had died, the yard not having a dog in it in the interim. Oral infection, from the devouring of carrion, is contradicted in this region by the fact that our woods do not contain carrion. Even a carcass as large as that of a horse or cow is taken care of within a remarkably short time by our carrion crow, buzzards and red ants. What is left is thoroughly dry-cured.

As to treatment, I must admit at the start that most of my cases die. However, when I can find an owner that will give the necessary nursing and follow directions, I have been successful in persuading a fair number to get well. Above all things, keep

them outdoors; I have never known a case to recover that was kept in a house. General disinfection, antiseptics and, still more important, not allowing the animal to starve to death, is the line I follow. U. S. P. formula,  $\text{HNO}_3 + (\text{HCl})_4$ , ten drops to a half pint of drinking water, and allow no other drinking water; will be found a very thorough prophylactic as well as a curative. It can be used to advantage among all dogs, whatever their condition. Where an animal cannot swallow, it can be given one or two drops in a tablespoonful of beef broth, administered from four to six times daily.

My last case I pronounced fatal when it was presented for treatment. Ropy salivation, no deglutition, necrotic breath, emaciated and almost unable to stand. The owner was very anxious to try something, so we got some Hamburger steak, made bolus of it about the size of a marble and dropped two or three of them down his throat at intervals of a couple of hours. It took forty-eight hours to get him where he could voluntarily take food, and then he needed coaxing. But he went home convalescent in a week's time.

As to serums, I have tried them, but as yet have found nothing to depend upon.

To leave the dog and go among the larger animals, some months ago you reported some cases of "bursatti" from California, and in the current number, page 116, it is again spoken of. Here in Florida it is a very common condition during our annual rainy season. We know it under the term "leechs," and it has several forms. About two years ago I had a case of canker of the sole that I was treating with autogenic vaccines. A leech sore, almost surrounding the fetlock, was a concurrent condition. To it I was paying no particular attention beyond dusting it with drying powders. As the case progressed I noticed that the leech had ceased to be an ulcerating sore and showed healthy healing. Both conditions got well about the same time and the animal has been in service ever since, with no recurrence. Since then I have treated numerous leech cases with poly-valent vaccines, both stock and autogenous. And they simply get well. I have seen no mention of this application of serum therapy elsewhere and simply give it that others may try it out.

These observations are from a purely practical viewpoint. I am too busy to get at the scientific niceties of the case, and anyhow, in practice, what the owner wants is a well, serviceable animal.

## ADENOID GROWTH IN NOSTRIL.\*

By F. J. TRAFTON, V.S., Jefferson, Iowa.

*Subject.*—A draft colt three years old.

*History.*—The animal came up after being turned out in stocks a couple of weeks with a growth which had the appearance of a large red apple, half of which protruded from the nostril; the stenosis being complete on that side and partial on the right side. The nose on the left side was swollen to just below the eye. The eye was also affected, as the mucous membranes were icteric in color and some discharge trickled over the cheek, indicating an association with the growth in the nostril.

*Diagnosis.*—After placing the animal on the operating table, securing same in proper position, I administered one H.M.C. tablet, formula A, and then gave chloroform enough to complete the anaesthesia. Now I proceeded to examine the nasal cavity and growth to ascertain the origin and extent of same. On palpation I found the lower two-thirds of the nostril emitted a dull sound, as though it was a solid mass, and above this the sound was hollow and the parts very tender to touch. I then passed my index finger next the septum of the nose and followed it to the lower end of the calcified portion of the septum, and there I found an attachment, and further examination revealed a narrow attachment to same for about three inches, then it changed its course. I then trephined the nasal cavity to the maxillary bone within two inches of the median line, making two cuts and taking out the middle with a chisel and saw; then I inserted my finger and found the growth to extend to the upper outer portion of the nasal cavity just below the eye, the attachment being about a half inch in diameter.

*Prognosis.*—Reserved.

*Operation.*—I removed the attachment to nasal septum by means of scissors, then removed the upper portion by means of torsion and a curette and scraping the growth loose and using torsion at the same time until it was entirely removed from the bone. I then arrested all hæmorrhage and this completed the operation.

*After-Treatment.*—I painted the surface on its upper attachment with tincture of iodine, U. S. P. disinfected, and plugged trephine opening with absorbent cotton saturated in creolin solution, used swab and applied tr. iodine to inner surface of nasal

\* Read before the Missouri Valley Veterinary Association, Omaha, 1911.

cavity and removed to box stall and repeated treatment twice a day for twenty-one days; and when the animal left the hospital it was completely cured except the trephine opening, which was treated by owner of animal at home. This is the first case of its kind brought to my notice since I have been in practice.

*Cause.*—Who can advance a cause? Was it hereditary, as in the human family, or not?

### MACROSCOPIC LESIONS IN MARE KILLED BY ELECTRIC SHOCK.

By JOHN F. WINCHESTER, Lawrence, Mass.

*"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."*

The following macroscopic lesions of a white mare that was killed by contact with a rail of an electric street railroad may be of interest. This occurred in front of the power station, the animal being between a moving car and the generator.

All visible mucous membranes were cyanotic. The mare was on her right side; she had passed urine and feces at the time or after falling. No bloating. This condition was observed about an hour after death, at 9 p. m., December 22, 1907.

The following morning, December 23, the autopsy revealed the following:

Bloated, cyanosis of all visible mucous membranes and the peritoneum: pupils dilated. Removing the skin, the radial veins of the right hind leg were hyperæmic, also the larger ones: the blood fluid and dark.

The corresponding vessels of the left hind leg not so pronounced; but when the veins were cut the blood flows freely.

The superficial blood vessels on the left side of the neck hyperæmic, while those on the right side were ecchymotic. The mucous membrane of the trachea was ecchymotic in the thoracic or lower third. Ecchymosis on large colon, kidneys, spleen, liver and lungs.

Radials of pericardium hyperæmic, and this sac contained a small amount of amber colored fluid.

The left heart held a little fluid blood beside a small, amber-colored clot. The right heart empty.

Post mortem showed a rupture of diaphragm; the brain on exposure showed well-marked hyperæmia, especially at the base of the cerebellum.

Both choroid plexi hyperæmic and the substance of cerebrum ecchymotic.

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### CALCULUS IN A MARE.\*

By J. F. CAREY, D.V.S., East Orange, N. J.

Mr. President and members of this association, when I agreed to read a paper at this meeting I was hardly aware of the time and work it would require, in order to present something worth your time and attention.

It was somewhat difficult to select a subject, not because of lack of material, for we all know there are plenty of diseases in veterinary medicine. But to select something that I could treat with brevity and at the same time bring something of interest to you. I finally decided to write upon a case that I had under treatment.

I was called to see an aged grey mare suffering presumably from colic. Under treatment pain subsided. The following day she was attacked with same sort of pain, difficulty in urinating and bowels slow to operate.

The rectum was covered with a mass of melanotic tumors, and occasionally, when the bowels would move, from the consistency of same, and fetid smell, I concluded that trouble was due to obstruction by the tumors, and so informed the owner. However, mare lingered along for three weeks in periods of pain and ease; some days bowels moving and some days no movement; and when bowels did pass, the consistency of same was very soft, black and fetid. At the end of three weeks' time, the mare was again attacked and died.

Post mortem was held and upon search in the large intestines instead of melanotic tumors a calculus, weighing  $3\frac{1}{4}$  pounds was found, which I present before the meeting this evening.

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\* Presented before the Essex County (N. J.), Veterinary Medical Association.

## RABIES IN MAN.

By Dr. W. B. PROTHERO, Johnstown, Pa.

The patient, a coal miner, visited the office of Dr. Keiper in Johnstown, Pa., September 28, 1911, complaining of illness, but apparently not of a serious nature. The doctor prescribed treatment and dismissed the case as nothing unusual. The following morning about 3 o'clock Dr. Keiper was called and found his patient bound with ropes and showing signs of violence. He suspected delirium tremens and ordered the man to be taken to the Johnstown City Hospital. The condition of the patient became worse and rabies was suspected. The patient had been bitten by a dog some weeks previous. The patient was about twenty-eight years of age and bound by each wrist to a small iron bed.

The similarity of symptoms in man and animal were plainly shown. He assumed a sitting position, reaching each way as far as his bonds would permit, continual working of jaws apparently from spasmodic contractions of the muscles, some dribbling of saliva, attempts to bite were due to involuntary muscular contractions, eyes wide open, and a straight staring look. When a glass of water was held to his mouth he attempted, almost ravenously, to drink, but this effort brought on frightful paroxysms. Emissions of semen escaped from an erected penis. He had no knowledge of the nature of his disease, but at intervals would articulate a few words well and beseechingly request that he be killed. He seemed to understand what was said and gave his age correctly when asked to do so. He realized that the shackles that bound him were fastened with buckles and attempted to unfasten them. The voice was very much changed. The respirations were hurried and much aggravated during spasms. He was given sedatives in conjunction with chloroform inhalation. Death took place at six o'clock the following morning.

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DR. S. H. GILLILAND, of Marietta, Pa., has accepted the Directorship of the Pennsylvania Department of Health Laboratories, located at No. 2000 Arch street, Philadelphia. Dr. Gilliland has the REVIEW's best wishes in his new field of usefulness.

## ABSTRACTS FROM EXCHANGES.

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### ENGLISH REVIEW.

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

FRACTURE OF THE TIBIA IN SIXTEEN-YEAR-OLD HORSE—RECOVERY [*A. Goodall, M.R.C.V.S.*].—He was found in the morning with the fracture on left hind leg, which was diagnosed as located in the lower third of the bone without any displacement. The case occurred in a small up-country town of East Griualand, where slings had to be improvised with wool bales padded with sheep skins. The animal was placed in those and showed himself very quiet in them, never struggling. A padded pole was placed just under the buttocks so that the horse could sit on it for hours and rest. The leg was enveloped with cotton wool and bandaged from the stifle down to the hock with stout canvas bandages over which ordinary melted pitch was smeared, on several layers and when set was as hard as a board. The limb was bandaged with ordinary bandage and also the other legs. In four weeks, the horse put some weight on his leg, in six weeks he stood firm on it and in eight the dressing was removed. His recovery was uninterrupted. Two injections of morphia in the first two days and now and then occasional doses of sulphate of magnesia were the only medicinal treatment given. The animal, which was a valuable stallion, served twenty-five mares the following season. He died since with septic poisoning from a wound on the other leg. The examination of the tibia showed a shortening of  $2\frac{1}{2}$  inches on the injured leg.—(*Vet. Record.*)

EQUINE MELANO-PSAMMOMATA OF THE BRAIN [*W. M. Scott, F.R.C.V.S.*].—Aged grey mare worked well up to day of illness. Symptoms: suddenly attacked, restlessness, profuse perspiration; various nervous manifestations, extremely irritable, shaking of the head, pushing to the wall, gnawing, etc. Mucous membrane injected, pulse full, temperature  $104^{\circ}$  F. Pupils dilated. Retinal vessels distended. Cerebral symptoms of hyper-

hœmia subsided at intervals and followed by depression and coma. On the second day, paresia took place, ears muscles paralyzed, also those of mastication and deglutition. Amaurosis is present. Locomotion staggering. The animal remained in that condition for few days following, when she improved and was able to go to work after a while. Relapse took place, when in another attack the mare died. Post mortem showed basilar artery varicous, organized clot at the branching off of the internal carotid, in each of the hemispheres of the cerebellum there was a neoplasm, weighing  $3\frac{1}{4}$  and 2 ounces, respectively. They were dark grey, on section varied in color from dark grey to black and on squeezing gave escape to inky-colored fluid. The mare had no melanosis round the anus or in other regions. The treatment consisted in purgatives, aconite, nervous sedatives, alteratives, strychnine and injections of saline water.—(*Vet. Journ.*)

KERATOMA FROM A PICKED-UP NAIL [*Capt. A. J. Williams, F.R.C.V.S., A.V.C.*].—Aged cob had a punctured wound, near-hind foot from picked-up nail. Treated and sent to work in 18 days—from this at various intervals became lame with suppurating gathering which was relieved by indicated treatment, until finally it resulted in a condition which would require removing a large portion of the wall and as the animal was too old, and not worth treatment, he was destroyed. Post mortem examination revealed a keratoma growing from the horny lamina, extending from the sole to the cutigeral groove with a cavity running up the centre of the growth.—(*Ibid.*)

FRACTURE OF THE 5TH AND 6TH LUMBAR VERTEBRÆ [*By the same*].—Five-year-old cob running in a race dropped his hind legs in a small ditch, fell and was unable to rise for a while. After being up, he shows considerable pain, moves in putting little weight on the near-hind leg, has occasional knuckling at the fetlock, crepitus is heard about the quarter region. After laying down, complete paralysis was manifested and the animal was destroyed. Post mortem: Superior spinous processes of the 5th and 6th lumbar vertebræ were broken off close to the neural arch, portions of the lateral walls of the neural arch of the 5th vertebræ were broken off and also that of the 6th completely. The extremities of the transverse processes of both bones were fractured on the left side.—(*Vet. Journ.*)

EVERSION OF THE BLADDER IN A MARE [*Prof. Frederick Hobday, F.R.C.V.S.*].—A Shire mare has a complete eversion of the bladder after unexpectedly having foaled of a living foal. Attempt to reduce the eversion could not be made, notwithstanding the administration of morphia and the application of hot water. After 48 hours that the eversion had taken place, the mucous membrane was thickened and inflamed, the ureters were visible and the urine collected in a pouch of the vagina from which it was ejected in a squirting stream. Hot chinosol solution and massage were resorted to and reduction attempted. At first with the fingers and the wooden end of an ordinary horse enema syringe and when the length of this was found insufficient to return the fundus of the bladder through the urethral orifice, it was replaced by a pessary composed of a small rounded glass pestle firmly tied into the end of a piece of garden hose pipe. All this sterilized and vaselined was inserted into the fundus and the reduction completed. Cold chinosol lotions into the bladder completed the cure.—(*Ibid.*)

SUB-SACRAL ABSCESSSES [*H. D. Jones, M.R.C.V.S.*]:

*First Case.*—Six-year-old gelding, returned from military manœuvres with his tail slightly thickened and showing several small abscesses on the under surface. He had been docked, not recently, but the stump of the tail appeared healthy. There were also two small abscesses at the root of the tail. These were opened, and discharged pus suspicious of *Botriomyces*. Tinct. of iodine externally and iodide of potass. form bases of treatment. However, the tail enlarged and puss became more abundant. Animal shows signs of systematic disturbance and amputation of the tail was resorted to. It was removed as close the sacrum as possible. The stump was found full of sinuses with pus in great quantity between the skin and the vertebræ. After six weeks animal has recovered.

*Second Case.*—Five-year-old grey gelding has the middle of the tail badly bruised. In a few days it began to swell. Several incisions let out a large quantity of pus. Numerous abscesses appeared on the under surface of the tail and the tendency to spread was always in an upward direction. Soon pus appeared at the sides of the anus and could be squeezed out from under the sacrum. Amputation had to be resorted to, also as close to the sacrum as possible. The hemorrhage was difficult to control, but the animal got entirely well after about seven weeks.—(*Vet. Record.*)

**HYPODERMIC INJECTIONS OF QUININE FOLLOWED BY TETANUS** [*T. Lishman, Lieut., A.V.C.*].—Record of a case of acute biliary fever accompanied with temperature of 106° F. on four occasions. On alternate days, three subcutaneous injections were made of bihydrochloride of quinine. Each seat of inoculation on the following day showed a painful diffuse swelling about 9 inches in diameter. These swellings were surrounded by indurated periphery and became fluctuating. Lanced, they gave escape to one or two ounces of clear fluid, leaving a cavity with walls indurated. After a few days, a certain amount of sloughing took place in the subcutaneous tissue round the cavity. Ten days after these manifestations and from the day of the first injection an attack of tetanus set in, which was so severe that the animal had to be destroyed. The author states that most particular care had been taken with regard to asepsy and that the quinine had been dissolved in boiling distilled water which had been allowed to cool slowly.—(*Vet. Record.*)

### FRENCH REVIEW.

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

**DYSTOKIA IN A LIONESS—ANTE-PARTUM UTERINE LACERATION—PERITONITIS—DEATH** [*M. Mellis, Sanit. Veterinarian*].—This animal was four years old and primiparous. One morning she had a rupture of the placenta and escape of its contents. In the afternoon she is uneasy and late in the evening a fœtus has its hind quarters hanging out through the vulva, held by its thorax; and notwithstanding violent efforts, the lioness cannot expel it. With much difficulty the animal could be secured and the fœtus was pulled out with the envelope. It was dead since one or two days. Although the animal was somewhat relieved, the sequelæ did not look very favorable. The animal refused all food, solids or liquids, constipation set in, the abdomen became tympanitic, vomiting took place and the animal finally died. The abdomen contained some blackish liquid, and the organs had a dark greenish coloration; they were the seat of general congestion. The uterus swollen, blackish and thickened had the right cornua larger than the left. On the right and on the level of the two horns there was a solution of continuity in which was engaged the bone of the cranium of the second fœtus, whose body was in the right horn. As some few days before, while working with other animals, this lioness had been squeezed

against a wooden partition, it is probable that at that time the rupture of the uterus took place.—(*Rev. Véter.*)

QUADRUPLE GESTATION IN A MARE [*Capt. Chauvain, Army Veterinarian*].—Covered the 19th and 22d of May—she refused the stallion on the 29th, but becoming in heat a few days later, she is a last time mounted on the 5th and 8th of June. In March following, after nine months and a half of gestation, she aborted of a fœtus as big as two human fists, surrounded with a sticky large mass in a putrefied envelope similar to that of an ordinary colt. About fifteen minutes later, she had another male colt, a little smaller than a hunting dog; he just gave a breath and died. Twenty minutes later, she gave birth to two other colts, immediately one after the other. One, a bay male, was like the second, but smaller. He was not alive. The other was a brown filly, bigger than the others and full of life for twenty minutes, moving her legs, her tail and the head and neck slightly. After such laborious delivery, the mare remained several days somewhat depressed, but soon got over it.—(*Rec. de Med. Vet.*)

MELANOTIC TUMOR AND FACIAL PARALYSIS IN A HORSE [*Mr. A. Daire*].—Light grey horse, aged 28 years, had difficulty of mastication. Teeth are fixed. After a few months, although he has improved and gained flesh since that operation, he again refuses solid food and seems unable to work as well. His teeth are in good condition. Hay is offered to him, he takes hold of it and soon lets it drop in the manger. Suspecting a melanotic tumor on account of the color of the animal, a close examination is made of the parotid region and on the left side, along the border of the lower maxillary is detected a hard body, bosselated, as big as a nut. The superior lip is drawn towards the right. The tumor is evidently pressing upon branches of the 5th pair of nerves and some paralysis is the result. The prognosis appeared serious as the neoplasm may extend deeply. A friction of absorbing nature was made and fortunately followed by an arrest in the development of the tumor, thus relieving the commencing paralysis and the difficulty of mastication.—(*Rec. de Med. Vet.*)

ACTINOMYCOSIS OF THE INTERMAXILLARY BONE COMPLETELY CLOSING ONE NOSTRIL [*P. Chausse, Sanitary Inspector*].—Four-year-old steer, in fair condition, presented this interesting case. Ordinarily the disease starts on a level with the first upper or lower molar teeth, inoculated in the alveoli when those change with the progress of dentition.

In this animal the trouble is altogether at the extremity of the intermaxillary bone. The inoculation has taken place on the left and external side of the incisive bourrelet, that is through a very hard resisting tissue, yet exposed to injuries at the time of prehension of food. There is a point of inoculation, a kind of ulceration of the mucus, and from the incisive bourrelet the growth has extended to the bone, which is hypertrophied, and gives the nostril a peculiar appearance, forming a tumor closing it entirely. The microscopic examination revealed the true nature of the lesions. The animal had some difficulty in breathing and taking hold of his food, but at the same time did not seem to be much annoyed by this peculiar location of actino-mycosis.—(*Bullet. de la Soc. Cent.*)

PRIMITIVE ULCEROUS TUBERCULOSIS OF THE SKIN AND SUBCUTANEOUS TISSUE IN A COW [*Mess. E. Pocard, Adjunct Professor, and J. B. Vittoz*].—This is an exceptionally rare lesion observed in a Normandy cow, aged seven years, which since six weeks has had a swelling on the left side of the thoracic cavity. It is as big as the fist, bosselated, hard, adherent to the skin, but movable on the deep muscular layers underneath. In its highest point the skin is ulcerated and there are two fistulas from which ooze thin abundant pus. Round and back of the tumor smaller ones are felt. The precural lymphatic glands are hypertrophied. Nothing is abnormal in the respiratory apparatus. Tuberculosis is diagnosed and confirmed by microscopic examination and by tuberculine test. At the post mortem, the tumor was found adherent to the panniculus muscle and surrounded by numerous small tubercles. Smaller subcutaneous nodules are found in condition of diffuse caseation. The precural glands are the seat of numerous tuberculous lesions. The other glands through the organism are more or less hypertrophied, except those of the digestive apparatus and of the lungs which are in appearance free from infection. The isolated case of ulcerative dermatitis of tuberculous nature was evidently a primitive lesion.—(*Bullet. de la Soc. Cent.*)

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### ITALIAN REVIEW.

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

GIANT CELLS ANGIO-SARCOMA IN A CHICKEN [*Doct. G. Lisi*].—A hen aged five months in good condition was observed

losing her appetite and breathing with difficulty. After a few days these symptoms became more serious and the animal lost flesh rapidly, being soon in a state of marasmus. The animal was killed, and sent to the author for autopsy. The abdominal and thoracic cavities were the seat of the lesions. In the former there were on the lower border of the left side of the diaphragm, two tumors of different sizes. The largest measuring three centimeters in diameter and the other two. On the right side and in the same position there was a smaller tumor. In the thorax in front and close to the cardiac auricles there was a tumor of the same kind and again another near the vertebral column opposite the first dorsal vertebræ. There were no other lesions in any part of the carcass. The tumors were surrounded with a delicate membrane of connective tissue and on section had a granular aspect with a pale, rosy coloration. Formed of three concentric layers, the examination with the microscope revealed their nature, that of giant cells angio-sarcoma, a lesion rather rarely observed in our domestic animals.—(*Il Nuovo Ercol.*)

GRANULAR VAGINITIS IN COWS [*P. Stazzy*].—After some bibliographic notices, the author passes a concise review of the etiology, symptoms, histology, etc., of the disease and arrives at the following conclusions:

1.—Keep as much as possible at liberty in good pastures all the cattle and specially the animals that are in advanced pregnancy.

2.—Disinfect thoroughly by washing with soap and soda the hind legs, thighs, tail, feet of the animals.

3.—Disinfect with boiled and slacked lime the stalls and harness.

4.—Wash the bull before and after the mounting of the cow with solution of lisoform or other antiseptic.

5.—Have the animal properly treated by a veterinarian; stopping the treatment when they are in heat.

6.—During the period of heat and specially a few minutes before the cow is served, make an intra-vaginal injection with tepid solution of carbonate of soda.

7.—Not to use any medicamentous bougies or pessaries with the cow. If the animal needs it, ointment of belladonna or some non-irritating antiseptic may be resorted to.

8.—Keep off from the stables any animal with chronic metritis or that which is no more in heat.

9.—An injection of watery solution of tincture of iodine shall be made in the uterus after delivery to disinfect it.—(*La Clinica Veterin.*)

AN ABNORMAL CASE OF UTERINE TORSION IN A COW [*Dr. Ottorino Mancinelli*].—Six-year-old cow has been due to deliver some time. Some twenty days ago she has shown some peculiar manifestations, which, however, proved negative and she apparently recovers. But now she seems to have colic, since a few days she makes expulsive efforts, and when these stop she appears less lively and her appetite is failing. When called the author finds her lying down, pulse is weak, respiration accelerated, the body is covered with cold perspiration. The ears are cold, vulva swollen—mucous membrane congested. When examination is made per vagina, the condition revealed, folds at the neck which justify a diagnosis of *incomplete torsion from the right to the left*. The fingers have passed partly through and felt the feet of the foetus, but not sufficiently to secure them with ropes. Rolling treatment is applied in the ordinary way with all attention and care possible. But the unfolding seems impossible and after a painful attempt lasting about five hours the cow dies. At the post mortem lesions of peritonitis were found in the abdominal cavity. But the interest was on the condition of the uterus, which was cyanotic in color and the seat of peculiar twisting. The left cornua contained the foetus and showed two torsions. One incomplete nearer the vagina had a direction from right to left and the other nearer the posterior end of the organ at about 25 centim. from the first, leaving between the two a space and reducing the cavity of the horn which was thus divided into two pouches. In the posterior, which was the smaller, there was the front part of the foetus, head, withers, neck, shoulders and anterior extremities. In the anterior sac, was the balance of the body, back, abdomen and hind leg. The foetus was well formed, rather of small size, with all the hairs removed and a beginning of maceration. He was dead probably since 10 days.—(*Il Nuovo Ercolani*.)

INVAGINATION OF THE COLON IN A STEER [*Dr. Arturo Sciazzelli*].—The symptoms exhibited by the animal are thus described by the writer. At first the animal manifested loss of appetite, diminution of rumination, great thirst, fullness of the left flank, eructations, tympanitis, defecations small and rare. Later the condition became aggravated. Complete refusal of food, arrest

of rumination and defecation. Colic at first gradually severe and thus subsiding little by little after lasting several hours. The animal assumed frequently the position of a dog sitting on his rump. When standing up the hind legs were brought under the body and the back was arched. Walking was slow, difficult, the hind legs kept apart. Rectal examination revealed an empty rectum, no feces but some mucus and clots of blood. In the fore part of this cavity, downwards and to the right there was felt a cord, sausage-like body, hard, irregular, quite big, which indicated an anatomical alteration of the intestine. Rather than resort to a surgical operation, the steer was sent to the butcher. At the autopsy, there was found some little serosity in the abdomen, with the contents congested. The invagination was involving part of the colon, some 28 centimeters long, the cavity of the intestine being reduced to merely a small fissure completely blocked up by blood. All the other contents of the abdomen were healthy.—(*Il Nuovo Ercol.*)

DIFFUSED ECHINOCOCCOSIS IN A STEER [*By the same*].—Record of the post-mortem examination made where a large number of echinococci cysts were found in a steer that had died suddenly. The animal was six years old, in perfect condition and had never presented any apparent signs of illness.

In the abdominal cavity, two cysts were found, free, as big as a hen's egg, there were seven others adherent to the mesentery and the peritoneum. They varied in size between that of a pigeon's egg to that of a nut. The stomach and intestines were normal. The liver that weighed 16 kil. 950 contained a large number of cysts, principally on the right lobe, where they had collected and gave it the aspect of a small cauliflower. Only one cyst was found in the spleen. It was as big as the fist of a boy. The pancreas and kidneys were healthy.

In the thoracic cavity: the lungs were literally packed with cysts, some of which were the size of a man's fist. The gathering of the cyst was such that on their surface the lungs were irregular, bosselated and squeezed down. In the heart, the external appearance seems sound, but in the thickness of the walls of the left ventricle there was a very large cyst. There was one also near the left auricle with two others looking towards the auricular cavity. There were none in the brain. It is quite surprising to find an animal so extensively diseased and yet having all the appearance of good health as this steer had.—(*Ibid.*)

## BIBLIOGRAPHY.

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### MICROBIOLOGY.

MICROBIOLOGY, by Charles E. Marshall, Professor of Bacteriology and Hygiene, Michigan Agricultural College, Octavo of 724 pages, with 128 Illustrations. Philadelphia, P. Blackiston's Son and Company, 1911. Cloth, \$2.50 net.

This work is designed for students, and its plan has been to furnish basic principles, to train the mind in logical development and adjustment, and to prepare the student to undertake an intelligent study of strictly professional or practical subjects. With this in mind, the text has been divided into three distinct parts: *Morphological and Cultural*, or that which deals with forms and methods of handling; *Physiological*, or that which deals strictly with functions, the key to the applied; and *Applied*, or that which reaches into the application of the facts developed to the problems met in the study of professional or practical affairs of agriculture or domestic science. The latter calls for the treatment in such a manner as to make it basic to the interpretation of such subjects as air impurities, water supplies, sewage disposal, soils, dairying, fermentation industries, food preservation and decomposition, manufacture of biological products, transmission of disease, susceptibility and immunity, sanitation, and control of infectious or contagious diseases. All progressive veterinarians, physicians, sanitarians, scientific agriculturists, and many other scientists are *students* of the subjects enumerated above; and embraced in *Marshall's Microbiology*; hence its value to these several classes of *students*. Realizing the breadth of a work under the title of *Microbiology*, the editor surrounded himself in this undertaking, with no less than nineteen collaborators, or contributors; all men of national or international fame. So that the work is especially valuable because each subject is treated by a *specialist*.

It would be impossible in a review of this kind to give all the authors of the several divisions and subdivisions of the subject under consideration, but we believe it will suffice for most of our readers, to give the names of those that have contributed

to this work, in order for them to judge of its character and its scope. We therefore append them:

E. T. Bioletti, Berkeley, Cal.; R. E. Buchanan, Ames, Ia.; M. Dorset, Washington, D. C.; S. F. Edwards, Guelph, Can.; W. D. Frost, Madison, Wis.; F. C. Harrison, Macdonald College, Can.; E. G. Hastings, Madison, Wis.; H. W. Hill, Minneapolis, Minn.; W. E. King, Detroit, Mich.; J. G. Lipman, New Brunswick, N. J.; W. J. MacNeal, Urbana, Ill.; E. F. McCampbell, Columbus, O.; Earle B. Phelps, Boston, Mass.; Otto Rahn, East Lansing, Mich.; M. H. Reynolds, St. Paul, Minn.; W. G. Sackett, Fort Collins, Colo.; W. A. Stocking, Ithaca, N. Y.; Charles Thom, Storrs, Conn.; J. L. Todd, Montreal, Canada.

As the fields of the physician, veterinarian, sanitarian, and agriculturist all border on each other, and merge into each other in some instances, it can be readily seen how the subjects treated in this work are of equal importance to each of them; vitally important in fact, to *all* of them; and we predict the necessity for a second edition in the very near future, as the demand for this work must of necessity be very great.

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### STEDMAN'S MEDICAL DICTIONARY.

STEDMAN'S MEDICAL DICTIONARY, by Thomas Lathrop Stedman, A.M., M.D., Editor of Twentieth Century Practice of Medicine; Editor of the *Medical Record*. Octavo of 1,000 pages, with 250 illustrations. New York, William Wood and Company, 1911.

This up-to-date medical dictionary comes to us from the pen of a busy physician; practitioner and editor; a man with a vast amount of experience in both fields, and consequently one well versed in both the practical and technical side of medicine. The work suggests at once broad-mindedness and conservatism. In short the product of a man well-grounded in the art and science of medicine. Realizing that medicine touches other sciences at so many points, the author has endeavored to include definitions of all chemical, botanical, dental and veterinary words, which a physician is likely to meet in reading; so that *Stedman's Medical Dictionary* is not only a rich field of education for both the physician and veterinarian as a work of reference in the usually accepted function of a dictionary, but makes an extremely interesting work for perusal and reading by those in search of scientific

knowledge. Special attention has been paid to the etymology of the words used in medicine, the author appreciating the fact that nothing aids so much in fixing a definition in one's memory as a knowledge of the formation of the term; therefore the chief sources of our language, Anglo-Saxon, Latin and Greek, and to a slight extent Arabic, have been indicated under the main titles and, where necessary under subtitles as well. And, while the author regrets the elimination of Greek in our schools, he nevertheless realizes that only a small percentage of even well educated physicians in the present age can read Greek characters; therefore in the case of Greek sources, he has given them Roman letters; which (although he explains that he yielded under protest), we believe is a very great advantage. The book is well illustrated, embraces 50,000 titles and has an appendix on weights and measures, including the comparative quantities expressed by the metric system and the United States apothecary system. The work is handsomely bound in flexible green leather covers with gold lettering, and is of inestimable value to veterinarians, physicians, dentists, in fact any one in pursuit of scientific knowledge.

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### VETERINARY DISSECTION GUIDE.

Professor Septimus Sisson, S.B., V.S., professor of comparative anatomy in the Ohio State University, and author of "*A Text-Book of Veterinary Anatomy*," has just issued a "*Veterinary Dissection Guide*"; part I. of which, has just come into our hands. This little guide was originally intended for the use of students in the College of Veterinary Medicine of the Ohio State University, where it was used in the form of mimeograph sheets, but has taken its present form in response to requests of several teachers in other institutions.

Part I. has 54 pages of instruction in dissecting and 56 blank pages interleaved between the reading matter for notes or sketches by the student as he pursues his dissection and studies. The instruction embraces the care of the part being dissected, instruments to be used, clothing to be worn in the dissecting room, the steps in dissecting each region, etc., etc. The book reads like an instructor on anatomy talking to a dissecting class, asking them questions as to what they have found in this region and that, and instructing them as to what they will find in other regions as they proceed. It has an advantage, however, over an

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instructor, in that it will never ask the question nor give the instruction until the moment that the student reaches the point where he is ready for the question or the instruction. It not only reduces the work of the instructor very materially, but just as materially enhances the student's ability to learn. No veterinary student should be without this "guide" if it is possible for him to procure one.

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GOVERNOR OSBORNE, of Michigan, has appointed Dr. J. E. Ward, of Perry, that state, a member of the state board of veterinary examiners. We congratulate the doctor, and feel sure that he will have only the interest of the good name of his profession at heart, in performing his duties in connection with the board.

HORSE JUDGES AND VETERINARIANS.—During the past season, judges in the horse rings at Western Canada's big exhibitions have had some experiences they will not forget for a while. Of course, judges do not expect smooth sailing where competition is keen. They realize that opinions differ, and that practically every exhibitor has a following who look upon a certain horse with prejudiced eyes.

There is one point, however, on which there should be no room for difference of opinion. That point is *soundness*. If the fair circuit of 1911 can be taken as a criterion, it is evident that at least some judges do not know what constitutes an unsoundness in draft horses. It is necessary only to call to mind that the individual was good enough to win first or second, both at Winnipeg and Brandon, and then was in the "also rans," the first when at Regina, and, again, at the top the second week with a different judge in charge, to prove this assertion. Either in one case or in three cases, the men entrusted with passing judgment on high-class animals made a mistake as to soundness.

It is just such happenings as these that lead us to remark that only competent veterinarians should be allowed to say whether or not an animal is unsound. Could it not be arranged that when judges have any suspicion of an unsoundness they can call in the official veterinarian of the exhibition association and have him settle the point. When a man exhibits a pure-bred horse, he does not want men who are not altogether qualified to pass opinion pronouncing the animal unsound—(*Farmer's Advocate, Winnipeg*).

## CORRESPONDENCE.

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PUBLICITY AS A SPUR TO THE VETERINARY COLLEGES TO PREPARE THEIR MEN TO PASS THE EXAMINATIONS OF THE STATE BOARDS OF VETERINARY EXAMINERS.

CHICAGO, November 8, 1911.

*To the Editors of the AMERICAN VETERINARY REVIEW :*

GENTLEMEN—The *Journal of the American Medical Association*, and similar papers in the medical profession, are accustomed to publish, from time to time, lists of the number of persons from each medical college who passed the examinations for license in each state in the Union, and the number who failed to pass. The names of the persons who passed or failed, of course, are not thus promiscuously published, as this would only be mortifying to those who failed and might unduly puff up, with the pride of the gaudy peacock or the noisy gander, those who passed. This custom has been productive of great good, for medical colleges have come to vie with one another to see which ones would get the most of their graduates to pass state board examinations, particularly the boards difficult to pass. The effect has been wholesome upon the colleges and the students, for the one strained every nerve to equip their students to pass any board, while the students strove to do credit to their alma mater. The published lists, in many instances, have been silent comments on the weakness or strength of the faculties of the colleges, or the unpreparedness of the graduates for professional life. The lists have been a goad to both good and bad colleges without being a curse to either. They have caused many a titter when colleges supposed to be good failed to get their students passed; at the same time the pain, secretly felt, was bracing in the highest degree.

Why should not this plan be followed by the secretaries of the State Veterinary Examining Boards? The medium for pub-

lication should be the AMERICAN VETERINARY REVIEW. The lists published should embrace the number from each college who passed each board in a given period of time. The list could appear in tabulated form something after the fashion of the list of meetings of veterinary associations in the country, or the tabulation of the main points in each state license law which occasionally appears in the AMERICAN VETERINARY REVIEW. Each secretary should be asked to furnish the number who passed and the number who failed from each college at the license examinations. The alphabetical arrangement by states and colleges would be best. The list should be truthful and complete as far as may be. The custom would soon become a fixed one. Secretaries would soon find it a moral obligation to furnish the data and it would be their bounden duty to do so. The list would be of great interest. Examining boards of all states, college faculties, all students who tried the examinations, and all who propose to try them in the future would be interested in the lists. The older graduates of all the colleges, older practitioners, hardened by the rough and tumble of their every-day work; professional men of all sorts, case-hardened by experience, would have an eye on the lists, knowing that they would be a gauge of the strength or weakness of the colleges. They would lend their interest, not to those that make-believe, but to those which turn out satisfactory workers in the professional field as shown by the facts.

D. ARTHUR HUGHES, Litt.M., Ph.D., D.V.M.

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CORSICANA, TEXAS.

*Editors AMERICAN VETERINARY REVIEW:*

The last legislature of Texas passed a law regulating the practice of veterinary surgery and dentistry and creating a board of examiners. The members of the board are T. W. Watson, president; F. G. Cook, secretary-treasurer; J. E. Wilkins, W. A. Knight, S. J. Swift, C. C. Parker and one yet to be appointed.

The board completed its first examinations recently in Dallas, when sixty-six graduates took the examination. Result not yet known, as the papers have not been graded. I enclose copy of act. I have received scores of very interesting communications since I assumed the duties of president of the board and enclose

one that I thought might interest you and some readers of the REVIEW.

We think the law, although not all we would desire, a very good one; in fact we are very proud of it. I am,

Very truly yours,

T. W. WATSON.

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“ TREATMENT BY MAIL.

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“ Two Diplomas and Sixteen Years Practical. Everyday Experience are back of my Guarantee.

—————, TEXAS, July 8, 1911.

Dr. T. W. WATSON, Corsicana, Texas:

Dear Sir not being personal aquanted will you but i am fixen to lay my case before you and Deal onest with you as when i started out to practic 17 years a go i started with Dr. ——— a veterinary surgeon and denest of 31 years Experience being successful in practic i later took a corse thru the male the Canady School in vet Science i ceured my bookes in the bank and rite for my examand nation they sent them i made a good grad and the sent me a Diploma. the 23 day of may in the year of our lord 1905.

T. H. HASKETT, Dr D. Sicy.

J. E. HODGINS V S V D. President.

later i tuck a nother corse from Dallas school an veterinary surgery and Dental got my Diploma June 6—a d—1908. Dr. Frank E Rutherford v s president Dr Roy w Rutherford vice pres R D Rutherford sec tras C E Baxter W S Barter

i allso tuck a coarse from the Detroit Vet Dental Coledge an special Dental work got diploma deposedet my bookes with philips the banker here at aubrey till the Examanation was made got Diploma and futhermore hav studyed Johnson and baker bookes who is the Dean of the Chicago vet colledge and take the liture all the time and keep posted up i hav bin wher i am 8 years

i hav bin successfull hav made friends all the while hav made all the operations a surgeon can me this year i hav cast 16 rignal All well i go for 2 hundard miles and treet sick animals all that is a ganst me is i never gragated in a up to dated vet school the people all think i am a first classed vet surgeon and denest i dont no of eney thur gragate in Denton Co i all so tuck Pro. berryes corce i hav a fine practic and hav 2 boyes i ame to send to a good vet coledge i send you some of my circlers if it is so i can get licens i want to be a up to date man as i over the per-feshion can i send in the fee of \$5.00 and cesure one ples let me no as soon as you can an every so much oblige i hav \$300 worth of inst ments and a big Practic mickin lots of money.

"Youres very truley,  
" \_\_\_\_\_ "

"P. S.—A word i can get 500 men of fine standard to sine eney Recomendation i should want an vet and surgery the non gragates here think i am a thur gragate an all the people do dont ame to let them no eney better if i can get licens i will a preshate them. now Doctor i hav a rite to practic under the law in this county but i want to not be bared. So if you ples do the best you can for me regardles of price you find stamp to ples dont take no Exceptions. Truly youres."

THE COLORADO STATE BOARD OF VETERINARY MEDICAL EXAMINERS will hold an examination for graduates of recognized colleges, at the State Capitol, January 5-6, 1912. Particulars may be obtained by addressing Dr. Wm. W. Yard, secretary, Denver, Colorado.

IMPORTANT NOTICE—ALPHA PSI FRATERNITY.—"All members of the Alpha Psi Fraternity, either honorary or graduate, who have made a change of address within the past year, as well as all graduate members for the year 1911, should forward their present address, with the line of veterinary work they are now pursuing, to the undersigned, secretary of the National Council, for publication in the *Alpha Psi Directory*, which goes to press January 1, 1912."

H. PRESTON HOSKINS, Secretary,  
University Farm, St. Anthony Park,  
St. Paul, Minn.

## SOCIETY MEETINGS

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### MISSOURI VALLEY VETERINARY ASSOCIATION.

The annual meeting was held at Omaha, July 10, 11 and 12, 1911.

Meeting called to order 1.55 p. m. by President Kaupp. Minutes as published in the AMERICAN VETERINARY REVIEW were accepted as published. President Kaupp then presented his address.

#### PRESIDENT KAUPP'S ADDRESS.

It is customary for the president to deliver an annual address at the termination of his tenure of office as president of the association. It is my opinion that this address should be delivered at the beginning of his tenure of office so that he could outline his policy for the ensuing year. To make this possible it would be necessary to so amend the constitution and by-laws that the officers be elected at the semi-annual meeting which would give the president six months in which to prepare his address. This would mean that he would be elected one year before he would preside instead of six months, as at the present time.

A brief review of the history of the association as well as the advancement made by veterinary science in the Middle West may be in order at this time.

The Missouri Valley Veterinary Association was organized in 1894. Its members at first consisted of a few veterinarians living in central western Missouri and eastern Kansas. According to the constitution and by-laws adopted at that time the association meetings were held quarterly. First in Kansas City, then in Leavenworth, and later, when the association fell largely into the hands of the United States meat inspection force of Kansas City, the veterinarians of St. Joseph were interested in the association and an occasional meeting was held in that city.

In the early days of the association the value of horses was 25 per cent. to 50 per cent. less than at the present time. The country was struggling from the effects of the panic of 1893. The

laymen looked at the veterinarian as one who could treat the ills of horses but knew little about diseases of cattle, dogs or other animals. With the improvement and increase in all kinds of live stock, and with the education of the laymen to the understanding of the advantage of employing men to treat their sick or injured animals, there has been given an impetus to veterinary education and the profession in the territory embraced by this association. Where twenty years ago scarcely one hundred veterinarians were located, now more than one thousand are making a livelihood. This association has had the support of these gradual increasing numbers and has prospered thereby. In 1903 it was decided to enlarge the scope of usefulness of the association, and accordingly a meeting was called for Omaha. The officers of the association were pleased with the attendance and so called a meeting annually for this city. In the following year the constitution and by-laws were revised so that now our meetings are and have for a number of years been held semi-annually. The following year the Iowa-Nebraska association was absorbed by the Missouri Valley Veterinary Association. The *Iowa-Nebraska Veterinary Bulletin* was also taken over and its name changed to that of the *Missouri Valley Veterinary Bulletin*.

This association should continue to grow and should be a power and assistance in veterinary sanitary measures worked for in the various state legislatures in its territory.

As to the advancement of comparative medicine, we can but be astounded when we consider that the first pathogenic germ was discovered about the year 1850, or about sixty years ago. That the microscope is of rather recent invention. That the germ theory has only been proven within the memory of all present, it is indeed wonderful, the progress that has been made in solving the hidden mysteries so important to those interested in veterinary science.

The fact that tuberculosis is due to the bacterium tuberculosis, was only made known by the discovery of that organism by Koch in 1882, and even after this was proven by special staining methods and animal inoculations, there were yet skeptics (not scientists) who preached that tuberculosis was not due to a germ. The disease was at first recognized by its clinical signs and post-mortem findings. Later, when it was proven to be due to this germ and the identity of the germ established, inoculations with laboratory animals as the Guinea pig added a new

hope to the correctness of diagnosis in cases considered doubtful. With the discovery of the chemic substances given off from the germs and the utilization of same under the name of tuberculin, new hopes as to a means of detection of the disease in animals which did not as yet show physical signs was found. This opened a new field and the anaphylactic reaction was made use of as a diagnostic agent; and later in other diseases with a like toxin, as in glanders. This phase has progressed until at the present time there are no less than five methods whereby we are assisted in making our diagnosis and proving the presence of tuberculosis and six means of arriving at a diagnosis in glanders. The diagnostic methods in brief in tuberculosis are: 1st, physical signs with autopsy; 2d, the subcutaneous test now in general use in detecting the disease in cattle and promises to be of, perhaps, equal value in the testing of hogs; 3d, the ophthalmic test used in some countries and particularly in the Argentine Republic; 4th, the cutaneous test used in the human; 5th, the recent intradermal test. Whether or not this latter method will supplant the subcutaneous tuberculin test remains to be seen.

Wonderful strides have been made in the diagnosis and eradication of glanders among horses. The discovery of the bacterium mallei and the proving of this organism as the causative agent proved the positive contagiousness of this disease. With the development as in tuberculosis we have no less than six methods unfolded to us as time has gone on. First came the diagnosis by clinical signs and autopsy, including microscopic study of lesions secured at autopsy. Second, came the discovery of the anaphylactic reaction following the introduction into the body of mallein. Third, the inoculation into the male Guinea pig and the production of orchitis with chancroid lesion. Fourth, the agglutination method following the discovery of the formation of a chemical substance in the blood called agglutigen, the formation of which is stimulated by the presence of another chemic substance called agglutinin and contained within the germ. When agglutinin of the germs unites with the agglutigen of the serum, clumping occurs (Widal reaction). Fifth, with the discovery of precipitinogen formation in the blood which substance was stimulated by precipitin contained in the products of the germ, there was another field of diagnosis opened. Konev was the first one to give a practical method of this knowledge. About this time we have unfolded to us the Wasserman reaction or, more properly speaking, the fixation of the complement in the diagnosis of glanders.

The discovery of the body defenses have not only been made use of as a means of diagnosis, but also as a means of bringing the body up to that state in which recovery must ensue.

The discovery of the antibodies, a serum solution of which we call, for convenience, antitoxin, gives us a therapeutic agent which enables us to preserve or save the lives of hundreds of thousands of animals which represent millions of dollars.

The recent discovery of the defensive chemic substance called by Wright and Douglas osonin, which substance prepares the pus-producing germs or sensitizes them so that the phagocytes can destroy larger numbers and thus hasten recovery, has opened up a new field in vaccine therapy.

It is only in recent years that the full significance of parasitism has been fully comprehended. It has been proven that many parasites, especially worms, give off poisonous chemic substances. Thus the fluid from the cysts of the larval stage of certain parasites are poisonous and even result fatally when injected into the body of an experimental animal. Uncinariosis, or hook-worm disease, as well as other forms of intestinal parasites especially belonging to the strongile family, not only cause constitutional disturbance by robbing the host of blood or nutrients but also by the chemic substances or poison given off from their bodies. These toxic products cause eosinophilia, in some conditions cause cloudy swelling and focal necrosis and death. The latter is well illustrated in the protozoon disease of turkeys called entero-hepatitis.

With improved methods in the laboratory, greater work is being done. Thus by the examination of the feces (in intestinal parasitism), both macroscopically and microscopically, correct and proper diagnosis and hence medication can be given.

The facts revealed by blood study is of inestimable value from the practical standpoint. So that the working out of practical laboratory methods has made necessary the adding of this important line of work to our college curriculum and development thus goes on. The man in the field, to be of most practical value to his patrons, must do some of this laboratory diagnosis work and hence provide himself with some equipment. The future man to succeed must do this.

Great strides have been made along other lines and must not be lost sight of in this hurried and brief review. Surgery has made wonderful progress, operations are successfully performed at the present time, many of which were not even thought of

fifty years ago, and others would have surely proven fatal to the patient. At the present day every well equipped hospital has an operating table, which is considered as essential a part of the equipment as casting harness, stocks, or slings. Was it so thirty years ago?

We have also made great strides in the lines of diagnosis and therapeutics. Recently an intra-tracheal spray has been successfully used and advocated by Dr. Levi. This instrument is provided with a trocar which is inserted between two tracheal rings after first making a skin incision. From 1/10 to 1/20 the dose per orum is given. Best results are claimed by administering oily solutions; next comes glycerinated, then alcoholic, and last, aqueous. The doctor recommends this form of medication strongly in diseases of the larynx, trachea, bronchi or lungs. It certainly deserves attention by our American veterinarians.

Another point worthy of mention recently brought out. Since recovery from disease is dependent on the rapidity of elimination of poison (toxin) which produce the cellular disturbance most dangerous to the parenchymatous or vital organs, it has been recommended to give quantities of physiological salt solution, which would have a tendency to flood or wash out more thoroughly the tissues, and certain to result in elimination of larger quantities of fluid from the body; hence it is argued would more quickly rid the body of offending chemic substances toxic to it. Among those diseases on which it is recommended are those of an infectious nature; and also pneumonia and purpura hemorrhagica. In this latter disease, the writer can testify to its being of great value, as one seldom dies with the use of physiological salt solution.

More is being learned about toxicology and toxic substances in plants. It would be worth the while for all veterinarians living in the Missouri Valley to secure from the State Board of Horticulture of Missouri the bulletin recently issued and written by L. H. Pammel. Among some of the interesting things noted are items in regard to toadstools, of which there are many varieties. The Fly Agaric is from three to five inches across, at first globose, later dumb-bell shaped. The top is covered with flocculent scales. The young plant, at first reddish later becomes orange and finally a yellowish. The stem is white or yellowish-white, pithy and hollow. This plant yields a poison, muscarin. The fungus is called *Amanita muscaria*. Another

variety is the *Amanita phalloides*. This fungus has a smooth, viscid pileus. It is usually white in color, occasionally assuming a brownish color. This fungus yields a deadly poison called phallin, which has different action than the classical muscarin. It is powerfully hemolytic for erythrocytes of the Guinea pig, fowl, pigeon, dog, goat and man. It is possible to immunize an animal by repeated small doses. Milk, either raw or cooked, is said to be an antidote?

Many varieties of poisonous ferns are found in the Missouri Valley. When ingested in large quantities they cause enteritis, spasms and paralysis. Many varieties of horse tail or equiseta are found. They may be incorporated in the hay and in large quantities produce paralysis of hindquarters, spasms and death. Warning is also given in regards to the much discussed Johnson grass and sorghum. The latter, especially when young and frosted following drought, etc. The offending substance is hydrocyanic acid contained in a glucocide known as dhurrin. Corn cockle, and particularly the seed, contains an active principle called saponin, which is poisonous. This substance is not only poisonous for animals but also for fowls. Among the symptoms noted are vertigo, nausea, tenesmus, diarrhoea and impaired locomotion. The aconite, larkspur, crow's foot are also well-known poisonous plants common in this region. The seeds of apples, peaches, pears, plums and cherries all contain a glucocide called amygdalin, which in the presence of the proper ferment is readily converted into hydrocyanic acid. The leaves and bark of the wild cherry are poisonous to cattle. Horses by gnawing and ingesting quantities of locust bark have become poisoned. The symptoms are as follows: stupor, defective vision, incoordination of movements, etc. Rattle-box, or *crotonia sagittalis*, is common and contains an active principle producing crotalism. This plant possesses a small, yellow, pea-like flower and an inflated pod. The young sprouts of buckeye along the river bottoms early in the springtime has caused great loss among cattle grazed on these fields before the grass was of sufficient growth. Not to be lost sight of, is the young cockle-burr, which when eaten by hogs results in death. There has recently been reported fatal poisoning in hogs eating the plants and roots of the cockle-burr, where the plant has just began to grow. So the work of investigation goes on.

Following the president's address the reports of secretary and treasurer, the Committee in Infectious Diseases, the Committee

on Surgery and the Committee on Food and Milk Inspection were presented. There has been a retrogression along the lines of enforcement of state laws in a number of states. Kansas City has directed that unpasteurized milk entering the city must be chilled to 50° F.; this adds materially to the food value and lessens the laboratory work of the inspection force. Committee on Certificate of Membership reported unfavorable. Instead it was recommended that a card be issued annually to those paid in advance. Motion carried.

It was recommended that in those states having stallion inspection, two outlines of a horse should be on each certificate where markings and unsoundnesses could be drawn. Photos to accompany questionable cases; same to be filed, making a permanent record; and that the fee for examinations be fixed at \$5 for each horse.

Resolution read regarding uniform degrees; amended, carried.

Dr. F. J. Trafton's report of a case read and discussed. Dr. S. H. Johnson reported a very similar case.

The following report of the Committee on Therapeutics was read by Dr. Bourne, and quite freely discussed:

#### REPORT OF COMMITTEE ON THERAPEUTICS.

Your Committee on Therapeutics for the year 1910 and 1911 have been at work making an effort to gather together material which has proven itself valuable in the hands of the veterinary practitioners of the United States and elsewhere. Your committee is unable to make a report altogether from personal observations, but where these materials from outside sources are submitted, it will be so stated.

Excellent results have been reported in the treatment of various skin diseases such as eczema, pruritis, etc., with epicarin. Epicarin is a basic, non-toxic, condensation product of cresotinic acid and betanaphthol. It occurs as a reddish yellow powder, odorless and tasteless, soluble in alcohol, ether and acetone, yielding from light to dark brown solutions according to concentration. It is miscible with petrolatum and lanolin. In the clinic at the Kansas City Veterinary College, the alcoholic solution is preferred, 5 per cent. to 10 per cent. being the strength usually employed. It is a valuable antiseptic, antipruritic and parasiticide, and deserves a more extensive use.

In the *Journal of the American Medical Association* of November 5, 1910, occurs an article on the comparative efficiency of some common germicides, by Drs. Post and Nicoll, wherein some exceedingly interesting facts are laid bare. Thus the relative value of the following silver preparations were ascertained, viz., argyrol, protargol, and silver nitrate.

Silver nitrate was found to be the most efficient germicide in this class, and even in solutions of 1 to 5000 it was found superior to either one of the others. It should be remembered, however, there silver nitrate coagulates albumen and precipitates chlorides which is not the case with argyrol and protargol. Of the mercurials it was found that the germicidal discs of Parke, Davis & Co., composed of biniodide of mercury, 1 part; potassium iodide, 1 part; sodium bicarbonate, 20 parts, dissolved in 1000 parts of water were apparently the most efficacious of any of the mercurials known, thus it was found that a 1 to 5000 was as efficacious as a 1 to 1000 mercurial chloride solution. It also has the advantage that it does not coagulate albumen and hence permits of a greater penetration than other mercurials. It causes less irritation and does not corrode instruments.

In the phenol group, tri-cresol, as well as kreso, in 1 per cent. solutions, destroys all ordinary organisms in less than one minute. Creolin is less effective, lysol still less and phenol least of all. A 5 per cent. solution of phenol, however, kills all ordinary organisms in about one minute.

Iodine solutions are remarkably effective, thus it was found that a solution composed of 1 part of iodine and 1 part of potassium iodide, 100 parts of water, destroys the streptococcus, pneumococcus and the bacillus typhosus in less than one minute. The writer has found tincture of iodine diluted with an equal volume of water to be the most dependable disinfectant for general use in all kinds of septic wounds. My usual method is to moisten a piece of gauze with this mixture and pack the infected wound with it. We have all placed more or less dependence on formaldehyde, but according to Drs. Post and Nicoll, who were conducting a test at the Rush Medical College, it is certainly not very dependable. In 1 per cent. solutions it requires from 30 minutes to one hour to destroy the streptococci, pneumococci and the bacillus typhosus and in the ordinary strength of 1 to 1000, it required several hours.

A 50 per cent. solution of alcohol is a thoroughly dependable disinfectant, and is especially convenient for skin disinfecting.

Tincture of green soap, according to the pharmacopœia, is composed of 650 grammes of *sapo mollis*, 20 c. c. oil of lavender alcohol sufficient to make 1000 c. c. This preparation destroys all ordinary germ life in less than two minutes. This has been verified by repeated experiments. For use in the hospital it may be kept in an ordinary bottle, with a squirt top, and will take the place of soap as well as that of a disinfectant. This preparation, of course, is primarily intended for skin disinfection, but may also be used on wounds. In this somewhat brief report, a few important facts may be gathered, namely: that disinfectants have evidently a selective action on certain micro-organisms, and that a disinfectant that is efficient in destroying one organism may be useless for destroying others. I shall aim to present to this association the report of my own labors in the choice of disinfectants in the near future.

Dionin—ethylmorphine hydrochloride occurs as a white, crystalline powder, having a faintly bitter taste, and is soluble in seven parts of water or 17 parts of alcohol. Dr. Hugh Miller, professor of ophthalmology at the Kansas City Veterinary College, is recommending a trial of this agent in the treatment of periodic ophthalmia, using it in 5 to 10 per cent. solutions, of which a few drops are to be instilled into the eye three times a day. This agent causes dilatation of the lymph spaces of the cornea and thus drains the intraocular contents, thereby relieving the intraocular tension. A severe œdema of the conjunctiva and lids of the eye does occur following its use, but this should not cause any alarm as it disappears in a short time after its use is discontinued, in fact this swelling is essential and will subside with benefit and not harm to the eye. He also states that it is a valuable antispasmodic and analgesic, not producing constipation nor nausea, hence this agent may be used in intestinal disorders where a non-constipating anodyne would be useful.

A great many practitioners with whom I have been speaking recently are very enthusiastic over the very rapid and beneficial results they receive from the use of the following treatment in acute laminitis, namely:

The administration of a capsule containing from three to four drams of acetanilid and injecting over the digital vessels ten to fifteen minims of adrenalin chloride solution. It should be remembered that acetanilid, like aconite, powerfully lowers blood pressure, increases heat radiation and is far superior to aconite as an agent to allay pain. The injection of the adrenalin

over the digital vessels diminishes the amount of blood in the parts involved and it is reported that it is nothing usual for a patient suffering from laminitis to be far on the way to recovery in a few hours. The usual additional treatment of evacuating the bowels and stimulating the secretions, of course, should not be overlooked.

Antitetanic serum came in for a good deal of discussion, both pro and con. Strychnine was reported as being given as a last resort and was thought to have helped the condition; animal being put in slings. The proposition of formaldehyde gas vaporized in tight quarters as not being good was questioned by S. Stewart. Different disinfecting agents for different purposes were recommended by A. T. Kinsley.

The question of the similarity between *infectious anemia* and so-called *bottom disease* as found along the Missouri River bottoms was discussed: the opinion seemed to be general that they are different conditions. Bottom disease is caused by the so-called "rattle weed" or *crotalaria*.

#### SECOND DAY.

Met at hotel and went in body to Council Bluffs, to Miller and Son's hospital, to see a case of dourine in a stallion, which had been shipped from Taylor County. Short talks were given by Dr. A. T. Kinsley and Dr. J. I. Gibson, State Veterinarian of Iowa, about dourine. This outbreak in Taylor County, Iowa, is somewhat different from those described in the text books; there being very little, if any, depigmentation in affected animals. A number have been killed and over 200 head are now in quarantine. The association is under obligations to Drs. J. I. Gibson, A. H. Quimm, Wm. Readhead and D. H. and G. G. Miller for this opportunity of seeing a case of dourine, the first time a case has been presented as clinic material, at any association meeting.

The fast Council Bluffs fire team was shown to the members while at "Miller's Hospital," and were very much admired by all; this team are the holders of the world's record for straight-away half-mile, hitched to fire apparatus.

Dr. C. L. Willhite not being present, his paper, "Pervious Urachus," was read by the secretary and a great deal of discussion resulted. V. Schaefer uses dilute  $H_2O_2$  and then boric acid solution. L. U. Shipley uses styptic collodion, A. T. Kinsley, tincture ferri chloride. J. A. De Cow, thinks the

condition partially due to constipation, and recommends oil and injections with pressure on urethra. G. M. Waalrod suggests  $H_2O_2$ , tincture ferri chloride and tincture iodine. A. F. Baldwin used a human catheter and a syringe to aspirate pus from the urethra, afterwards flushing. A. J. Treman opens freely, cures, applies styptics and biniodide blister. S. H. Johnson presses cord, flushes thoroughly with a weak plumbi acetate solution large amount; this passing to the bladder is thrown out with the urine. C. E. Stewart opens freely, cutting cord short, lets it bleed a few minutes, then puts  $\frac{1}{2}$  dram of potassium permanganate on oakum and holds on the open wound until it heats.

Dr. R. F. Bourne gave "Some notes on the Reproductive Processes in Animals," which brought out the latest thought along this line, and in relation thereto, a number of unusual cases of animals having one small dead foetus or calf and a full grown live one at the same time. Dr. Cline reported a case and wished a diagnosis. Stomatitis, removed cap of tooth and used boric acid solutions and later dilute tincture iodine. Temperature 104, pulse and respirations about normal, infection spread to outside lips. Antistreptococci serum brought temperature down to normal, but later rose and fell. Hind limbs swelled, cracked open at joints, nasal discharge, swelling spread over head and up legs; finally temperature 98, pulse very weak; down twelve hours before death.

Dr. E. L. Quitman in discussing Dr. Cline's case, suggested "mycotic lymphangitis," which he believes is an old disease, and that a great many cases of which were mistaken for farcy and killed. Suggested as treatment, arsenic 2 or 3 grains, copper sulphate 1 dram; dilute with stomachics two or three times daily.

The question of uniform certificates for inter-state shipment was brought up and a committee composed of A. T. Kinsley, J. I. Gibson, A. Bostrom, C. E. Stewart and P. Juckness was appointed to draft resolutions to be presented to the National Live Stock Sanitary Board, when next in session. J. I. Gibson was given the resolution and is to present it at the next meeting.

#### RESOLUTIONS.

Whereas, By a ruling of the United States Department of Agriculture all veterinary courses at the various veterinary colleges are similar and

Whereas, There are many different degrees, all purporting to show similar educational attainment, and

Whereas, This matter of deciding on a uniform degree will be brought up for consideration at the meetings of the Association of College Faculties and Examining Boards of North America, and the American Veterinary Medical Association (August 22-25, 1911), therefore be it

Resolved, That we, the Missouri Valley Veterinary Association assembled, representing the profession in the middle west, recommend to these associations the adoption of the degree Doctor of Veterinary Medicine, same to be abbreviated (D.V. M.).

Be It Further Resolved, That this association recommends that all colleges confer upon their graduates, who so desire, the newly adopted degree.

Election of officers resulted as follows: C. E. Stewart, of Chariton, Iowa, president; R. F. Bourne, Kansas City, Mo., first vice-president; J. A. De Cow, Holdredge, Neb., second vice-president; Hal C. Simpson, Denison, Iowa, secretary and treasurer.

Members of Executive Committee for ensuing year: Frank Jellen, Nebraska; D. O. Knisely, Kansas; A. J. Treman, Iowa; S. Stewart, Missouri, and B. F. Kaupp, Colorado. All of the officers were elected by acclamation.

V. J. Robinson reported a case of "Gangrene," This brought out considerable discussion and various ideas of treatment. The use of eserine for quick action of the bowels, extensive surgery and followed with hot water irrigations continued for at least half an hour at a time; afterwards free use of peroxide.

Prof. E. L. Quitman, of the Chicago Veterinary College, talked nearly two hours on "General Remarks on Veterinary Materia Medica and Therapeutics." This was one of the treats of the meeting and was listened to with much interest. It is unfortunate that an address of this kind was not taken down by a stenographer and later printed, where it could be read at leisure. A standing vote of thanks was tendered Dr. Quitman.

Dr. A. J. Treman reported a case of "Eversion of the Uterus." The discussion, as usual, showed there were many men of many minds. The advantages and disadvantages of suturing in these conditions, each had many adherents. Chloroform anesthesia, morphine and chloral hydrate were each highly lauded. A 1 to 2000 adrenalin chloride solution, a small amount injected into a number of places helps a great deal. Flushing with weak

antiseptic solutions seemed to be favored by a number; also rear elevation.

The following resolution was also passed: "Resolved, That any member of this association found guilty of issuing a certificate of health for animals not based on the legal requirements for such certificate in his state, shall be guilty of violation of the code of ethics and subject to expulsion from membership."

On calling the meeting to order the third day, the president was authorized to appoint three delegates to the A. V. M. A. meeting and three to the U. S. S. A..

To A. V. M. A.—A. T. Kinsley, S. H. Quinn and B. F. Kaupp.

To U. S. S. A.—S. H. Bauman, D. F. Luckey and Harry Morris.

The following named gentlemen were elected to membership: H. W. Marsh, Pawhuska, Okla.; Wm. Readhead, Lennox, Iowa; L. M. Walker, Decatur, Neb.; Frank C. McCurdy, St. Joe, Mo.; C. J. Norden, Nebraska City, Neb.; W. H. Spencer, Yates Center, Kans.; W. E. Norden, Shelby, Iowa; G. G. Miller, Council Bluffs, Iowa; Charles Parke, Merville, Iowa; E. G. Piper, Ida Grove, Iowa; George M. Walrod, Storm Lake, Iowa; B. F. Ward, Anthon, Iowa; H. R. Neihaus, McClelland, Iowa; G. Ed. Leech, Winona, Minn.; Wm. G. Keehn, Norfolk, Neb.; A. D. Glover, LaBelle, Mo.; J. W. Griffith, Cedar Rapids, Iowa; E. A. Shikles, Dearborn, Mo.; J. E. Ingmand, Red Oak, Iowa; Joseph Hughes, Chicago, Ill.; C. E. Hunt, Mt. Pleasant, Iowa; N. J. Deiling, Dallas Center, Iowa; S. E. Cosford, Rapid City, South Dakota, and A. Bostrom, Lincoln, Neb.

A large number were in attendance from nearly every state in our territory. The semi-annual meeting will be held at Kansas City, during the winter.

#### REPORT OF THE COMMITTEE ON NECROLOGY.

Whereas, The hand of disease has removed from us an active, progressive and honored member, Dr. R. R. Hammond, of Cherokee, Iowa, on April 26, 1911, be it

Resolved, That this association mourns the untimely death of an esteemed member, and directs the secretary to record this preamble and resolution in the minutes of the meeting and that a copy be sent to his family.

Whereas, Through being thrown from an automobile on July 4, 1911, Dr. Hiram A. Reagor, of Beaver City, Neb., was instantly killed, be it

Resolved, That this association is shocked by his sudden and accidental death, and expresses its sympathy to his young wife and his relatives, and be it further

Resolved, That a permanent record be made of this resolution and a copy be sent to his widow.

S. STEWART,           Committee on Necrology.  
V. SCHAFFER,

HAL. C. SIMPSON, Secretary-Treasurer.

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## REVISED VETERINARY ASSOCIATION OF KENTUCKY.

The Kentucky Veterinary Medical Association held its first meeting at Louisville, Kentucky, October 7, 1911, after a dormancy of three years, with headquarters at the Galt House; Dr. A. D. Piatt, former secretary, having moved from the state left no successor to take on his duties. The veterinarians of the state, realizing the good derived from such meetings, made it necessary for the State Veterinarian, Dr. F. T. Eisenman, to appoint an acting secretary. Dr. E. Norton Tierney, of Shelbyville, was selected to take up the work of Dr. Piatt, and notify the old members of the coming meeting, as well as inviting all eligible candidates in the state to the association. This he did in a creditable manner, and notwithstanding the attraction of the famous "Lexington Trots," on the morning of October 7, 1911, the veterinarians from all over the state began to assemble.

At nine o'clock sharp, Dr. F. T. Eisenman called the meeting to order, and outlined the business to be taken up by the association, as follows:

1. Election of officers.
2. Report of committee on legislation.
3. Revision of constitution.
4. Revision of by-laws.
5. Consideration of applications.

The following officers were elected for the ensuing year:

Dr. F. T. Eisenman, Louisville, Ky., President.

Dr. S. F. Musselman, Cynthiana, Ky., First Vice-President.

Dr. J. W. Jameson, Paris, Ky., Second Vice-President.

Dr. Robert Graham, Lexington, Ky., Secretary and Treasurer.

A committee appointed on the "*Act to Regulate the Practice of Veterinary Medicine, Surgery and Dentistry in the State of*



KENTUCKY VETERINARY MEDICAL ASSOCIATION, OCTOBER 7, 1911, LOUISVILLE, KENTUCKY.  
Drs. Black, Bueter, Pontius, Musselman, Calldemeyer, Redie, Barnes, Robinson, Eisenman, Crissler, Casey, Teirney and others.

*Kentucky, to Establish a State Board of Veterinary Medical Examiners, and to Punish Persons Violating the Provisions Thereof,*" composed of Drs. Musselman, Casey, Riede, Barnes, Breck, and Bueter, was then submitted, being read by Dr. C. Calldemeier, which was approved by the association. After being approved, it was decided to supply two copies or as many as was needed by the members of the association to interest the members of the legislature of their respective districts.

The Committee on Constitution and By-Laws, consisting of Drs. Miller, Black, Crissler, Stamper, Robinson, Smock and Ditto then made their report as read by Dr. E. Norton Tierney, followed by a motion that every member of the Kentucky Veterinary Medical Association should be supplied with a copy as read.

The following applications, accompanied by fees, were then placed before the meeting, thirty-two in number:

H. C. Black, Walton; T. L. Breck, Carrolton; E. Calldemeier, 2121 W. Broadway, Louisville; Robert F. Fisher, Paducah; Robert Graham, Experiment Station, Lexington; H. H. Hobbs, Kevil; C. F. Hobbs, Lebanon; R. P. Moody, Maysville; Geo. W. Pedigo, Glasgow; Frank H. Riester, 513 E. Market St., Louisville; Wm. F. Reide, 565 Garden St., Louisville; C. W. Southerland, Mayfield; F. E. Tibbols, Somerset; Jas. A. Wallace, Bowling Green; O. S. Cresler, Burlington; W. B. Robinson, Mt. Sterling; E. Norton Tierney, Shelbyville; Jas. Campbell, Henderson; John J. Gough, Benton; R. L. Pontius, Lancaster; David M. Stamper, Ewing; J. K. Ditto, Pleasureville; R. B. Smoot, Madisonville; Allan S. Barnes, Dayton; Maurice E. Jones, Campbellsville; F. A. Simpson, Milfurn; C. A. Miller, Louisville; I. M. Hendrich, Owensboro; John E. Gray, Bowling Green; John T. Chawk, 713-715 Seventh St., Louisville; E. C. Reaves, Glasgow; and John C. Meyer, 21 E. Pike St., Covington.

Twenty-four of these were passed upon by the association before adjournment for lunch at 2 p. m. The remainder will be taken up at the next meeting.

In the afternoon, at the Churchill Downs, the "Four-Mile Endurance Race," the biggest race of the year, was attended and enjoyed by all. It, however, was noted that none of the members were obliged to call for the assistance of a taxi to carry them and their winnings back to the hotel.

At 7 o'clock the banquet was spread in the private dining room of the Galt House, with Dr. F. T. Eisenman presiding. No formal program was in order. The toastmaster called here

and there on those seated about the board as the spirit moved him. Later in the evening the talk drifted into a general discussion of subjects pertinent to the profession, the following being of especial interest: (1) "Tuberculosis and the Tuberculin Test," by Drs. F. T. Eisenman and W. E. A. Wyman. (2) "Infectious Abortion," by Drs. Purdy, Casey, Wyman and Eiseman. (3) "Glanders and Reliability of the Mallein Test," by Dr. S. F. Musselman, whose experience in the Philippines with glanders made it especially interesting and instructive. (4) "Fistulous Withers, Bacterine Treatment," by Drs. Casey and Robinson. (5) "Hog Cholera and Its Serum Preventive Treatment," by Drs. Graham, Wyman, Casey and Deets.

These subjects were freely discussed by all the members in an informal way, and much good was derived from the talk about the table.

The meeting was adjourned at a very late hour, all voting the time well spent and the meeting a decided success, vowing with a final toast to work for a greater state association, with the assurance of their presence at the next meeting.

ROBERT GRAHAM, Secretary and Treasurer.

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## MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held in the Alderman's room, City Hall, Waterville, October 12, 1911. The meeting was called to order by President Wescott. Members present answering roll call were: Drs. A. Joly, I. L. Salley, A. L. Murch, C. F. Wescott, W. S. Lord, C. H. McGillicuddy, H. L. Stevens, E. E. Russell, C. W. Watson, W. H. Lynch, H. B. Ferris and B. L. Pratt. The minutes of the July meeting were read and approved.

It was resolved that this association should record its feeling of grief at the loss of our member and associate, the late Dr. F. E. Freeman, and that these resolutions be spread upon the records of this association. A committee of three was chosen to draw up the resolutions.

### RESOLUTIONS.

Whereas, The Divine Master has called from us Dr. F. E. Freeman, an active and highly esteemed member of this association,

Resolved, That we are profoundly impressed with a deep sense of bereavement at the loss of our friend and associate, and hereby tender to the members of his stricken family our heartfelt sympathy in their great affliction.

Resolved, That these resolutions be spread upon the records of this association, that a copy be presented to his family, and that they be published in the AMERICAN VETERINARY REVIEW.

Signed by

COMMITTEE.

A certificate, which was signed by the president and executive committee, was issued to one new member, Dr. B. L. Pratt.

The president, Dr. Wescott, was present at the meeting of the American Veterinary Medical Association, held in Toronto, Canada, August, 1911. Dr. Wescott gave us a general idea of the meeting, touching on each of its branches.

A vote of thanks was extended to Dr. Wescott for this report.

Dr. Joly gave us a very interesting report on a carload of horses that he had just mallein-tested. This was an able paper and was followed by a long discussion; the general idea of all, being that these horses should have a physical examination as well as the mallein test.

Dr. Salley was appointed on the executive committee, to take the place of the late Dr. F. E. Freeman.

Voted to meet at Portland, West End Hotel, January, 1912.  
Meeting adjourned at 12 o'clock midnight.

C. W. WATSON, Secretary.

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#### ANNUAL MEETING OF THE COLORADO STATE VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the Colorado State Veterinary Medical Association will be held in Denver, January 18 and 19, 1912. The program will extend over a period of two days and will consist of a pathological exhibit the forenoon of the first day, which will be in connection with the meat inspection exhibit, provided for the meat inspection class of the Division of Veterinary Science, State College. The afternoon of the first day and the forenoon of the second day will be devoted to business meetings and papers. The afternoon of the second day will be devoted to

a clinic which promises to be very interesting. The annual banquet will be held the evening of the first day.

This meeting, coming the week of the Stock Show in Denver, will add considerable to the attraction and profitable interest.

All veterinarians are urged to attend.

B. F. KAUPP, Secretary.

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### SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE.

On Friday, November 3, 1911, Dr. J. F. Devine gave a short address before the society upon "Suggestions for a Successful Practitioner." He spoke in a very easy and pleasing manner and brought out quite clearly that for the successful practitioner in veterinary medicine persistent application, honesty, and professional dignity are the three most necessary requirements.

The society met for a short business session on Friday, November 10, at which Mr. C. A. Gardner was selected to represent the Veterinary College at the Cornell-Pennsylvania football game at Philadelphia on Thanksgiving Day.

R. RAY BOLTON, Corresponding Secretary.

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DR. F. R. COMBER has been appointed assistant state veterinarian in Wisconsin. Dr. Comber is a graduate of the Connecticut Agricultural College and of the Chicago Veterinary College. We extend to him our congratulations.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION—The fifteenth annual meeting of this association will be held at Hotel Sherman, Chicago, December 5 and 6, 1911. The association includes all leading federal and state live stock sanitary officials. It has done good work in securing uniformity in state live stock sanitary laws and quarantine regulations. The 1910 meeting was the best attended and most successful in the history of the association. Already indications point to a larger attendance and better program at this year's meeting. All state veterinarians, members of live stock sanitary boards and officials interested in federal, state or municipal live stock sanitary control work are cordially invited to attend. Particulars can be had of secretary, J. J. Ferguson, Union Stock Yards, Chicago.

## NEWS AND ITEMS.

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### RULES AND REGULATIONS FOR THE IMPORTATION OF CATTLE INTO CONNECTICUT, IN EFFECT ON AND AFTER NOVEMBER 1, 1911.

1. All neat cattle, over six months of age, brought into this state, must be reported by the owner or his agent in writing to the commissioner on domestic animals, State Capitol, Hartford, Conn., within twenty-four hours after their arrival at destination and held in quarantine till, in case they are brought in by a person having a certificate of their healthy condition from the authority having jurisdiction of the diseases of domestic animals in the state from which the cattle are brought, identified and released, or, if not so brought in, until they have been examined by the commissioner or his agent.

2. All neat cattle, over six months of age, brought into this state must be accompanied by a certificate of good health, signed or approved by the authority having jurisdiction of the diseases of domestic animals in the state from which such cattle are brought, or a permit from the commissioner on domestic animals and such certificate or permit, when cattle are shipped, should be attached to the bill of lading of the transportation company.

3. A tuberculin test chart, properly filled out and certified to by a veterinarian in any other state and approved by the authority having jurisdiction of the diseases of domestic animals in that state, will be recognized and accepted as a certificate of health in the meaning of the statute.

4. When neat cattle are brought into this state under certificate of health as described above, the certificate must contain either a description of each animal including age, breed, sex and color or ear tag numbers, so that the cattle can be easily identified by the commissioner or his agent after their arrival in this state.

5. All neat cattle brought into this state accompanied by a permit from the commissioner on domestic animals must be held

in quarantine at the place designated in the permit until they have been examined and released by the commissioner or his agent. Such cattle, if intended for dairy or breeding purposes, will be given a physical examination and the tuberculin test by a veterinarian authorized by the commissioner, at the expense and risk of the owner. Cattle found upon such examination to be diseased will be condemned and destroyed without remuneration to the owner or slaughtered under proper inspection. Any tuberculin test of such cattle while in quarantine, made by any veterinarian or any other person not authorized by the commissioner to make such test, will be interpreted as "plugging" in the meaning of Sec. 6, Chapter 156, Public Acts of 1911.

6. Permits will be given to bring neat cattle into this state for exhibition at agricultural fairs when such cattle are to be taken out of the state immediately after the exhibition, unless the commissioner has reason to believe said cattle are affected with a contagious disease or are in an unhealthy condition.

7. Persons desiring to pasture neat cattle out of the state may furnish the commissioner with a list and description of such cattle including ear tag numbers to be kept on file for the purpose of identification, which will allow them to be returned within six months upon notification to the commissioner when they are returned.

8. Permits will be given to bring neat cattle into the state for a specified time and place for pasture, provided such cattle are marked with tags furnished by the commissioner. At the expiration of the permit the cattle must be taken out of the state or tested with tuberculin.

9. Sec. 6, Public Acts, 1911, provides the following penalty:

Any person who shall intentionally hinder the commissioner on domestic animals, or his agent, in the performance of any examination provided for by this act, or who shall attempt to defeat the objects of the tuberculin test applied to cattle by a previous injection of tuberculin known as "plugging," or shall in any way attempt to prevent an accurate result of such test, shall be fined not more than one hundred dollars, or imprisoned not more than thirty days.

10. All requests for permits or for further information should be addressed to Commissioner on Domestic Animals, Hartford, Conn.

H. O. AVERILL,

Commissioner on Domestic Animals.

## A PAGE OF COMPLIMENTS.

DR. ANSON W. BIGGS, of Amarillo, Texas, writes: "Thank you for sending statement as *I don't wish to miss a copy.*"

DR. J. F. THOMSEN, of Gladbrook, Iowa, says: "Enclosed find draft of \$3 for 1911 subscription of your journal, *the best in the land.*"

DR. R. L. RHEA, of San Antonio, Texas, writes: "I do not feel as though my month's work is complete without having perused the REVIEW."

DR. F. E. ANDERSON, FINDLAY, Ohio, in renewing his subscription, says: "I appreciate your efforts more each year as this is my twenty-fifth year in practice."

DR. WHIG DUNAWAY, of Dickinson, N. D., in renewing his subscription to the REVIEW, says: "Please renew my subscription to *the best veterinary journal published.*"

DR. A. E. LAMBERT, New Windsor, Md., says: "Whatever you do, *do not let my subscription expire.* I am an old subscriber and will notify you when I do not want it any more."

DR. P. W. MILLER, of Marysville, Ohio, in renewing his subscription, says: "I feel that all practitioners and every second-year student in veterinary medicine should subscribe for the AMERICAN VETERINARY REVIEW."

DR. W. G. GREGORY, of Ft. Worth, Texas, writes: "Enclosed herewith you will find check covering my subscription to the AMERICAN VETERINARY REVIEW. I am more than glad to say that it is worth many times what it costs, and the only way that I will be without it is for you people to stop its print."

THE following from Dr. G. W. Butler, Lafayette, Ind.: "I herewith enclose check for \$3 as renewal of my subscription to the REVIEW. I have been taking the REVIEW for twenty-seven years and have every number of each volume during that time. It is an old friend and highly valued instructor that I would not like to give up or part with."

# AMERICAN VETERINARY REVIEW.

JANUARY, 1912.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, November 15, 1911.

ANAPHYLAXY AND PARTURIENT FEVER.—In three numbers of the *Annales de Belgique* of the beginning of the year, Mr. Ch. Van Goidsenhoven, Adjunct Professor to the Veterinary School of Bruxelles, has considered the relations that may exist between these two morbid manifestations, which are here condensed.

At first he concisely passed a review of the various theories advanced to explain the etiology of vitulary fever, and then considers that the theory of intoxication is the one which seems to be most generally admitted. Although it fails in explaining the real cause of the disease, and Schmidt's treatment itself, with its so precious applications, has not thrown any light on this pathogenic problem.

Following this the author considers the theory of anaphylaxy and shows its advantages. First he shows that bovines may become anaphylactic, as proved by Alexandresco and A. Cirra in their application of anti-anthrax sero-vaccination. He inquires, in the production of vitulary fever, what may be the anaphylactogenous element.

If parturient fever is certainly related to parturition it cannot be in an inseparable manner, taking into consideration the cases which are observed unconnected with parturition. It is not the same as far as lactation, which remains the condition *sine qua non* of the production of the disease, and is never observed outside the period of activity of the mammæ.

Normal milk contains a compound which is possessed of anaphylactogenous properties, a power which has so far been only granted to albumines. Of the three albumines that milk contains, caseine alone differs from the circulating albumine. It then acts, towards the individual from which it comes, as a foreign albumine and consequently may have anaphylactogenous properties.

Sensibilization takes place during lactation and consists in the resorption of a certain quantity of milk through the udder. In his researches upon lactosuria, Mr. Porcher has shown that it was only necessary to disturb slightly the elimination of milk in females during the period of activity of the udder to see lactose appear in the urine. Mr. Van Goidsenhoven, by his personal experiments and those of Michoelis and Roma, shows that caseine also is resorbed during lactation and thus sensibilization is realized. This autosensibilization will be so much more efficacious that it takes place in a better milker, able to resorb a greater amount of milk by the udder. To sustain this theory he relates the fact that frequently three weeks or one month before parturition, artificial drying of cows is resorted to with animals in which a good secretion of the gland for the following parturition is to be preserved. This drying is one of the best means to realize the mammary resorption.

How does the reinjection occur? Porcher and Leblanc have shown that pregnant females some days before parturition manifest a state of lactosuria which reaches its maximum the day of delivery. This lactosuria necessitates through the udder at that same time, the resorption of a certain quantity of milk sugar. Mr. Von Goidsenhoven thinks that the caseine must be likewise resorbed, but that if it does not appear in the urine, it

is because it unites with the antibodies produced by the caseine, resorbed when the sensibilization occurs. The autosensibilization is thus followed by an auto-reinjection. But the resorption related to parturition gains only the value of an auto-reinjection when it involves a sufficiently large quantity of milk, as the reinjection requires doses a thousand times greater than sensibilization does. That is why only good milkers are susceptible to contract parturient fever.

\* \* \*

Is there a preanaphylactic stage? Vitulary fever affects in preference good milking cows whose secretion stops a certain time before calving. Between the first resorption of milk-producing sensibilization and the second resorption preceding the reinjection, there is a lapse of time passing of some three weeks which is really a true preanaphylactic stage. By the sensibilization there develops in the organism a specific antibody, which at the time of the reinjection unites with the new quantity of caseine introduced. This union allows the alexine to attack the caseine and gives rise to products of toxic disintegration. The theory of anaphylaxy is, then, related to that of intoxication and precisely its mechanism.

The author shows then that the theory of anaphylaxy explains why cases of vitulary fever are rarely observed in primiparas, while it allows an interpretation of those which occur, and again it explains the cases observed before parturition or beyond this under the influence of rich or of heavy feeding.

The symptoms of parturient apoplexy resemble those of anaphylaxy. They indicate an alteration of the nervous centres, began by a state of more or less marked excitement, followed by one of lasting and severe depression.

The lesions in both diseases are insignificant (congestion, hæmorrhages, infiltrations of some organs, repletion of abdominal visceral blood vessels).

The efficacy of the injection of air in the udder as in the treatment of Schmidt is explained by two factors: (1) the quan-

tity of air introduced compresses the mammary cells and arrests the resorption of caseine; (2) it raises the arterial tension by controlling the vasomotor troubles, which are the most alarming expressions of this syndrome.

Mr. Van Goidsenhoven then shows that the prophylactic means used up to this day may find the explanation of their action in the theory of anaphylaxy and principally venesection a few days before delivery as removing from the body a certain quantity of the anaphylactic antibody collected in the blood.

Every time hypersensibility by caseine will be suspected in a milch cow advanced in pregnancy it will be indicated to make repeated small subcutaneous injections of milk before the calving. A mode of prophylaxy upon which experience alone will decide.

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ENTRANCE OF AIR IN VEINS.—Resuming in the *Revue Generale* the work of Prof. Richter, of Dresden, after giving a historical sketch of the question, a concise review of the experiments that were made by many pathologists, physiologists and practitioners, with also a consideration of the symptoms and various theories advanced, the principal conclusions of the studies carried out by Prof. Richter in the *Archiv für Wissenschaftliche und praktische Tierheilkunde* are resumed as follows:

1. It is demonstrated that death can follow the artificial introduction of air in the veins of animals.

2. There are numerous observations published showing that serious accidents and death are due to the accidental entrance of air in an open vein.

3. Spontaneous entrance of air takes place, almost without exception, where there exists in the veins a negative pressure.

4. In most cases, accidents due to an aerial embolus are pathognomonic.

5. A gurgling noise is heard first, due to the entrance of the air, and then a cardiac sound.

6. The systolic cardiac sound is stronger than the diastolic, and this last is more appreciable in horses.

7. The cardiac murmur becomes weaker and disappears after twenty minutes at the latest.

8. In some cases there is noticed in horses an increase in the zone of the cardiac dullness.

9. The pulse presents qualitative and quantitative alterations.

10. Dyspnoea is consecutive to the cerebral anæmia.

11. Muscular twitchings begin in the muscles of the chest and afterwards extend to those of the extremities.

12. In horses, perspiration begins at the shoulder, then to the neck, round the anus and sexual organs, internal face of the thighs and the croup.

13. The evolution of the attack is acute and death takes place rather in the first half hour; in very acute cases, due to the introduction of great quantity of air, death occurs after ten minutes at the most.

14. In this case a favorable change is possible.

15. Thermic fluctuations up to one degree may be produced by intravenous injections of air.

16. Half of the dogs stand without difficulty the injections of 20 c.c., but that is a "dangerous limit."

17. The danger increases with the greater quantity of air.

18. Quarter of a litre of air introduced kills dogs certainly.

19. Horses may receive 1000 c.c. with impunity.

20. Eight litres is the lethal dose of horses.

21. The cause of death is embolus of the pulmonary artery; there is cerebral anæmia and death by asphyxia.

22. The theory of "death by the heart" is to be abandoned, as the organ beats still after death. In rabbits the right auricle contracts seven hours after death.

23. The air contained in the heart excites the contractions.

24. In rabbits and dogs, the air reaches only in very small quantities the left heart, through the pulmonary capillaries; on the contrary, in horses, it enters in large quantity.

25. The possibility of an embolus of the arteries of the brain or of the heart, by the emulsion of the blood, is admissible; but this form of death by the brain or by the heart is very rare.

26. Clinical and anatomical observations speak against the theory of death by the brain.

27. Lungs are the natural protectors of the organism against the danger of the introduction of air.

28. Prophylaxy is very important, as little can be expected of the treatment against the gaseous embolus.

\* \* \*

PERISTALTIC HORMON.—The generic name of *hormons* has been given by Starling to chemical bodies which take their origin in the cells of certain organs and which, transported some distance by the circulation, go to produce an effect of activation upon other organs; which takes place without the interference of the nervous system.

*Peristaltic hormon* has been discovered in 1908 by Zuelzer, Dohrn and Marzer. They observed that extracts prepared with the mucous membranes of the stomach and of the superior portion of the duodenum, taken at the time of full digestive activity, would give rise to energetic peristaltic contractions of the intestines, when they were injected in the blood circulation. They, besides, observed also that this same peristaltic hormon is found in great quantity in the spleen. They admit then that this substance is elaborated in the cells of the gastro-duodenal mucous membrane and is stored up in the spleen. This is merely a supposition. But what is a fact is that the extracts of the gastric mucus and of the spleen have a truly specific action upon the contractibility of the intestine. Practically, it is with the spleen that it is easiest to prepare aseptically this active substance, which is sold under the name of *hormonal*.

The *physiological effects* are very positive. In man, the effect upon the peristaltism began to appear between fifteen and thirty minutes after the intravenous injection or between two and four hours after the intramuscular injection. The manifestations noticed on laboratory animals are more positive, as they show that really the action of hormonal is almost instantaneous and

that strong intestinal contractions take place a few seconds after the injection being thrown in a vein.

The contractions promoted by hormonal are *true peristaltic waves, beginning at the duodenum and gradually progressing to the rectum*, and resulting in the expulsion of gases and feces. There is then an absolute opposition with the results obtained by the injection of physostigmine, which produces a localized, fixed and lasting contraction, a true tetanization of the segment of the intestine and which consequently is without beneficial effect, upon the progression of the intestinal contents.

This hormonal, which shows itself so specifically active, has been tried clinically in two orders of very distinct affections, in chronic constipation and in acute paralysis of the intestines.

The technic of the injections is very simple. Hormonal is sold in vials of 20 cubic centimetres, which represent the normal dose for a human patient. This dose can be increased without inconvenience, when the normal has proved insufficient or when the case is pressing; 30 and 40 cubic centimetres are frequently used by Zuelzer. The injection can be renewed at short intervals—no phenomena of anaphylaxy have ever been observed. The injection can be made in the gluteal region or in a superficial vein. This last is more rapid in its effects and less painful.

The accidents are of very little importance. Sometimes a little febrile reaction takes place. It soon falls off.

The only real, serious objection to the use of hormonal is that if it has in the majority of cases a peristaltic influence, most marked, and most energetic, there are a certain number of individuals which are entirely refractory to it. This peculiarity has also been observed in animals of experiment as well as in man. But as its use is harmless and without danger, it can be resorted to in all intestinal paralyzes which are rebellious to ordinary means.

These remarks, which I have taken from the *Presse Medicale*, will be of interest to veterinarians. If the effects of hormonal can be manifested in our large animals as rapidly as they do in

the human, it is certain that the life of many valuable horses subject to chronic constipation may be saved. Hormonal will certainly then become *the* mode of treatment of those difficulties. The subject may not be exactly to the point yet, but it certainly deserves notice and calls for experimentation at the hands of our practitioners.

\* \* \*

PELVIC ANGUSTY AND DISTOKIA IN BOVINES.—In the *Annales de Bruxelles* there have appeared, in a series of numbers, articles from the pen of Mr. E. Deghilage, entitled "*Congenital narrowness of the anterior pelvic strait, considered as a cause of distokia and its relations with the external conformation in bovines.*"

One of the most frequent causes of distokia is the narrowness of the pelvis. This pelvic angusty is very seldom due to the causes named by writers; fractures, rachitic deformities, tumors, etc. In most cases, and particularly in improved breeds, this cause is due to a congenital malformation of the anterior strait, which is so much more common that breeders prefer more and more animals affected with this anomaly and keep them for breeding.

From numerous observations Deghilage is brought to the conclusion that this conformation is due to a rotatory motion of the ossæ innominata round a point situated below the coxofemoral joint. This motion takes place in such a manner that both pubis are squeezed against each other and there results a raising of the anterior part of the pelvic floor, which one will detect by vaginal examination; at the same time the two ischiums spread apart and more or less enlarge the ischial arch. Besides this, the external angle of the ilium is drawn downwards and often forwards, while the internal rises and deviates apart from that of the opposite side. One can readily understand that these rotatory and twisting motions, combined, will have for result the widening of the posterior straight with the narrowing of the anterior. From which results a double inconvenience: first, the

fœtus passes with difficulty the anterior strait thus contracted, especially if it has inherited the maternal conformation, as is often the case; and second, the abnormal width of the posterior strait may be the cause of laceration of the vaginal and vulval walls at the time of parturition, as they are then no longer supported by the bony surroundings.

This modification of the pelvis has for result a special conformation of the croup which is known as *giantism of the hind quarter*, which may vary according to the motion of displacement executed by the *ossæ innominata*.

\* \* \*

If the displacement has been in a transversal direction, one will observe the flatness of the hips, the division of the croup by a groove sometimes very apparent in front, and the exaggerated separation between the ischial tuberosities. In its whole appearance, the croup has a trapezoid shape, with its posterior base wide, and at the same time the gluteal region seems to have lost its muscle and the rump has grown bigger.

If, on the contrary, the rotatory motion has taken place in the longitudinal direction, the croup is long, horizontal, and resembles somewhat *that* of a thoroughbred horse.

Finally, and that is the most frequent in females kept for breeding, there may be a combination of both motions; it is then the *mixed giantism*. The croup then resembles that of a heavy draught horse, the tail is attached high, and the croup is incurved backwards. Females which have this conformation have thick skin, hair long and coarse, small udder, and the yellowish coloration of the skin, characteristic of good milkers, is not present. Heredity is the most important factor in this anomaly.

The intervention of the veterinarian in cases of distokia due to this will consist in trying to draw alternatively the two shoulders and then the two coxo-femoral joints. If unsuccessful, he will perform embryotomy. But the serious nature of this inter-

ference shows how important it is to reject for breeding purposes all females having such conformation.

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ROARING AND ITS SURGICAL TREATMENT.—The *Veterinary Journal* for October brings out two papers which were read before the AMERICAN VETERINARY MEDICAL ASSOCIATION at the Toronto meeting. One by Prof. Williams on his operation, and the other by Prof. Hobday on the same subject. Both of these are already familiar to our readers; they have heard them in Toronto.

But in the same number of our contemporary there is also an article from Prof. J. J. O'Connor, M.R.C.V.S., which is very interesting, as it gives the record of ten cases of roarers which were treated by excision of the laryngeal ventricle, with the results following the operation. With No. 1 carrying a tracheotomy tube at the time of the operation, the left arytenoid was seen completely paralyzed. The left ventricle was only stripped. *Results:* Stenosis of the trachea occurred when tracheotomy had been performed, causing dyspnoea, and the horse was destroyed. No. 2, a complete success. No. 3, successful. No. 4, not improved two months after the operation. No. 5, became incurably lame and not tried. No. 6, operated on both ventricles; not improved after two months. No. 7, reported making still a hissing noise but not the sharp whistling of before the operation. No. 8, most successful. No. 9, five months after the operation, is no better. No. 10, both ventricles removed, not yet tried.

From the results thus obtained, Prof. J. J. O'Connor says that the conclusion he has come to is "that when the arytenoid is undoubtedly paralyzed, the operation is likely to be successful, but if the cartilage is not, a successful result need not be expected. It is evident that many horses make a noise from other causes than paralysis of the arytenoid cartilage, and the noise is called roaring or whistling for the want of a better name. Up to the present I am sure many such cases have been operated

upon as roarers or whistlers, and have been numbered as examples of failures of the operation. The reputation of the operation is being damaged in this way."

These are very valuable suggestions which cannot be ignored, and no doubt that those who have performed a great number of operations and made minute observations can throw a great deal of light on the prognosis of this important surgical interference.

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606 AND GLANDERS IN LABORATORY ANIMALS.—Salvarsan has made its way in human pathology; it was but natural that its effects on animals should also call the attention of scientists. Prof. Mag. W. Benwolensky has published in a Russian journal his experiments on the effect of 606 upon the evolution of glanders in animals of the laboratory, which were recorded in the *Zeitschrift f. Wiss. und prakt. Veterinärmedizin*.

After considering concisely the importance of antisepsy in the struggle against infectious diseases, the author passes a review of the pharmaceutical products used against glanders. He then glances to the basis of the therapy with 606, or Salvarsan, treats of its literature, composition, mode of use, toxicology and doses.

In a second part of his work he makes known his own researches and described (1) the technic used in his experiments; (2) those very experiments, and presents his conclusions. Fifty-two animals were used—guinea pigs, rabbits and cats. The author has also searched what were the effects of the Salvarsan upon experimental glanderous process and its action upon the bacilli of glanders *in vitro*.

Prof. Benwolensky's conclusions are:

1. Injected into glanderous animals, the 606 has an influence on the progress of the disease.
2. This influence appears in a manifest manner, when one takes in consideration that glanderous animals succumb rapidly to acute glanders when they receive the injection of a dose.

nearly as the one which is supported, and that they survive after smaller doses.

3. In case of acute glanders, it is possible to sterilize the infected organism; as proved by the fact that cultures in media with blood of animals dead in those conditions remain negative.

4. It is probable that the destruction of glanderous bacilli in the organism takes place through two factors: (a) the chemical action of the Salvarsan; (b) the action of the antibodies which were formed under its influence.

5. From the results obtained, it is necessary to resort to small doses of the 606 to destroy the bacilli. This fact was observed by experiments *in vitro*. Solution of 1 in 40,000 kills the bacilli in one minute; solution of 1 in 100,000 kills them in three minutes; solution of 1 in 1,000,000 kills them in fifteen.

6. Strong doses of 606 kill a very great quantity of bacilli; but the products of the destruction give rise to rapid death of the experiment animals.

7. The best form of administration is in alkaline solution.

8. The product is best kept in liquid paraffin.

9. The best manner to administer 606 is by intravenous injection.

10. The maximum dose for intravenous injection is of 0.1 by kilogram of the weight of the animal for rabbits and 0.015 for cat. It is of 0.016 for subcutaneous injections in guinea pigs.

11. Besides its scientific interest, the product of Ehrlich has also a great practical value.

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VETERINARY DIRECTOR HONORED.—The *Société Centrale de Médecine Vétérinaire* of Paris, at the last sitting of November, 1911, has elected by a unanimous vote Dr. Veranus A. Moore, the Director of the New York State Veterinary College, as foreign corresponding member. The Veterinary Academy of France has done well in this selection of a gentleman who, by his numerous and scientific works on veterinary subjects, has

helped so much to the progress of comparative and veterinary medicine. Our confrères in America will appreciate the deserved compliment paid to Dr. Moore.

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BIBLIOGRAPHIC ITEMS.—From the Bureau of Animal Industry I have received three bulletins:

Bulletin 136—On the "*Diagnosis of Glanders by Complement Fixation*," by John R. Mohler, V.M.D., and Adolph Eichhorn. Dr. S—— I have already alluded to it in July last.

Bulletin 129—On "*Cattle Breeders' Associations in Denmark*," by Prof. T. Masmussen.

Bulletin 125—On "*A Comparative Study of Methods of Examining Feces for Evidences of Parasitisms*," by Maurice C. Hall, of the Zoological Division. In March last I called the attention of the readers of the REVIEW to Copzology, in a general way. The bulletin of Dr. M. C. Hall is treating of a special application of this means of diagnosis. The examination of feces for the presence or absence of parasites infesting the alimentary canal, cannot be ignored by practitioners, to whom it must be as interesting as it would to ordinary investigators. The methods to carry out the examination are quite numerous and considered by Dr. Hall. He also gives one of his own and makes a comparison of the results which he has obtained with it, and others, such as the smear, the sedimentation, the burette, the filter, etc.

Valuable practical information can be obtained by the reading of Bulletin 125.

A. L.

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### OUR ARMY VETERINARY SERVICE BILL.

In our "Army Veterinary Department" of this issue, on page 521, will be found much of interest not only to veterinarians in the army veterinary service, but to *all* veterinarians in America. First will be found an interesting account of the drawing up

of the present Bill, by Olaf Schwarzkopf, Veterinarian, Third Cavalry, U. S. Army. This is followed by a copy of the Bill; after which we have published a "Brief" showing the necessity of the enactment of the proposed Bill; and that is followed by the facts as related to the army veterinary service, set forth in Dr. N. S. Mayo's report on our Insular Possessions to the A. V. M. A. convention at Toronto, which we purposely held for use in connection with this Bill. For, while many veterinarians may be provided with copies of the Bill, still (as expressed by Dr. Schwarzkopf in his letter of transmittal), "by publishing it in the AMERICAN VETERINARY REVIEW, all veterinarians will have it." Not only that, but by giving the space that we have given to the publication of the Bill, Brief, and other matter consecutively, we have furnished veterinarians with a lot of instructive reading that they can carry conveniently about with them until they have familiarized themselves with the *whole subject* and will be in a position to show their Congressmen good reasons why this Army Veterinary Bill should become a law. Familiarization with the whole subject, gained by a careful perusal of the Brief, will do more besides loading veterinarians up with good argument for their Congressmen: it will load them up with enthusiasm—enthusiasm that only comes with a *realization of the present status of army veterinarians in the United States, how their status compares with that of other countries, and the elevating influence upon the veterinary profession in our own country, that would result from the proper recognition of the veterinarian in the United States Army.* An influence that is more powerful and far-reaching than occurs to many of us until we stop to give the matter a little time for thought from our busy lives. And we believe our "Army Veterinary Department" of the present issue will have the effect of *arresting* the attention of the American veterinary profession and concentrating its thoughts upon the subjects which that department has dealt with. The elevation of the veterinary profession forms an important part of the life-work of all of its worthy members; and nothing will expedite that work more than that of obtaining

the proper recognition of the veterinarian in the army. Concentrate all your efforts there and you will benefit your country, your brothers in the army veterinary service and the veterinary profession at large. Drs. D. Arthur Hughes and Walter G. Hollingworth, of the Committee on Army Legislation of the American Veterinary Medical Association, spoke enthusiastically and encouragingly of the prospects of accomplishing army veterinary legislation in the present Congress, at the Illinois Veterinary Medical Association in Chicago last month and stated that the committee was already actively at work preparing for the "charge." Let it be strong and unrelenting when it is made, and success is assured.

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#### AN EDUCATIONAL WEEK IN CHICAGO.

The week beginning December 4 was one filled with educational feasts at Chicago, for those in search of knowledge along the lines of sanitary science and the live-stock industry. For what with the Live-Stock Show (which, by the way, opened on the Saturday previous up at the stock yards), the United States Live Stock Sanitary Association, which opened at the Hotel Sherman on Tuesday the 5th, and the Illinois State Veterinary Medical Association, which opened at the Lexington Hotel on the 7th, it was a pretty full week.

The United States Live Stock Sanitary Association held one of the most successful and valuable meetings in its history, and increased its membership more than 100 per cent., having 66 when it convened and 151 when it adjourned, an addition of 85 new members; and its enterprising secretary, Prof. J. J. Ferguson, sees no reason why it should not have a membership of 500, which it no doubt will have at some time. The president of the association, Dr. John F. De Vine, sounded the gavel promptly at 9.30 a. m. of the 5th and introduced the Corporation Counsel of the City of Chicago, who welcomed the association to the city, which was responded to by Dr. M. P. Ravenel, of Wisconsin. President De Vine, realizing the extent of the pro-

gram before him, disposed of all business matters and committee reports with his characteristic expedition, and plunged immediately into the reading of papers. Dr. W. F. Crew, of Devil's Lake, N. D., read on "The Proper Organization of a State Live Stock Sanitary Commission"; Dr. J. I. Gibson on "The Province of the State Veterinarian in Sanitary Control Work." The relative merit of these plans was then discussed by Dr. D. F. Luckey, of Columbia, Mo.; Dr. P. F. Bahnsen, of Americus, Ga.; then discussed "Co-operation Between Federal and State Authorities in Control Work." These discussions were very instructive and interesting, coming as they did, extemporaneously, from two men thoroughly familiar with the questions at issue. Two papers on "Methods of Popular Education in an Anti-Tuberculosis Campaign were then presented by Mr. A. G. Glover, Editor of *Hoard's Dairyman*, Fort Atkinson, Wis., and Dr. Robert W. Ellis, Editor of the *AMERICAN VETERINARY REVIEW*, New York. Dr. K. F. Meyer, director of the Pennsylvania Live Stock Sanitary Laboratory, Philadelphia, presented an ably prepared paper on "The Newer Methods of Tuberculin Testing," and Dr. V. A. Moore, Director of the New York State Veterinary College, Ithaca, on "Bovine Tuberculosis, Its Problems and Control." The discussion of the subjects covered by these papers was opened by Dr. M. P. Ravenel, Wis.; the discussion covering location, prevention, eradication and popular education. Dr. A. T. Kinsley followed in the discussion, expressing it as his opinion that different methods of control must of necessity be applied in different states. Speaking of the application of the Bang system, the doctor believes that tubercle bacilli are kept on the premises in the manure, which is afterward spread on the land and carried beyond the domain of the segregated cattle by birds, chickens, etc., to other parts of the farm and to other farm animals, as hogs, etc. He believes in pasteurization of milk. The chair added to the discussion that, in his own state (New York), at the Wood Crest farm, where the Bang system was employed in a herd of 168 head, in which 60 per cent. of the cattle were found to be tuberculous at the beginning, that only one reactor

was found at the last test made, in a period of time covering less than three years.

Dr. J. G. Wills, of the New York State Department of Agriculture, stated that in about 600 cattle held under the Bang system by the state, 29 calves obtained from 40 reactors showed no reaction. Being questioned as to the age at which he tested the calves, he stated that he does not recommend testing them under six months of age. Milk from reactors in which no physical evidence of the disease can be detected, after having been heated to 185° F., may be fed to the calves, or (if we understood him correctly) sold under the law. Dr. J. I. Gibson, State Veterinarian of Iowa, who had asked the question as to the age at which the calves were tested, stated that while you get practically no reaction in yearlings under the Bang system, the same young stock tested at two years of age will give about the same percentage of reactors as their mothers. Dr. Cotton, of Minneapolis, expressed his belief in the application of the Bang system, stating that in herds where 95 per cent. reacted to the tuberculin test, at the beginning, only two calves reacted at the end of seven years. The calves in his experiments were allowed to suck the mother once, and thereafter were fed on Pasteurized milk. Dr. M. H. Reynolds, of Minnesota, expressed the opinion that the Bang system was impracticable except in pure-bred cattle, which he approximates as applying to about 2 per cent. of the cattle in the country, which renders its possibilities exceedingly limited. On the subject of popular education, the doctor endorsed Mr. Glover's suggestion of making it a part of the course at agricultural colleges, as set forth with great emphasis in his paper. Dr. Reynolds then made a motion that a committee of three be appointed to consider the possibility of popular education through the aforesaid agencies. The doctor is very enthusiastic on the subject and addresses farmers' institutes throughout his state, and does much in the way of popular education as a result of that sort of work. During these addresses and visits, during the coming winter, he hopes to distribute about 5,000 copies of the primer prepared by the Inter-

national Commission on Tuberculosis, and published by the United States Department of Agriculture. Dr. D. F. Luckey, in speaking of popular education, said that he believed in beginning with the young people who had not formed set ideas. Carrying out that idea, the doctor gives lectures in the public schools, and demonstrates them by preserved specimens of tuberculous lesions. He believes that by thus explaining and demonstrating to these children while in a receptive state of mind, he can accomplish much more than he can accomplish at farmers' institutes; especially where there is a foreign element. The doctor spoke at 31 public schools during November last. Dr. M. E. Knowles, State Veterinarian of Montana, told of some very effective popular education carried on by himself in inviting farmers and stockmen to be present at the slaughtering of reactors. The doctor stated that 600 visitors were present on such an occasion at Helena, and 250 on another occasion at Mossula. Dr. Knowles says the public has become so interested in the subject of clean milk in his state, that they have begun to express themselves in poetry—a sample of which he read and which will be published in our next issue. Dr. G. Ed. Leech said he would just as soon drink a menagerie as a cemetery, from which we infer that he is not in favor of Pasteurizing milk. He does not favor the Bang system, because he thinks it does not pay the farmer. He laid great stress upon the necessity of careful training in the man who is to make the tuberculin test; he must be a diagnostician, not a mechanic, as it is not a merely mechanical procedure. Dr. Reichel, of Pennsylvania, stated that they are able to raise healthy calves on Pasteurized milk if removed immediately from their mothers who are reactors. Dr. S. H. Ward, of Minnesota, looks upon reactors as being dangerous and believes that all reacting animals should be slaughtered. He urges great care in making the tuberculin test, stating that young stock will run higher after inoculation than old stock. For example, a young animal may run up to 105, whereas an old one may only reach 102 under the same conditions. He believes that all tuberculin should be under the control of the Bureau of Animal

Industry. His state (Minnesota) has a law that provides for the reimbursement to butchers, of animals in which they find tuberculous lesions in the carcass. One of the benefits of the operation of this law, the doctor explains, is that it often leads to the discovery of tuberculosis, by pointing to the vicinity from which the butcher purchased the cow. Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, summed up the matter in a paper. He said in part that forty-two states required animals to be tuberculin tested to be admitted within their borders for breeding purposes. He emphasized the fact that we must not lose sight of the value of physical examination in connection with the tuberculin test. He referred to dishonesty on the part of the person making the test as one of the principal causes of discredit of the test, and said he would like to see a law passed in every state causing the forfeiture of license to practice, of veterinarians making false reports. Dr. Luckey added that such a law is operative in Missouri.

The morning of the second day found the hall filled with enthusiastic listeners when Dr. A. W. Miller, of Iowa, presented his interesting and carefully prepared paper on "Dourine"; which was discussed by Dr. Gibson, of the same state, and several others. Both the paper and discussion were extremely interesting. A rare treat was then given the association in the form of a paper on "Sanitary Handling of Commercial Milk," by Prof. G. M. Whitaker, of Washington, D. C., followed by one on "Inspection and Regulation of City Milk Supplies," by Dr. Gottfried Koehler, of Chicago. Dr. Vander Slice, of Chicago, opened the discussion. He spoke of three grades of milk, as follows: Pasteurized, high grade or inspected milk, and certified. He believes that all dealers should be licensed annually, and should show themselves to be qualified to produce milk in a proper manner before being granted a license; just as a plumber or a barber is compelled to do before he can obtain a license to conduct his business. He spoke for certified milk, and stated that it does not require such a great amount of equipment to raise certified milk as is generally believed. He had seen a barn that

was less than the average in class, converted into a certified milk-producing plant for \$1,600. The doctor also referred to the elevating influence such a plant had on the neighboring farms; gradually and unconsciously they begin to improve. Dr. A. W. Evans, former Health Commissioner of Chicago, was asked by the chair to summarize the question, which he did in his usual masterly way, although he had not been fortunate enough to hear the papers. He said in part that there had been considerable speculation as to the relative nutritive values of raw and cooked milks. He believes that certified milk should be encouraged, but realizes that it cannot at present meet the demand nor the price, and clean, Pasteurized milk is the next best. Concentration of methods, rather than elaborate equipment; tuberculin testing and cleanly methods. He believes that when the sterilizing of milk in sealed bottles can be perfected, the matter will be much simplified. The only thing required is the proper form of bottle, and it can be accomplished just as easily as beer is now sterilized in sealed bottles. The doctor believes that for feeding babies, much benefit would be felt by a revival of the city dairies. Cleanliness, temperature and freshness are important factors in the production of a good milk for baby food; and milk produced two hours away from the baby is superior to that produced twelve hours away. Hence, the advantage of having the cows in the city limits. Hon. Raymond A. Pearson, Commissioner of Agriculture of New York State, was asked by the chair to say a few words, and stated, among other things, that there were four things necessary to the production of good milk—materials, methods, men and money. He emphasized the necessity of method; cleanly methods; and referred to the universal adoption of the covered milk pail, which he regards as an essential to cleanliness. The Commissioner believes in licensing milkmen and encourages popular education. He believes that the farmers are more willing to produce better milk than the consumers are to pay for it. He urged giving especial attention to the quality of dairy inspectors, and emphasized the importance of a standard which would improve the type. A number

of other important papers were presented, some running into the evening, among which were "Hog Cholera," by Dr. M. H. Reynolds, and "Experiences in Eradicating Tuberculosis from a Herd," by Dr. N. S. Mayo, at which we were unable to be present and therefore cannot give our readers the benefit of the discussions on them. At the conclusion of the evening session the association elected Dr. M. P. Ravenel to the executive office and re-elected Prof. J. J. Ferguson as secretary. Drs. Forbes, Niles, Hicks and Bahnsen and Mr. Chittick were elected as vice-presidents. This selection of men to fill the offices exemplifies the breadth of the organization. Its president is an M. D., four of the vice-presidents are veterinarians, the fifth a sanitarian, but a layman, and the secretary-treasurer a professor of animal husbandry.

The morning following the close of the Live Stock Sanitary Association meeting held in store for the visiting veterinarians at Chicago the meeting of the Illinois Veterinary Medical Association, and the inspection at the stock yards of about 140 head of cattle that had been previously tested under the direction of Dr. Mohler by the ophthalmic and intradermal methods; and the veterinarians divided themselves up between the two attractions. Those that attended the Illinois state meeting in the morning went with that association to the plant of the Abbott Alkaloidal Company at Ravenwood Station in the afternoon, and those that went to the stock yards in the morning spent the afternoon with Chief Melvin and Drs. Mohler and Hickman, chiefs of the two great divisions of the B. A. I. at Washington; Dr. Behnke, Associate Chief, and Drs. Bennett, Day and Sigmund, of the Chicago force, watching the slaughtering of the tested cattle and observing the post-mortem lesions; a golden opportunity for studying the relative value of the two tests in question, and also their relative value as compared with the present tuberculin test.

In the evening *all* met around the festive board as guests of Dr. W. C. Abbott, and after partaking of a generous repast, remained to ask and answer questions, as that was the program for the evening of the Illinois meeting. The papers were re-

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served for the next forenoon and the evening was given up to the "question box," which proved both interesting and instructive. After the reading of the papers the following day, the entire afternoon was given up to a surgical clinic at the Chicago Veterinary College. And during all this time, as stated in the beginning, there was the Live Stock Show at the great stock yards, where the finest of horses, cattle, sheep and hogs were on exhibition, and, in addition, pen after pen of selected carload lots of the finest of all breeds of cattle in the open yards. And finally, on Friday morning, a small party of veterinarians from the East were escorted through the canning plant of Libby, McNeil & Libby, through Swift's up-to-date butterine plant, Armour's place and several other places of interest by Dr. S. E. Bennett, Veterinary Inspector in Charge at Chicago, and Dr. A. E. Behnke, Associate Chief, Inspection Division, B. A. I., Washington, D. C. So we believe our readers will approve of the caption, "An Educational Week in Chicago." We are also able to promise them a secretary's report of these meetings in our next issue, the foregoing being merely a summary. Our impressions.

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**THE ACTUAL CAUTERY FOR THE RELIEF OF ROARING**—The actual cautery as a curative agent for roaring has lately been demonstrated by Dr. M. H. McKillip, of Chicago. The operation is performed through an opening in the crico-thyroidean ligament. The cautery is introduced into the ventricle and the mucous membrane cauterized. The operation can easily be performed without cutting any of the cartilages or without a general anaesthetic.

**MEETING OF COMMITTEE ON FIFTIETH ANNIVERSARY OF AMERICAN VETERINARY MEDICAL ASSOCIATION**—Dr. John F. Winchester, chairman, announces a meeting of the above committee at Reissenweber's, Fifty-eighth street and Eighth avenue, on Wednesday evening, January 17. There should be no difficulty in getting out a full attendance of the members of the committee, as the "Smoker" of the Veterinary Medical Association of New York City (see page 516) will be held at that hostelry the same evening, and veterinarians come from *everywhere* to attend that function.

## ORIGINAL ARTICLES.

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### THE RESULTS OBTAINED IN THE ERADICATION OF TUBERCULOSIS FROM A HERD BY THE USE OF TUBERCULOSIS VACCINE AND THE BANG SYSTEM.\*

BY S. H. GILLILAND, V.M.D., M.D., FORMER STATE VETERINARIAN AND SECRETARY OF THE STATE LIVESTOCK SANITARY BOARD OF PENNSYLVANIA.

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*(From the Laboratory of the State Live Stock Sanitary Board of Pennsylvania.)*

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In 1902 Dr. Leonard Pearson and the writer published "Some Experiments Upon the Immunization of Cattle Against Tuberculosis," and their conclusions were as follows:

"1. That after repeated intravenous injections of cultures of tubercle bacilli from human sputum, the resistance of young cattle to virulent tubercle bacilli of bovine origin may be increased to such an extent that they are not injured by inoculation with quantities of such cultures that are capable of causing death or extensive infection of cattle not similarly protected.

"2. That by intravenous injection much larger quantities of human sputum tubercle bacilli than are necessary to confer a high degree of resistance or immunity upon the vaccinated animal may be administered without danger to that animal."

Since that time many others have reported upon experiments with the object of increasing the resistance of cattle toward the tubercle bacilli. Among these have been Von Behring, Hutyra, Klimmer, Schultz, Arloing, Courmont, Moussa, Neufeld and

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\*Read before the Forty-eighth Annual Meeting of the American Veterinary Medical Association, Toronto, Can., August 22d-25th, 1911.

Meisner, Vallee, Weber and Fitze, Eber, Mohler and Schroeder, Trudeau and Baldwin, and many others in this country and abroad have done much work upon the subject.

Owing to the great volume of literature on this problem, I shall not attempt to incorporate an abstract of the same in this paper.

In 1904 Dr. Leonard Pearson was called upon to give advice relative to the eradication of tuberculosis from a herd consisting of approximately 200 head of cattle, including dry cows, bulls and heifers over one year of age. At the conference it was decided that the herd should be carefully tested with tuberculin, all reactors to be removed from the main barn and kept rigidly isolated from non-reactors. The herd consisted of thoroughbred Guernseys, Holsteins and grades, and it was further agreed upon that if any of the most valuable animals should react they were to be isolated, placed upon the Bang system, and to be treated with tuberculosis vaccine with the object of saving their offspring. This work was placed in my charge, and has been under my direct supervision since the start.

A thorough tuberculin test was made during May, 1904, of the milking herd consisting of 160 animals, of which 42 animals, or 26.2 per cent., reacted. Calves under eight months of age were excluded from the test, owing to the fact that the preliminary temperatures were too high to make the test of any value.

The reacting animals were removed immediately from the herd. A number of these animals were registered, some of which had taken prizes at the Buffalo Exposition in the Guernsey class. Nearly all of these reactors were in various periods of gestation, and it was considered advisable to keep them for their offspring. They were placed in a stable approximately 100 yards from the stables in which the main herd is kept, and situated at the foot of a hill, thereby permitting no drainage from this infected stable to the other buildings. It was the duty of one man to care for these reactors, and he was *not* permitted to mingle with the employees of the milking herd, visit the stables, or to allow

any interchange of utensils such as buckets, forks, shovels, wheelbarrows, etc., from the infected stable to any of the other stables. I shall refer to these reactors later in the article, but will now ask your attention to the care of the milking herd.

The main milking herd was stabled in four barns, varying from 12 to 48 animals in each barn. Inasmuch as some reactors had been found in every barn, a thorough disinfection of all stables was made. The windows and doors of the barns were tightly sealed and the interior filled with formaldehyde gas, the gas being generated by the addition of potassium permanganate to formalin, and left sealed for 18 to 20 hours; after which the doors and windows were opened and the stable thoroughly aired. The woodwork and iron stanchions were washed with a solution of carbolic acid. The floors in all the stables except one were of cement, and were flushed with a solution of sulphate of iron and afterwards carbolic acid. A coat of whitewash including 2 per cent. carbolic acid was applied to the ceiling and walls. The manure was removed to the fields, and the pit in which it was stored was covered with chloride of lime. The policy of this farm is not to pasture their milch cows, but to place them in a shady exercising yard a portion of the day. This yard was scraped, removing several inches of earth, and then covered with lime. All utensils around stables were disinfected.

Even with the disinfection as outlined it was believed that there still might remain some possible points of infection in the stables or exercising yards. Also, it seemed reasonable to believe that some non-reactors might carry within their body some tubercle bacilli which had not as yet had time to produce a distinct tubercle and therefore were incapable of giving a tuberculin reaction.

The method outlined at that time to eliminate all the suspicious animals and keep the herd free from tuberculosis was as follows:

*First*—All the animals in the milking herd were to be tuberculin tested every six months until two successive negative tests were obtained and then yearly thereafter.

*Second*—The calves that were intended to become future members of the milking herd were to be immunized by the use of intravenous injections of human tubercle bacilli which had been found by experimentation to be non-virulent for cattle.

*Third*—All cows newly purchased, before being allowed to enter the main herd, were to be placed in a quarantine stable about one hundred and fifty feet from the regular barns in which the milking herd was kept and then tested with tuberculin.

I do not consider this plan the best method for handling newly purchased animals, as there is a chance of reinfecting the herd. It appears to me that it would be far better if a regular quarantine barn could be maintained at least one hundred yards from the main buildings and all recently purchased animals be kept therein for a period of three months before entering the herd. This plan would permit of a tuberculin test at the time of purchase as well as another test just prior to entering the herd. In this manner it would be possible for one to detect any animals that were "plugged" by a dishonest dealer.

In the spring of 1905, approximately one year from the first test, the herd was again tuberculin tested. Conditions arose which made a tuberculin test six months following the initial test, as originally planned, impossible. The results obtained were as follows:

Date of test, June, 1905—

|                                     |      |
|-------------------------------------|------|
| Number of animals tested.....       | 120  |
| Number of animals reacted.....      | 13   |
| Percentage of animals reacting..... | 10.8 |

It was generally customary to apply the tuberculin test during the cool months of the fall and spring.

The tuberculin test in November of the year 1905, which was approximately five months from the preceding test, resulted as follows:

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 137 |
| Number of animals reacted.....      | 7   |
| Percentage of animals reacting..... | 5.1 |

The tuberculin tests following the date above mentioned up to the present time gave the following percentages of reaction:

*Results of Tuberculin Tests, 1906.*

Date of test, April—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 154 |
| Number of animals reacted.....      | 13  |
| Percentage of reacting animals..... | 8.4 |

Date of test, November—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 137 |
| Number of animals reacted.....      | 5   |
| Percentage of reacting animals..... | 3.6 |

You will note that the percentage of reactions obtained in April, 1906, was 3.3 per cent. higher than those obtained in November, 1905. The only explanation I can offer for this is the fact that during the winter months the animals were more closely stabled and were frequently changed from one stable to another. Again, there were a number of newly purchased animals entered into the herd during the winter which had only been tested at the time of purchase, and were not kept for any length of time separate from the main herd after their arrival at the farm.

I believe it is of value in the elimination of tuberculosis from a herd for each animal to have a certain stanchion or stall in which it remains during its time of service in the herd.

*Results of Tuberculin Tests, 1907.*

Date of test, April—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 201 |
| Number of animals reacted.....      | 0   |
| Percentage of reacting animals..... | 0   |

Date of test, October—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 131 |
| Number of animals reacted.....      | 0   |
| Percentage of reacting animals..... | 0   |

At the time of the October test there was one cow exhibited a rise in temperature to  $104^{\circ}$  F. at the sixteenth hour following injection, though all the temperature measurements prior to the



SHOWING METHOD OF VENTILATION, STABLING, FEEDING, WATERING, ETC.

sixteenth hour, as well as those following the sixteenth hour, were below  $102.5^{\circ}$  F. Therefore she was not considered a positive reactor, though she was removed and isolated from the herd for six months, when she was again tuberculin tested and gave a perfectly clean test and has continued to do so up to the present time.

*Results of Tuberculin Tests, 1908.*

Date of test, April—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 145 |
| Number of animals reacted.....      | 2   |
| Percentage of reacting animals..... | 1.4 |

Date of test, November—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 169 |
| Number of animals reacted.....      | 3   |
| Percentage of reacting animals..... | 1.8 |

The only explanation that I can offer for the reinfection of the herd is that during this year the attendant of the tuberculous animals upon the Bang system severed his connection with the farm and another man was obtained to do his work who was not as careful in seeing that there was no interchange of utensils used in the barn containing the tuberculous cows and the stables of the main milking herd. In investigating the matter I also was informed that he would constantly associate with the employees in charge of the milking herd.

*Result of Tuberculin Test, 1909.*

Date of test, April—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 151 |
| Number of animals reacted.....      | 0   |
| Percentage of reacting animals..... | 0   |

On account of obtaining no reactions on this test and having a fear of injecting tuberculin too frequently, thereby destroying the sensitiveness of the body cells to the same, no other test was made until the following year.

*Result of Tuberculin Test, 1910.*

Date of test, May—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 151 |
| Number of animals reacted.....      | 5   |
| Percentage of reacting animals..... | 3.3 |

The explanation for the reinfection of the herd the second time is as follows: At the time of the test in November, 1909, two cows gave a rather definite reaction. Inasmuch as they were valuable animals it was the owner's desire that they be held for a retest, which was granted. The history and tuberculin test of

these two animals is rather interesting, and I shall give the same in detail. The animals are known as Proceda and Francelmar. The test of 1908 in which they gave positive reactions is as follows:

*Tuberculin Test, November 20, 1908.*

|              | Proceda—<br>Preliminary<br>Temperatures. | Francelmar—<br>Preliminary<br>Temperatures. |
|--------------|--|---|
| 5 a. m.....  | 101.4                                    | 101.4                                       |
| 7 a. m.....  | 102.                                     | 102.  |
| 9 a. m.....  | 101.6                                    | 101.8                                       |
| 11 a. m..... | 101.6                                    | 101.6                                       |
| 1 p. m.....  | 100.6                                    | 100.2                                       |
| 3 p. m.....  | 101.                                     | 101.6                                       |
| 5 p. m.....  | 101.6                                    | 102.4                                       |

8 p. m., injected—dosage, 1 drachm of solution for each animal containing 1,200 milligrams concentrated tuberculin.

*November 21, 1908.*

|              | Temperatures<br>Following<br>Injection. | Temperatures<br>Following<br>Injection. |
|--------------|---|---|
| 5 a. m.....  | 101.4                                   | 100.6                                   |
| 7 a. m.....  | 102.2                                   | 101.4                                   |
| 9 a. m.....  | 102.2                                   | 100.8                                   |
| 11 a. m..... | 102.4                                   | 101.6                                   |
| 1 p. m.....  | 104.6                                   | 102.2                                   |
| 3 p. m.....  | 106.6                                   | 104.                                    |
| 5 p. m.....  | 105.                                    | 105.                                    |
| 7 p. m.....  | 105.4                                   | 106.                                    |

I beg to call your attention to the fact that the rise of temperature did not occur until the seventeenth hour, though the reaction in both cases was very distinct. There have been many cases come to my attention while State Veterinarian of Pennsylvania and at other times when the veterinarian applying the tuberculin test felt that it was not necessary to take more than three temperature measurements following the injection of the tuberculin, and that these measurements need not be taken after the sixteenth hour. It seems to me that we have ample proof to show that this is a very erroneous way of applying a test as valuable as the tuberculin test, and in this manner many animals have escaped.

These two animals were removed from the milking herd and placed in a barn some distance from the main stable and were attended by a party who had no connection with the milking herd, but who attended to a bull and a lot of calves which will be mentioned later. They were kept separate and their milk pasteurized for a period of eighty-two days, when they were again tuberculin-tested with the following results:

*Tuberculin Test, February 10, 1909.*

|              | Proceda—<br>Preliminary<br>Temperatures. | Francelmar—<br>Preliminary<br>Temperatures. |
|--------------|--|---|
| 5 a. m.....  | 102.4                                    | 102.4                                       |
| 7 a. m.....  | 102.                                     | 102.1                                       |
| 9 a. m.....  | 99.4                                     | 101.2                                       |
| 11 a. m..... | 99.4                                     | 100.4                                       |
| 1 p. m.....  | 100.4                                    | 100.8                                       |
| 3 p. m.....  | 100.6                                    | 101.  |
| 5 p. m.....  | 102.2                                    | 101.4                                       |

8 p. m. injected—dosage, 1 drachm of solution for each animal, containing 1,200 milligrams concentrated tuberculin.

February 11, 1909.

|              | Temperatures<br>Following<br>Injection. | Temperatures<br>Following<br>Injection. |
|--------------|---|---|
| 5 a. m.....  | 102.6                                   | 100.6                                   |
| 7 a. m.....  | 102.4                                   | 101.4                                   |
| 9 a. m.....  | 100.6                                   | 101.                                    |
| 11 a. m..... | 101.2                                   | 102.                                    |
| 1 p. m.....  | 103.                                    | 102.2                                   |
| 3 p. m.....  | 101.2                                   | 101.4                                   |
| 5 p. m.....  | 103.                                    | 101.6                                   |
| 7 p. m.....  | 102.6                                   | ....                                    |

It will be noted that the one animal gave a temperature at 1 p. m. of 103°, and again at 5 p. m. of 103°, but the intermediate temperature at 3 p. m. was normal, and it was considered that the irregularity in the temperature measurements was due to some other cause rather than tuberculosis. It has not been the experience of the writer that a tuberculous animal will give a rise in temperature, a fall, and then another rise following the injection of tuberculin unless there has been some local cause for the same, such as undue excitement, drinking cold water, feeding, milking, etc. Following this test, which was considered negative, these animals were returned to the milking herd. They were again tested on April 27, 1909, and May 4, 1910, at which time they both gave negative tests.

During the latter part of the summer of 1910 it was noticed by the superintendent of the farm that these two animals aforementioned were not in the best of condition and were, therefore, again removed from the herd and kept separate for several months, during which time they continued to lose flesh, coat became rough and cough increased. This action was taken by the superintendent during my absence abroad, and upon my

return I advised the killing of these two cows. The autopsy revealed extensive tuberculosis of the glands and other organs of both the thoracic and abdominal cavities.

This experience, taken in conjunction with a number of others that I have had during the past two years, leads me to believe that an animal that has once reacted to the tuberculin test in a positive manner must be considered a tubercular subject, no matter what subsequent tests may reveal. It may be, however, that some reactors will live for a number of years following the date of their initial reaction without showing any clinical symptoms of tuberculosis.

It is my belief that these two animals, namely Proceda and Francelmar, are responsible for the reinfection of the herd and of the percentage of reactions obtained during the year 1910.

As aforesaid, five animals reacted during this year. One was an animal that had been purchased in New York since the previous test. Another was an animal that had been purchased by an employee of the farm three or four months prior to the injection of tuberculin. This animal, however, was kept separate from the herd, but the owner was constantly associated with the milch cows as he had a certain number of animals to feed, milk and care for each day. The third animal was one that had been vaccinated with tuberculosis vaccine for two years previous, and at the time of test showed an enlargement of the left fore knee joint. The reaction in this animal was not typical, but it was decided to sacrifice the same in order to determine the cause of the enlarged knee. Upon autopsy it was found that the bursa, through which the anterior extensor runs, was greatly enlarged, indurated and inflamed. No macroscopical lesions of tuberculosis could be found. Microscopical examination revealed no tubercle bacilli, and guinea pigs inoculated with this material remained healthy for a period of three months, when they were killed, and all organs, membranes, etc., were found normal.

The remaining two reacting animals had been in the herd for more than two years and upon autopsy showed small progressive foci of tuberculosis in the various glands and organs.

The herd was not again tested for nine months, with the following results:

*Result of Tuberculin Test, 1911.*

Date of test, January—

|                                     |     |
|-------------------------------------|-----|
| Number of animals tested.....       | 160 |
| Number of animals reacted.....      | 4   |
| Percentage of reacting animals..... | 2.5 |

Four other animals which had received several years prior to the test four doses of tuberculosis vaccine, gave rather suspicious reactions and were removed from the herd, though two of them are not included in the above percentage of reactions, for upon autopsy they showed no lesions whatever.

It was not possible for the writer to be present at the autopsies, though Dr. B. T. Woodward, of the Bureau of Animal Industry, and Dr. W. L. Moss, of Johns Hopkins, conducted the same, and I have the following report from Dr. R. W. Hickman, Chief of the Quarantine Division of the Bureau of Animal Industry.

“Referring to cattle \* \* \* which were slaughtered at the Baltimore Butchers’ Abattoir, Baltimore, Md., January 31, and post-mortem examinations by Dr. B. T. Woodward, of this office, together with your representative, you are advised that the cow Turby immunized showed a supra-mammary gland the appearance of which was suspicious of tuberculosis. This tissue was submitted to the pathological division of the bureau and two guinea pigs were inoculated February 2. When examined at autopsy on March 7, both of these test animals were found to be tuberculous.

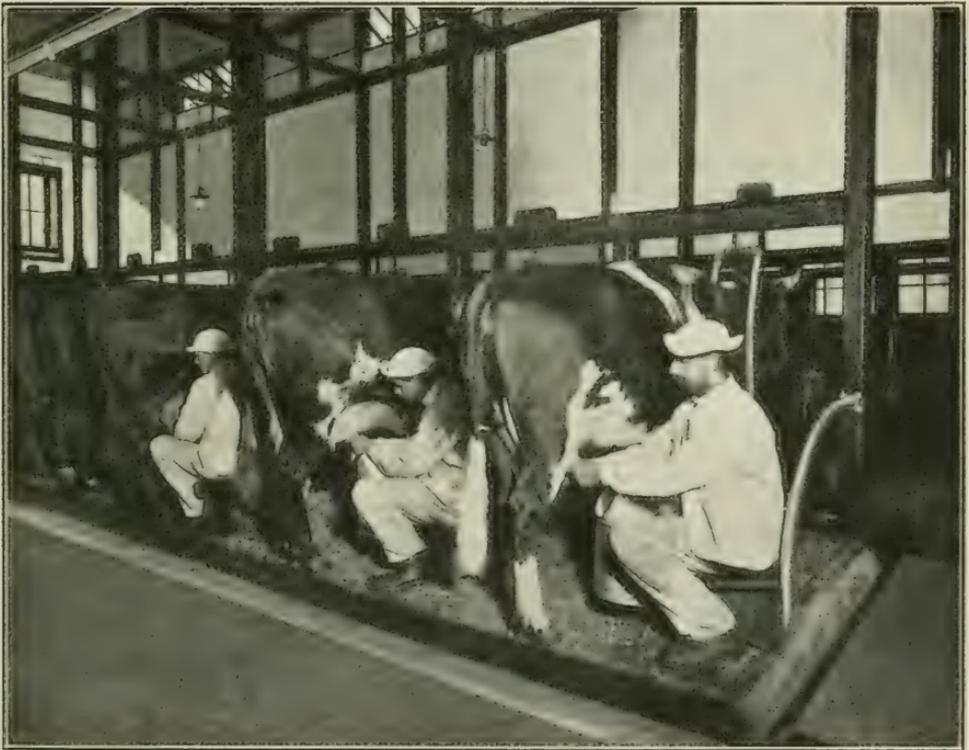
“The tubercle bacilli in both instances were similar in appearance and were composed mainly of individuals of medium, long and in some cases slightly curved formation, but experiments were not made to determine other characteristics which would justify their definite classification into the human type.

“ ‘Masher’s Repose,’ immunized, showed a suspicious supra-mammary gland, but tubercle bacilli were not demonstrable microscopically or through the inoculation of guinea pigs.

“ ‘Proda’s Sultana 2d,’ immunized, showed hæmorrhagic bronchial glands.

“ ‘Dewey’s Ship,’ immunized, showed slight calcified areas in a sub-lumbar gland.

“ All carcasses were passed for food.”



CARE USED IN KEEPING ANIMALS AND STABLE CLEAN.  
METHOD OF MILKING.

The animal Turby, which showed no macroscopical lesions, though the suspected material from the supra-mammary gland when injected into guinea pigs was capable of producing generalized tuberculosis, was given her first dose of tuberculosis vaccine March 7, 1909, and four subsequent doses between the time mentioned and January 27, 1910. During this time she

was allowed to mingle with the other members of the herd which were believed not to be infected. However, the test of 1910 showed that the herd contained affected animals, and it is probable that this particular animal may have become infected during this time, inasmuch as it is known that an animal has less resistance for a short time (4 to 6 weeks) following the vaccination than normal.

In the case of the second immunized animal, "Dewey's Ship," another explanation can be offered. This animal was first vaccinated against tuberculosis on January 30, 1905, and received three vaccinations ending June 15, 1905, and it is within reason to believe, with the knowledge at hand, that the immunity conveyed by the vaccine had been lost in the length of time.

To briefly summarize the results obtained by the application of the tuberculin test, I herewith give the following table:

|                | Percentage. |
|----------------|-------------|
| 1904 .....     | 26.2        |
| 1905.          |             |
| June .....     | 10.8        |
| November ..... | 5.1         |
| 1906.          |             |
| April .....    | 8.4         |
| November ..... | 3.6         |
| 1907.          |             |
| April .....    | 0           |
| October .....  | 0           |
| 1908.          |             |
| April .....    | 1.4         |
| November ..... | 1.8         |
| 1909.          |             |
| April .....    | 0           |
| 1910.          |             |
| May .....      | 3.3         |
| 1911.          |             |
| January .....  | 2.5         |

It is of interest to know that during a part of the period above mentioned two bulls which had reacted to the tuberculin test but showed no clinical evidence of tuberculosis, were used for breeding purposes in connection with cows in the main milking herd. This was done in order to obtain the offspring, as the bulls in question were considered to be of the best Guernsey blood in this country. Both animals during their period of service were kept by themselves, entirely separate from the herd, in a specially constructed barn allowing plenty of light and ventilation, with a large exercising yard enclosed by a plank fence five feet high. The following rules were carefully observed in the case of these animals as well as in breeding cows to them:

I.—The animal is at all times to be kept well isolated from the main herd in a specially constructed stable and is to be attended by an employee who has no connection with the other cattle.

II.—All utensils used in his care, such as buckets, brooms, forks, halters, feeding boxes, brushes, curry combs, etc., are under no condition to be removed from his stable and taken to another stable unless they are thoroughly cleansed and disinfected with a 5 per cent. solution of creolin or carbolic acid.

III.—He is to have a special halter and lead pole that must never be used for any other animal.

IV.—A special place, preferably close to his stable, should be selected for service, and no circumstance should permit him to be taken into the yards or stables of the main herd.

V.—After a cow has been served by him they should be separated at once and the cow sponged with a 3 per cent. solution of creolin or carbolic acid *before* being returned to the main stable.

After 18 months or more of service it was noticed that these bulls began to lose flesh and exhibit other symptoms indicating the advancement of the disease. Their use as sires was discontinued and later they were killed, and upon autopsy showed generalized lesions of tuberculosis. Even though precautions were taken to prevent these animals from endangering the herd, it is

possible that they may have been partially responsible for a percentage of the reactions obtained.

It seems unfortunate that this herd should have been freed from tuberculosis twice and as many times reinfected. However, I do not believe that it is possible to keep a herd entirely free from tuberculosis in which new animals are being constantly purchased and entered into the herd upon the tuberculin test at the time of purchase. After a herd has been gotten free of tuberculosis, the best manner to keep from reinfesting the same is to endeavor to raise all animals needed for future milkers from the tuberculous-free cows on the farm.

We shall now consider the second phase of this problem, namely, the value of the immunization of the young calves intended for future members of the herd by the use of tuberculosis vaccine.

The vaccine consists of tubercle bacilli of the human type which have been found to be non-virulent for cattle, suspended in normal saline solution. The particular culture known as Culture M, used in the herd referred to, was obtained from the sputum of a young girl. The sputum upon microscopical examination contained vast numbers of tubercle bacilli. Each microscopic field showed fifty to one hundred bacilli. There did not appear to be any extensive pulmonary tuberculous process upon clinical examination. The culture was isolated in 1901 and its virulence was carefully tested upon guinea pigs, rabbits, calves, sheep and horses. It was found, if given in larger quantities to bovine animals, it was incapable of producing lesions of tuberculosis. These injections were made subcutaneously, intraperitoneally and intravenously.

The suspension of the tubercle bacilli in the salt solution used for the vaccination work was made so that 1 c.c. of the suspension represented 1 milligram of dried tubercle bacilli. Fresh cultures were used and no vaccine was prepared more than thirty-six hours prior to injection. The vaccine was injected directly into the jugular vein.

During the years 1904, 1905 and 1907 it was the policy to give the calf the first vaccination when three or four weeks of age, and subsequent vaccinations at intervals of four to five weeks. Since 1907 the calves have been taken away from their dams soon after birth and placed in a stable specially constructed for their care and which can easily be disinfected at any time. Believing that there was *no* danger of the calves contracting tuberculosis while kept in this stable and fed upon pasteurized milk, the initial vaccination was not given until the animal had attained the age of at least eight to ten weeks. The interval between subsequent vaccinations was also lengthened.

Dr. Leonard Pearson and the writer discovered about this time that it was important, if one wanted to obtain success in increasing the resistance of cattle against tuberculosis, to keep the animals during and for not less than six weeks following the last vaccination in a manner in which there would be no possible chance of infection. It appears that the normal resistance of an animal is lowered during the period of vaccination.

During the year 1904 there were thirty-two calves vaccinated with vaccine prepared after the method above outlined. The number of doses given was three, the first consisting of  $2\frac{1}{2}$  c.c., the second of  $4\frac{1}{2}$  c.c., and the third  $7\frac{1}{2}$  c.c. After the third vaccination was completed these calves were turned to pasture and contracted lung worms (*Strongylus micrurus* or *Pulmonalis*), and twelve of them died from the same. There are six of these animals in the herd at the present time and the remaining number have either been sold as milch cows or slaughtered for beef, owing to the fact that they did not produce a sufficient number of pounds of milk yearly to warrant keeping them in the herd. It has been the policy of this farm to have a standard number of pounds of milk for each breed, and if the animal falls below this standard during a period of lactation it is disposed of to the butcher.

In 1905 there were forty-two calves vaccinated, each animal receiving four vaccinations, the initial dose being 1 c.c., the second dose  $2\frac{1}{2}$  c.c., the third dose 5 c.c., and the fourth dose

7½ c.c. Six of these animals are in the herd at the present time. The others have been disposed of either for beef or sold to other parties for dairy purposes.

For the year 1906 the records show that thirty-eight animals were vaccinated, receiving three vaccinations, the dosage consisting of 1, 3 and 5 c.c. respectively, and extending over a period from May 14 until September 5. Of the number vaccinated during this year there are six remaining in the herd.

Twenty-two animals were vaccinated in the year 1907, the majority of which received four vaccinations, over a period from October 23, 1907, to March 23, 1908. The doses consisted of 1 c.c., 2½ c.c., 4 c.c., and 6 c.c. Two of these animals received but three vaccinations and three animals received but two vaccinations. Of the twenty-two animals vaccinated there are eight in the milking herd.

During the years 1908 and 1909 there were fifty animals vaccinated, forty-one of which were given ten vaccinations, covering a period of approximately one year's time. The increased number of vaccinations were given in order that another experiment could be started to determine whether the milk of animals hyper-immunized had any protective value against tuberculosis. This experiment is under progress at the present time and the results will be published at a later date. The remaining nine animals vaccinated during the two years above mentioned, received four vaccinations covering a period of six months. All of these animals are still members of the herd except five, which have either been sold or slaughtered for meat purposes.

Only one-half of these animals have given birth to their first calf and are members of the milking herd, though they are kept in a separate stable some distance from the main barn owing to the fact that they have not lost their sensitiveness to tuberculin and will react if injected with a regular dose of the same. It is the owner's desire to have his main milking herd known as one that contains no tuberculin reacting animals. This is also a regulation of some of the larger cities in which the milk is sold.

To briefly summarize, we find that since 1904 we have vaccinated 184 calves, of which forty-six are in the main milking herd at the present time. Of the 143 animals that were sold for breeding purposes, for beef, or that died from lung worms, etc., post-mortem examinations were obtained on approximately 100 head and no lesions of tuberculosis were found in any except those aforementioned following the tuberculin test of 1911.

There were no calves vaccinated that were born in the years 1910 and 1911, as most of these calves the owner desires to sell to parties in either his own state or in other states. It has been found that animals receiving tuberculosis vaccine will react to tuberculin for a certain length of time following the final vaccination. This reaction to tuberculin interferes with interstate shipments, and for this reason the vaccinations were discontinued for the period aforementioned, but it is my intention to vaccinate all calves this fall that have been born during the summer months and are desired for future members of the herd. This decision has been brought about by the fact that a few months ago a lot of fourteen calves that were stabled in a barn which had been previously used to keep reacting animals in, seemed to be unthrifty. One of these calves died from some unknown cause and upon post-mortem examination a suspicious lymphatic gland was found. Upon section it showed no distinct tubercle formation but was sent to Johns Hopkins University for microscopic examination, and tubercle bacilli were found in the smears made from the same. This stable before the calves were placed therein had been thoroughly disinfected. In order to determine the extent of infection of this lot of animals, six of the others were killed after having given positive tuberculin reactions, and upon autopsy showed incipient active foci of tuberculosis. These animals had not received any tuberculosis vaccine. The remaining animals of this lot which did not react to tuberculin will be carefully watched and not allowed to mingle with other members of the herd until they have been given another negative tuberculin test.

It is of interest to know that this particular lot of calves were taken care of by the same party who had charge of the two cows aforementioned, that is, Proceda and Francelmar, which were killed upon physical examination. This may have been the source of infection of this lot of calves.

It is my belief that if these animals had been vaccinated with tuberculosis vaccine within eight or ten weeks following their birth, they would have had sufficient resistance to withstand the slight infection to which they were subsequently exposed.

Vaccinated animals have been tuberculin tested at intervals of one month from the third month to the twenty-fourth month following the final vaccinations in order to determine at what period they lose their sensitiveness to tuberculin. The time when the sensitiveness is lost has been found to be rather irregular, varying from six months to nineteen months. It is not my belief, however, that the sensitiveness to tuberculin has any relation to the degree of immunity that the animal may have against tuberculosis.

We come now to consider the animals which had reacted to the tuberculin test and were considered to be of sufficient value to be placed upon the Bang system with the main object of saving their offspring. From the reacting animals in 1904, twenty-four cows, heifers and bulls were saved. In 1905 there were eleven animals reserved for this purpose.

These animals were thoroughly isolated from the main milking herd, attended by one man, and the milk was adequately pasteurized before being used for any purpose.

In 1904, Dr. Leonard Pearson and the writer published an article entitled, "The Effect of Tuberculosis Vaccination Upon Cattle Infected with Tuberculosis." The experiment was made upon twelve yearlings of the Shorthorn breed. The animals were approximately the same age and size and had, just prior to the starting of the experiment, reacted to the tuberculin test. It was believed that the lesions they contained were not far advanced and they would be good subjects for such work. In conclusion, the article states: "We believe we have sufficient evi-

dence to justify the statement that the treatment to which six of the animals were subjected had the effect of not only keeping in check the progress of a tuberculous process, but in causing a distinct and in some cases a great retrogression of the lesions. In other words, the treatment had a distinct curative effect." With this knowledge at hand it was decided to keep the valuable reacting animals of this herd isolated and handle them in accordance with the Bang system, as well as to treat them with tuberculosis vaccine and tuberculin.

They were first given an intravenous injection of tuberculosis vaccine. The dose depended upon the age, size and physical condition of the animal and ranged from 4 c.c. to 10 c.c. of a standard suspension of tubercle bacilli of the human type. This was followed at intervals of seven days with increasing doses of tuberculin until three injections were given. Then a second injection of tuberculosis vaccine, the dosage being the same as the initial injection, was given. This was followed by three weekly injections of tuberculin, increasing the dose with each injection. Finally a third dose of tuberculosis vaccine was given, followed by weekly injections of tuberculin, increasing the dosage at each injection until the animal ceased to react.

I regret very much that I do not have a complete record of the offspring of these animals, but I feel safe from the information I have at hand to state that fifty per cent. of all calves born were saved.

The plan was to remove the calf from the infected stable as soon as dropped, sponge it thoroughly with a solution of creolin, remove it to non-infected quarters and to feed it artificially upon pasteurized or sterilized milk. In some of the animals the treatment seemed to have no beneficial results, while in others most encouraging results were obtained.

These animals were slaughtered at various times throughout the experiment, the last being killed April 19, 1907. In eight animals of the thirty-five animals in the experiment no macroscopical lesions of tuberculosis could be determined after a careful post-mortem examination. In ten of the remaining animals

only small calcareous lesions could be found. These were well encysted with a thick, hard, grayish, fibrous wall. The best results were obtained in those animals in which the initial lesion was small and inactive at the time the treatment was begun.

In conclusion, it is my belief where a herd that contains valuable animals both for breeding and dairy purposes, and in which there is over 8 per cent. of tuberculosis, the disease can be most easily and economically eliminated by applying the tuberculin test every six months combined with the use of tuberculosis vaccine and the Bang system, for reactors from which it is desired to save the offspring.

The use of tuberculosis vaccine has not as yet reached a practical stage and must remain in the hands of laboratory workers until more knowledge is obtained upon anaphylaxis, duration of immunity and the tuberculin test upon vaccinated animals.

To free a herd from tuberculosis it is necessary to have a quarantine barn for all newly purchased animals and to keep the same therein for a period of not less than three months before placing them with the main milking herd.

Before closing, I desire to acknowledge the valuable suggestions and advice given me by Dr. Leonard Pearson, who at all times was willing to assist me in every way possible. Further, I desire to express my thanks to Dr. E. S. Deubler and to Dr. E. L. Cornman for general assistance in making the tuberculin tests and the vaccinations of the young calves. I beg to acknowledge much assistance rendered me by Dr. F. A. Mackie and Dr. W. L. Moss in post-mortem examinations. I am also greatly indebted to the owner for his ready co-operation with all suggestions given, without which it would have been impossible to have continued this work.

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WE desire to correct a typographical error in the eleventh word of the first line in the last paragraph of Prof. Sisson's article on page 323, December REVIEW, and to apologize to the author for having let it get past us. The word "impossible" should read "possible."

## BOVINE TUBERCULOSIS, ITS PROBLEM AND CONTROL.\*

By VERANUS A. MOORE, ITHACA, N. Y.

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There is perhaps no single disease that has aroused more interest and that is of greater significance to the livestock industry of this country than bovine tuberculosis. In the evolution of the present knowledge of this affection there have been many findings of such apparent far-reaching significance that they have each in turn formed an independent basis for a somewhat definite line of procedure directed toward its elimination. The sanitarian, however, must not be content with partial findings nor hope for success by applying methods that are based on too few of the many phases in the complete cycle of the disease to be controlled. If we are to appreciate the problem of bovine tuberculosis and to grasp the principles involved in its control, we must put aside our theories, until the full array of facts is before us concerning the life history of its etiology, its channels of invasion and means of elimination together with an understanding of the tissue response to its entrance. When these are fully known, it will not be difficult to ascertain how to interpose a barrier that will inhibit its further spread. But when regulations for control are based on a few facts which do not include all of the essential processes of the disease, complete success cannot be expected. It has not infrequently happened that sanitary measures have failed completely when but a part of the truth concerning the nature of the disease was known. An illustration of this is found in the numerous methods tried with negative results for the control of malaria, after its cause was discovered but before it was known that it was carried by the anopheles mosquito.

In order to circumscribe the problem centered in the nature of bovine tuberculosis and the many obstacles to its eradication it may be well to review briefly the succession of discoveries concerning it and the conclusions immediately drawn from them

\* Read at the Meeting of the United States Live Stock Sanitary Association, Chicago, December 5, 1911.

that have operated to bring about existing laws and regulations for its suppression.

The discovery of the tubercle bacterium by Koch in 1882 brought the subject of tuberculosis and man's responsibility concerning it for the first time clearly before the public. The masterly presentation of his findings seemed to leave no doubt of the identity of tubercle bacteria in mammals. This conclusion was accepted and leading bacteriologists of the time attested to its correctness. A new etiological factor had been revealed which possessed peculiar biochemic and pathogenic properties that differentiated it from all other microorganisms. This discovery brought tuberculosis clearly before the world as an unnecessary destroyer of man and beast, and initiated the first step in its control, namely, efforts to prevent infection.

The next epoch-making discovery was again the handiwork of Koch who in 1890 showed that the liquid on which tubercle bacteria had grown would produce a distinct temperature reaction when injected into tuberculous individuals. When this substance (tuberculin) was applied to cattle it was found that a much larger percentage was infected than was supposed and that many apparently healthy animals reacted and upon slaughter were found to be more or less diseased. The conclusions hastily drawn from these findings, namely, (1) that the large amount of tuberculosis in man was due to infection from cattle, (2) in order to check the disease in man it must be eliminated from cattle, and (3) that all cattle reacting to tuberculin were immediately dangerous to man and to other animals, were immediately availed of in the campaign against human tuberculosis. This led to extraordinary measures to eradicate tuberculosis from cattle. Health authorities assumed that tuberculin was sure in its response and that a single application would indicate all the infected animals in the herd tested. Working under these hypotheses the American system of control was legalized and many animals were tested and destroyed. The result was that many tuberculous herds were cleaned up completely but in others the disease reappeared and the efficiency of tuberculin was ques-

tioned. Difficulties of this nature were beginning to appear when a third important discovery was announced.

In 1898 Theobald Smith published the results of his researches into the relation of human and bovine tubercle bacteria. He found contrary to all previous statements that there were well marked morphological, cultural and pathogenic differences between them. In 1901 Koch read his famous paper in which he gave the world to understand that there was no relation existing between human and bovine tubercle bacteria. With that announcement there began one of the most intense investigations into the nature of a disease that has ever been recorded. For ten years a large number of competent men and women have been carrying on researches covering every conceivable phase of this great problem. The findings are quite unanimous in pointing out two distinct varieties of mammalian tubercle bacteria, one in man, the other in cattle, and in showing that children are sometimes infected with the bovine variety.

In addition to the question of identity or non-identity of tubercle bacteria, extended researches have shown the existence of many acid-fast bacteria widely distributed in nature that cannot be differentiated morphologically or by their staining properties, from true tubercle bacteria. Much, and more recently Schroeder, have described non-acid-fast organisms that produce a disease in Guinea pigs with lesions apparently not unlike those of tuberculosis. Thus each of the properties of tubercle bacteria that had long been recognized as possessing diagnostic value has been found to be insufficient in itself. This has made necessary a wider range of identifying tests, thereby greatly increasing the labor of the bacteriologist. These findings have brought clearly before us the phenomenon of the acid-fast group of bacteria and the difficulty in diagnosing tuberculosis from its etiology.

Further inquiries into the explanation for the action of tuberculin have tended to verify the theory of Eber as modified by Smith. This explains the oscillation between reaction and non-reaction in certain individual cases. According to this theory, tuberculin cannot cause a reaction where the progress of the

specific lesion is arrested, or where encapsulation exists. Thus it explains many of the seeming contradictions in the use of tuberculin and defines more clearly the conditions under which it can be trusted.

A further and equally valuable line of research has pointed out the class of tuberculous cattle that are spreading the virus and those that for the time being are not dangerous to others. Thus little by little the fuller nature of tuberculosis has been revealed until we have come to recognize that instead of dealing with a single question with a direct answer we are confronted with a series of complicated questions that depend for their answers upon vital and subtle forces which cannot be changed by the will or act of man.

The problem of control, however, is not restricted to the biological aspects of the disease. The practical side presents complications that are equally intricate and trying. The inefficiency of present methods for eliminating even advanced cases is shown by the constantly increasing number of tubercle bacteria in market milk. The steady demand for milk from the growing cities has revolutionized the former methods of handling milch cows. To keep up their milk supply throughout the year, farmers buy fresh cows and sell the dry ones. By reason of this a throng of living cattle is constantly passing through our dairy districts. Many of these animals are infected but they continue with the others until they become well advanced cases and spreaders of the virus before they are dispatched.

The American system of control which consists in tuberculin testing dairy cattle and slaughtering the reactors, was among the first to be inaugurated. It was started when the authorities believed (1) that human and bovine tubercle bacteria were identical and (2) when tuberculin was thought to give a reaction in all infected animals. It started as an official measure and carried indemnity from the state for the infected animals. Such payment was justified on the ground of public safety and equity to the owners. With slight modifications the system has continued in operation since its introduction. Could this method have been introduced soon after the infection occurred, it would have been

successful generally as it has been in certain localities and in single herds where all tuberculous cattle seem to have been identified and eliminated. Unfortunately in point of time it came so late that in many states there were too many infected animals for the available funds as well as too large a number of arrested cases, so that a single test could not detect them all. As a result, the official use of tuberculin has been and still is restricted to a small percentage of the cattle. In New York it is less than two per cent. annually. Local boards of health and milk commissions have required testing of perhaps 5 to 10 per cent. more. But even this is not sufficient to insure any great decrease in the number of tuberculous cattle. A very large part of the remaining ninety per cent. is not tested. In these tuberculosis is continuing to spread according to its own methods. There is more or less private testing, but where the laws are too stringent dairymen themselves are not active in finding the disease. The health authorities and often consumers will not permit the reacting cows to remain in the milking herd, although evidence of disease cannot be detected except with tuberculin. At the same time milk from herds that have never been tested and which often contain spreaders of the virus, as shown by an examination of the milk, is accepted.

A long and careful study of tuberculin has shown that with a reaction there is present an active tuberculous infection but its failure to react does not prove the absence of the disease.\* Ex-

\*Resolution 2, on tuberculin, passed by the International Commission on the Control of Bovine Tuberculosis, reads as follows:

1. That tuberculin, properly used, is an accurate and reliable diagnostic agent for the detection of active tuberculosis.
2. That tuberculin may not produce a reaction under the following conditions:
  - (a) When the disease is in a period of incubation.
  - (b) When the progress of the disease is arrested.
  - (c) When the disease is extensively generalized.

The last condition is relatively rare and may usually be detected by physical examination.

3. On account of the period of incubation and the fact that arrested cases may sooner or later become active, all exposed animals should be retested at intervals of six months to one year.
4. That the tuberculin test should not be applied to any animal having a temperature higher than normal.
5. That any animal having given one distinct reaction to tuberculin should thereafter be regarded as tuberculous.
6. That the subcutaneous injection of tuberculin is the only method of using tuberculin for the detection of tuberculosis in cattle which can be recommended at the present time.
7. That tuberculin has no injurious effect on healthy cattle.

perience has shown and theory explained that when infection exists either in the period of incubation or in a state of arrest tuberculin is not effective. These findings have answered many of the criticisms that have been raised against it. These are usually made by those lacking knowledge of when it can and when it cannot cause a reaction. Many of these important facts have been disregarded, and the system, while applied with good faith, has occasionally allowed infection to remain in the herd. In these the disease has sooner or later developed, and the herd has again become a center for dissemination. For this tuberculin has been unjustly blamed and not infrequently the integrity of the men who used it has been called in question. Unfortunately the use of tuberculin has come all too often to be considered synonymously with the slaughter of a herd and not as an agent of the greatest value in diagnosis.

Again the supposition that all reacting animals are immediately dangerous has been carefully investigated. Many examinations of milk, feces and saliva of infected cattle have been made to ascertain the extent to which open cases of tuberculosis exist without giving physical evidence of the same. This work is now in active progress but the results already reported\* indicate that spreaders of the virus can be detected in a very large percentage of cases on physical examination. Such men as Ostertag and Poels trace failure to detect the "spreaders" to a lack of skill on the part of the examiner. Although our system of testing and destroying the reactors has been right so far as ideals go, in general its results do not seem to have surpassed or even to have equalled the attainments of the methods based on a broader knowledge of the disease and the dissemination of its virus.

\*Moore and Boynton. N. Y. State Dept. Health, 29th Annual Report, i, 1908.

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Schröder. The Unsuspected But Dangerously Tuberculous Cow. Circular 118, U. S. Bureau of Animal Industry, 1907.

In Europe there are in operation at least three methods for the control of cattle tuberculosis. The Bang method, named after its distinguished author, Professor B. Bang, of Copenhagen, consists in eliminating all of the clinical cases; in testing the remaining cattle with tuberculin; separating the reactors from the well and keeping them for breeding purposes. In Denmark, however, the farmer is allowed to sell the milk\* from the reacting but clinically sound cows as well as the cows themselves and that country claims to hold the record of minimum tuberculosis in children. His method has been applied in over ten per cent. of the dairies of Denmark. The distinctive advantages of Bang's method are that it recognizes the property rights of the cattle owners; educates them in the nature of the disease, so that when their herds are finally freed from the disease they are able to keep them so; enables them to build up sound herds; and further it affords protection to the public.

The Ostertag method, generally applied in Germany, consists in frequent, thorough physical examination † of the cows and the removal of all suspicious cases. Tuberculin may or may not be applied. If it is used the reactors are not separated from the others. Its theoretical basis is that the disease can be detected by a careful physical examination before it has advanced sufficiently for the virus to escape. Ostertag states in his papers and he has told me personally, that the method, if rigidly carried out, will protect the milk from infection and eventually eradicate the disease from the herd. While it affords little or no protection for inter-herd control, it seems to be effective for intra-herd protection and eradication. Further it protects the consumers of milk in that it eliminates most if not all of the infected animals before they become spreaders.

The third European procedure is known as the Manchester method. It is followed more than any other in Great Britain.

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\*The milk that is taken to creameries and separated is always pasteurized before it is returned to the farm. Some of the people there, as in this country, buy milk from tuberculin-tested cows only.

† This method does not infer that infected cattle as a rule can be detected on physical examination. It is well known that but a small (3 to 5 percentage of infected cattle can be detected by this method.

It consists in making regular examinations of the market milk for tubercle bacteria. If they are found the herds from which the milk came are carefully examined and the cow or cows eliminating them are found and excluded. This method seems to deal with the immediately dangerous animals only. However superficial as a means of eradication it may seem, Delapin and Boyce report a far safer condition relative to tubercle bacteria in the market milk of Manchester and Liverpool than is indicated by the reports of similar investigations in our large cities.

After carefully studying these various methods, discussing them pro and con with their authors and examining the herds in which they are being applied, one cannot help but feel that in the eagerness to obtain at once absolute safety by eliminating all infected animals, the radical position taken in this country has tended to make haste slowly because it has purified but a few herds and left the others as they were. It would seem that the principle should be to eliminate first all cases that appear to be spreading the virus and to remove all of the infected animals from as many herds as possible. The methods suited to eradicate an acute destructive disease such as anthrax or one that might be introduced such as foot-and-mouth disease, are not applicable to a malady of such a chronic nature and so widespread and deeply rooted as tuberculosis is in the herds of this country. Again, with other cattle diseases the infected animals are practically worthless but with tuberculosis most of them retain for a time at least, their productive value.

Aside from its sanitary aspects the control of tuberculosis has an economic significance that cannot be overlooked. It was thought in Massachusetts and New York that the people would pay for and destroy all infected cattle. The records show that the maximum appropriations that could be secured for indemnity were woefully insufficient. Further, the method antagonized the owners and failed to bring about their cooperation, without which success is doubtful. The Bang method would be open to little or no objection in this country if dairymen could sell the milk from cows that have reacted to tuberculin but which

exhibit no physical evidence of the disease. At present our dairymen object to it because they have no way by which to dispose of the milk. Yet the milk from thousands of herds that have never been tested or even examined physically is accepted without question. Why is not milk from dairies containing reacting but clinically sound, *i. e.*, those in which lesions cannot be detected, cows quite as safe as it is from dairies where the cows have not been tested, in a country where tuberculosis is as prevalent among cattle as it is in this? The milk from infected cows is no less dangerous because they have not been tested, and conversely the milk from infected cows is a no greater menace after they are tested than it was before.

As the known facts relative to the nature and extent of bovine tuberculosis and the existing methods for its control are before us, it is clear that its biological problems are complicated by many perplexing administrative questions. Our task seems to be to adjust the disharmonies between existing regulations and the true nature of the disease. When the dairymen understand the facts and are given legal and moral encouragement to apply them, they will see to it that tuberculosis grows out of their herds more rapidly than it grew in. Instead of vainly looking for legislation to accomplish promptly beneficial results, let us direct our attention to the cattle owner and aid him in coming to an understanding of the true nature of his task. I deplore the sentiment so often expressed that dairymen are antagonistic to eliminating this or any other disease, for in most cases they are not. As a rule they are willing to reject all animals that their knowledge enables them to understand are diseased. The control of tuberculosis is largely an individual matter with the owners and they should be aided as much as possible. How they should proceed and what they should not be permitted to do in accord with our present knowledge have been clearly outlined in the report of the international commission on the control of bovine tuberculosis (see appendix for commission's plans). When all the beneficial results have been obtained that the suggestions in that report make possible, new knowledge on which to base new

methods will undoubtedly then exist to direct if necessary further procedure. I feel that any legislation that brings to the cattle owner hardships which are not called for by the true nature of the disease itself tends in the end to spread rather than check the infection. Knowledge and honesty are the two great potential factors in the control of bovine tuberculosis and these cannot be acquired by legislation.

### APPENDIX.

Appendix E\* of the Report of the International Commission on the Control of Bovine Tuberculosis—The Commission's Recommendations on Eradication—A Composite of the Methods of Bang and others.

The Commission after stating the known facts regarding the nature of tuberculosis and enumerating the principles to be observed in its prevention and eradication, recommends the following plan of procedure: It is recognized that in several points there are opportunities, in order to meet individual needs, to change or modify the directions herein given. It is understood, however, that whenever such modifications are made they should conform in the greatest detail to the principles laid down in the report of this Commission. The plan has for its purpose the conservation of the herd whenever that is possible.

The control of bovine tuberculosis involves a definite procedure under two distinct and different conditions, namely: (1) where a herd of cattle is free from tuberculosis and it is to be kept so, and (2) where one or more animals in the herd are infected and the purpose is to eradicate the disease and establish a sound herd.

#### PROCEDURE UNDER CONDITION ONE.

The prevention of tubercular infection in cattle, free from tuberculosis, consists simply in keeping tuberculous cattle or other animals away from the sound ones; in keeping tuberculous animals out of pastures, sheds or stables where the sound ones

\* Published in the AMERICAN VETERINARY REVIEW, October, 1910, as a part of the report of the International Commission on the Control of Bovine Tuberculosis.

may be kept. Healthy cattle should not be exposed to possible infection at public sales or exhibitions. Raw milk or milk by-products from tuberculous cows should not be fed to calves, pigs or other animals. Cars that have not been thoroughly disinfected should not be used for the transportation of sound cattle. Cattle that are purchased to go into sound herds should be bought from healthy or sound herds only.

#### PROCEDURE UNDER CONDITION TWO.

The eradication of tuberculosis from infected herds requires for conservation of the herd different procedures according to the extent of the infection. For a guide to the control of the disease, tuberculous herds may be divided into three groups, namely:

- I. Where fifty per cent. or more of the animals are infected.
- II. Where a small percentage (15 per cent. or less) of the animals are affected.
- III. Where a larger number (15 per cent. to 50 per cent.) of the animals are diseased.

In eliminating tuberculosis from infected herds the following procedure is recommended:

##### *Group I.*

Herds where a tuberculin test shows fifty per cent. or more of the animals to be infected should be treated as entirely tuberculous. The procedure here is as follows:

1. Eliminate by slaughter all animals giving evidence of the disease on physical examination.
2. Build up an entirely new herd from the off-spring. The calves should be separated from their dams immediately after birth and raised on pasteurized milk or on that of healthy nurse cows. This new herd must be kept separate from an reacting animals.
3. The young animals should be tested with tuberculin at about six months old, and when reactors are found at the first or any subsequent test—the others should be retested not more

than six months later. When there are no more reactors at the six months' test annual tests should thereafter be made. All reacting animals should at once be separated from the new herd and the stables which they have occupied thoroughly disinfected.

4. When the newly developed sound herd has become of sufficient size the tuberculous herd can be eliminated by slaughter under inspection for beef.

### *Group II.*

1. The reacting animals should be separated from the non-reacting ones and kept constantly apart from them at pasture, in yard and in stable.

(a) PASTURE. The reactors should be kept in a separate pasture. This pasture should be some distance from the other or so fenced that it will be impossible for the infected and non-infected animals to get their heads together.

(b) WATER. When possible to provide otherwise reacting cattle should not be watered at running streams which afterwards flow directly through fields occupied by sound cattle. The water from drinking trough used by infected animals should not be allowed to flow into stables, fields or yards occupied by sound animals.

(c) STABLE. Reacting cattle should be kept in barns or stable entirely separate from the ones occupied by the sound animals.

2. Calves of the reacting cows should be removed from their dams immediately after birth. Milk fed these calves must be from healthy cows, otherwise, it must be properly pasteurized. These calves should not come in contact in any way with the reacting animals.

3. The non-reacting animals should be tested with tuberculin in six months, and when reactors are found at the first six months, or any subsequent test, the others should be retested not more than six months later. When there are no more reactors at the six months' test, annual tests should thereafter be made.

All reacting animals should at once be separated from the new herd and the stables which they have occupied thoroughly disinfected.

4. The milk of the reacting animals may be pasteurized and used.
5. Any reacting animal which develops clinical symptoms of tuberculosis should be promptly slaughtered.
6. An animal that has once reacted to tuberculin should under no circumstances be placed in the sound herd.
7. As soon as the sound herd has become well established, infected animals should be slaughtered, under proper inspection.

### *Group III.*

Herds that come within this group should be dealt with either as in Group II, where the herd is separated, or as in Group I, where all of the animals are considered as suspicious and an entirely new herd developed from the offspring.

### GENERAL PRECAUTIONS.

In ALL cases animals that show clinical evidence of the disease should be promptly eliminated. They should be destroyed if the disease is evidently far advanced, if not, they may be slaughtered for food under proper inspection.

All milk from tuberculous cows that is used for food purposes should be thoroughly pasteurized. This means that it must be heated sufficiently to kill or to render harmless, any tubercle bacilli that may be present in it. For this, it is necessary to heat the milk for twenty minutes at 149° F. or for five minutes at 176° F. It is important that pails or other utensils used in carrying the unpasteurized milk should not be used, unless previously sterilized, for storing the milk after it is pasteurized.

When diseased animals are found, the stables from which they are taken should be thoroughly cleansed and disinfected. To accomplish this, all litter should be removed; floors, walls

and ceilings carefully swept and the floors together with mangers and gutters, thoroughly scrubbed with soap and water. Thorough cleaning before the application of the disinfectant, cannot be too strongly emphasized. After cleansing, the disinfectant should be applied. A five per cent. (5%) solution of carbolic acid, a 1-1,000 solution of corrosive sublimate or a four per cent. (4%) solution of sulphuric acid may be used.

When the stable can be tightly closed, formaldehyde gas properly used is reliable and satisfactory.

If tuberculous cattle have been kept in a small yard the litter should be removed, the surface plowed and the fencing and other fixtures thoroughly cleansed and disinfected.

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THIS is the closing paragraph of a two-page closely type-written letter from Dr. E. M. Bronson, secretary of the Indiana Veterinary Association, to the veterinary profession in his state who are not "within the fold" of the state association, and whom he desires to bring into that body, inviting them to the meeting in Indianapolis, January 10 and 11. This is published without the doctor's knowledge, but we trust not with his disapproval. Maybe he isn't a live secretary? And that is the type of men that are to receive the A. V. M. A. next August!

"Bring your Cora, Mayme, Anna, Margaret, or any of those good names that belong to the better half, that fills that hungry vacuum in a good man's soul, and let her see what a good looking lot of men veterinarians are. (Excepting, of course, the one she chose.) Start NOW and make your plans to COME.

When a bit of sunshine hits ye,  
 After passing of a cloud,  
 When a fit of laughter gits ye  
 An' ye'r spine is feelin' proud,  
 Don't fergit to up and fling it  
 At a soul that's feelin' blue,  
 For the minit that ye sling it  
 It's a boomerang to you.

—*With apologies to Capt. Jack Crawford.*

"Come on, let's 'Fling it' and be 'Boomerangs.'"

## THE ETIOLOGY OF INFECTIOUS ABORTION IN LIVE STOCK,\*

BY E. S. GOOD, HEAD OF DIVISION OF ANIMAL HUSBANDRY, KENTUCKY AGRICULTURAL EXPERIMENT STATION, LEXINGTON, KENTUCKY.

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The speaker does not presume to come before this body of learned men with a great deal of information concerning the important subject of infectious abortion. If I can add a small bit of knowledge to that already known, or confirm work already done, I shall feel highly gratified indeed. I believe I do not exaggerate when I say that contagious abortion causes an annual loss of millions of dollars to the stockmen of America and is a problem that has not received the attention that should have been given it by the scientists of this continent. The importance of this problem was first forcefully called to my attention while visiting the stock farms of England and Scotland in 1904, when I was told by a number of breeders of pure-bred cattle in that country that at some time in their experience as breeders, infectious abortion had visited their herds and caused heavy losses. Epizootic abortion has laid a heavy hand on the breeders of thoroughbred and standard-bred horses in the Blue Grass region of Kentucky, where keeping a large number of mares on the same farm and even in the same field has been a common practice. In seasons past, as high as seventy per cent. of the mares on some of these farms have aborted. For some reason, however, the mares of that section have, on the whole, been quite free from the disease during the past few years. This trouble has not been among the mares only, for it has and is visiting dairy farms in different parts of the state, and I understand that other states are having similar experience, especially among the cows.

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\*Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

## KINDS OF ABORTION.

Williams, in his text on *Veterinary Obstetrics*, divides abortion in domestic animals into three classes:

" 1. Sporadic or accidental abortion, in which, owing to the disease of, or accident to, the foetus or mother, the foetus may be expelled or in a state of disease which renders it impossible for it to live.

" 2. Enzootic abortion, due to some infectious disease of the mother, which brings about the death and expulsion of the foetus, as a complication of the maternal disease.

" 3. Infectious abortion, an infection of the foetus and its membranes which causes the death and expulsion of the foetus or its expulsion in a living and enfeebled state at any period of gestation from the date of conception to the normal completion of pregnancy, without directly inducing material evidence of the disease in the mother."

It is to this latter class of abortion that I am to confine my remarks. Infectious abortion has been known to exist among stock since the Middle Ages. The cause was then speculative, and the same is true to-day with a majority of the people. A large number of horsemen of the Blue Grass region believe this trouble is due to mares eating frostbitten grass early in the spring; the flushing of the system by eating too much succulent food; some declare it due to the malodor—*i. e.*, if a mare aborts in a field and the foetus and afterbirth are not removed at once and the place on the ground from which they were taken covered with dirt, the odor will of itself cause the remainder of the mares in the field to abort. Others claim that the cause is due to running horses on the same pastures year after year, while some breeders are quite positive that the trouble is the infection of mother and foetus with some micro-organism. The belief is on the whole more common among owners of herds of cattle than of studs of horses, that the disease is due to a microbe, and thereby of an infectious nature.

Although infectious abortion has been known among stock for a long time, there has been considerable variance in the dis-

coveries of different investigators as to the organisms producing this transmissible disease. It might be well at this time to give a brief review of some of the findings of a few of the most prominent investigators in this field during the last thirty years.

Franck, Brauer, Galtier, Nocard, and other workers produced abortion experimentally in cows by inoculating some of the afterbirth of an aborting cow into the vagina of pregnant cows, or by feeding the material to them.

In 1886, Nocard carried out the first extensive investigation of a bacteriological nature with reference to this disease. He recognized a short bacillus and a micrococcus as being most often associated with the fœtal membranes of an aborting animal. He was unable, however, to produce abortion experimentally with pure cultures of these organisms.

Ostertag, of Germany, has been one of the most prominent foreign workers of this disease among mares. He found in the heart blood of the fœtus, in the thoracic cavity, and in the intestinal tract, short streptococci which usually grew in pairs and readily stained by Gram's method. He also secured this germ from the fœtal membranes. He was able to produce abortion experimentally by injecting a culture of this germ into the jugular vein of mares. Considering the fact that Ostertag was able to secure this organism from the fœtus and produce abortion experimentally leads me to believe that he secured the germ that was causing the disease among the mares of his special district at least.

Law and Moore, of Cornell, and Chester, of Delaware, have been prominent investigators who have given publicity to their results in this country. These gentlemen have found a type of the colon bacillus in the liquid taken from the uterus and in the fœtal and maternal cotyledons.

In 1887, Bang and Stribolt, of the Royal Veterinary College of Copenhagen, Denmark, announced that they had discovered a germ associated with infectious abortion in cows that was able to produce the disease when inoculated intravaginally or intravenously into pregnant cows. As far as I know, these gentlemen

went at the problem in a different manner than any previous investigator, in that they slaughtered a cow showing symptoms of aborting and removed the unopened uterus to the laboratory, where it was opened as aseptically as possible. An abundant grayish yellow, odorless exudate was found between the ovum and the inner wall of the uterus. Upon standing, this exudate separated into two layers, a reddish yellow serum above and a grayish yellow, partly solid layer below. Preparation of this exudate stained with methylene blue revealed numerous very small organisms that resembled, under low power of the microscope, cocci, but on examining them under a higher power they found that they were short, thick bacilli containing one, two and three granules. After a great deal of effort these gentlemen were able to cultivate this organism on serum-gelatin agar, the germ developing in a particular zone of the media, beginning about 5 mm. beneath the surface of the medium and extending downward 10 to 15 mm. They concluded that this bacillus was neither an aerobe nor an anaerobe in the ordinary sense. Their inoculation experiments were affirmative.

The speaker began his bacteriological investigation of infectious abortion in live stock at the Kentucky Agricultural Experiment Station in 1907. The intention at first was to work mainly with the disease in mares, but I learned from experience on account of a definite breeding season that mares usually abort during January, February, March and April. Of course, they abort at other times of the year, and at times soon after conception, but this is the exception and not the rule. Finding that the investigation of this disease with the mare was limited to a few months of the year, we began a study of the cow as well. Cows on dairy farms are bred at different times of the year, and as a consequence, abortions are liable to occur in any month. We at once turned our attention to the isolation of the bacillus discovered by Bang and Stribolt, but during the first three years of our investigations we were unable to isolate it, and came to the conclusion that if it existed in this country it was not causing the trouble with the herds we were examining.

On October 18, 1907, Dr. A. D. Piatt, then of Lexington, Ky., brought the fœtus of an aborting mare to the laboratory. This mare aborted twins; the first fœtus was passed in the forenoon, the last one about 2.30 in the afternoon. The veterinarian was on the ground half an hour after the last fœtus came. He removed the afterbirth as aseptically as he could and brought it, together with the fœtus, to the laboratory. The fœtus was covered with the amnion, which was pink in color and closely invested the fœtus. Distributed rather thickly over this membrane were seen small, yellowish, gritty nodules about the size of a pea. On staining the contents of one of the nodules it was seen to be packed full of a small diplococcus. Here was a case that in all probability could not have become contaminated with outside bacteria, so far at least as the small nodules were concerned. Cultures were grown on serum-agar. On November 13, 1907, this veterinarian brought the afterbirth of an aborting cow to the laboratory. This cow had carried her calf about five months. The placenta was quite badly congested but showed no evidence of decomposition. It was also covered with little whitish nodules, ranging in size from a No. 6 shot to a small pea. Some were nearly round, while others were irregular in shape. Upon staining these nodules they were found to be packed with a small diplococcus measuring about three-fourths of a micron and having the same morphology as that obtained from the covering of the fœtus and placenta of the mare. In some respects this organism resembled a very short bacillus in pairs, and it stained by the Gram method. This organism grew aerobically in serum-agar, although it increased in size from the original culture. Two of the large nodules were macerated in 4 c.c. sterile water, and 2 c.c. of the dilution inoculated intravaginally into one pregnant guinea pig, and 3 c.c. inoculated intraperitoneally into another pregnant guinea pig. Four days afterwards the pig receiving the inoculation intravaginally gave birth to three dead pigs, while the other sow carried her pigs full time and delivered them alive. While cleaning the refrigerator, test tubes containing cultures of this organism were acci-

dentally thrown away. The loss was not considered great at the time, as I thought we would soon be able to secure similar cultures from future abortions, but from that time to this we have not discovered a germ connected with abortion corresponding exactly with the one just described.

In one instance we found the foetal membranes and amniotic fluid of an aborting cow teeming with the *Staphylococcus pyogenes aureus* in pure culture. Although skillful medical attention was given to this cow she became weaker and weaker, and when it became evident that she would die, she was slaughtered and posted. Her uterus was a mass of pus, as was the case with numerous internal organs of her body, the *Staphylococcus pyogenes aureus* being the invader. It is evident that this organism invaded the uterus and caused the expulsion of the foetus and afterwards became generalized and would have killed the cow. I speak of these cases to show that other bacteria than those specially noted in literature as causing epizootic abortion may at times infect the uterus, causing the death of the foetus.

During the summer and fall of 1910 and early winter of 1911, we often found a diplococcus in the afterbirth of the cow and umbilical cord of the aborted foetus. It was while bending every effort to secure the afterbirth of an aborting cow as aseptically as possible, endeavoring to determine whether the diplococcus was the only organism connected with the foetal membranes and which resembled morphologically the germ isolated from the mare and cow in 1907, that we obtained a culture of the "Abortus-bacillus" discovered by Bang and Stribolt of Copenhagen, Denmark, in 1887. By exuding a purulent yellowish mass from the vagina, together with a swollen vulva and increased milk flow (was being milked at the time), the cow was marked as one that would abort. When the cow aborted everything was in readiness. She was taken to the open field for the removal of the afterbirth, and as the ground was moist there was no dust flying to contaminate the material as it was taken from the cow and placed in sterile jars. The cow was washed with a disinfectant from the hook points backward.

The veterinarian washed his hands thoroughly with soap and water, cleaned his finger nails, then washed his hands in 1 to 500 bichloride of mercury. The first material taken from the cow was discarded. Three or four cotyledons were placed in sterile jars. Large pieces of compact pus were also taken from this cow and put in separate sterile jars. Streaks of these different parts were made on serum-agar, as is customary in streak dilutions. These Petri dishes were put in a partial vacuum by extracting a part of the air with a vacuum pump. It had previously been determined that this Novy jar slowly leaked air. For instance, if the vacuum measured 27 inches of mercury at the beginning, it would measure from 3 to 5 inches at the end of six days. My intention was that if the Bang bacillus was present in any plating, that it would in this wide range of diminished atmospheric pressure find a definite pressure of oxygen in which it would grow. These plates were incubated for six days. As was shown by controls, some of the serum used was contaminated. One plate which had been streaked with a cotyledon had two organisms growing upon it, one the diplococcus in question, growing on limited areas, the other the "Abortus-bacillus" Bang, growing scantily on a considerable part of the plate. The contaminated serum was a blessing in disguise in that the multiplication of the germs it contained aided in reducing the oxygen in the jar to just the pressure needed to secure some growth of the bacillus mentioned. I have since grown this bacillus by the same procedure, though the method is not practicable.

Learning that MacNeal and Kerr, of the Illinois Experiment Station, had succeeded in isolating the "Abortus-bacillus" Bang, I went to that institution to compare cultures and found them to be identical. Dr. MacNeal used the Nowak method of plating in obtaining his cultures. The method consists in lowering the pressure of oxygen necessary for the "Abortus-bacillus" to grow by means of *Bacillus subtilis*, allowing one square centimeter of surface culture of the *subtilis* to each fifteen cubic centimeters capacity of the jar in which it is grown. We find

that the Novy jar for growing anaerobes is admirably adapted for this work. I might say that Nowak has furnished by this method the only practicable plate method of isolating the germ from the afterbirth where it is contaminated. The method is, in short, to streak a piece of cotyledon or other part of the afterbirth over two or three Petri dishes in succession as is ordinarily done in streak dilutions. The plates are then incubated at 37° C. for twenty-four hours in the air. At the end of this time, if the streaks have been successfully made, there will be some clear places on the plate. These clear places are marked with a wax pencil or ink. The plates are then incubated for three days, as mentioned above, at the end of which time the transparent colonies of the "Abortus-bacillus" Bang may have appeared in the clear places on the plate. I find that plain 2 per cent. agar is a very good medium on which to grow this germ if correctly standardized for this germ. We standardize it neutral (faint pink) to phenolphthalein.

On March 25, 1911, a heifer that had previously aborted in the herd from which we had obtained the *Bacillus abortus* was giving every symptom of aborting. She was confined by herself and during the night aborted an eight-months-old fetus. This calf was too weak to stand and died the next morning. Cultures were made from the liver, stomach and intestinal contents of the calf. Although we tried to observe aseptic precautions, three different germs were obtained in our plating, one of which, however, as far as morphology was concerned, was identical with the "Abortus-bacillus" Bang. In the meantime, our attention was called to an aborting herd of cows some miles from Lexington. I immediately visited this farm and found up to that time eighteen cows out of forty had aborted during the year. The manager of this herd had had abortion in his own herd at one time and for two years lost nearly every calf, and consequently recognized this type as an infectious type of abortion. We have examined four afterbirths since that time from aborting cows in this herd and have obtained pure cultures of the "Abortus-bacillus" Bang in two cases and in mixed culture in one case. We also killed and posted a calf two weeks

of age in this herd that was aborted at eight months and lived, though very weak. Platings were made of the liver, stomach and intestinal contents. The results were negative.

On July 9 I was notified that a heifer of the first-named herd had aborted. She had been bred on the first of January. While this cow was being milked, the milker noticed that she maneuvered as if she wanted to lie down. As soon as the milking was completed this cow aborted a male foetus. I at once thoroughly scalded a pail, and after washing the foetus with hot water, put it in the pail and took it to the laboratory. I meant to take every precaution this time to prevent outside contamination, so washed the foetus with 95 per cent. alcohol and opened it up under aseptic conditions. We found all the internal organs apparently normal with the exception of the peritoneum, kidneys and one lobe of the liver. The kidneys appeared enlarged and were highly congested, being nearly black in color. Each kidney measured two by two and one-half inches. The parietal peritoneum showed local areas of congestion. The quadrate lobe of the liver was very much inflamed. The kidneys, liver, small intestine, stomach and umbilical cord (at entrance to foetus) were seared and opened with a sterile lance. One or two small loopfuls of material were taken from each organ and streaked on numerous plates. Nothing but colonies of the "Abortus-bacillus" Bang were obtained in any dish with the exception of the plating of the umbilical cord, which was highly contaminated. There were, however, a few clear places on one plate of the umbilicus on which could be seen colonies of the bacillus. The colonies of "Abortus-bacillus" on most of the plates were so numerous as to be confluent. Taking into consideration the small amount of material plated, and the abundant growth secured, it was evident that this bacillus must have been exceedingly numerous in these organs. The bacillus was also identified in the different organs by stains.

The afterbirth of foetal membranes were removed the next morning by Dr. Graham, and he reported her uterus to be extremely sensitive, showing typical symptoms of metritis. Platings

were made of the cotyledons and injection of bits of cotyledons were administered subcutaneously into a pregnant guinea pig. The pig died over night and upon being posted was found to be infected with the colon bacillus. She had, however, aborted one pig before dying. The plating from the cow revealed the colon bacillus on most of the plates, and on only one plate, and that on a small area, did I find colonies of the Bang bacillus. Though this cow was given every attention, receiving daily vaginal douches, she exhibited on the ninth day after calving symptoms of septicæmia, and on the 23d of July, two weeks after calving, died. Dr. Graham posted the cow and pronounced her death due to metro-peritonitis.

We have not, as yet, tried our culture on pregnant cows. So far we have inoculated five pregnant guinea pigs subcutaneously with pure culture of this organism. Four of these pigs aborted. Two of the pigs inoculated with one culture gave premature birth to dead pigs after an interval of eight to eleven days respectively from the date of inoculation. One delivered pigs at full time. Two pigs inoculated subcutaneously with a pure culture obtained from another aborting cow went thirteen to twenty-one days respectively before aborting. I thought they would surely deliver their pigs at full time. The uterus of both of the pigs showed abscesses at their placental attachments. The covering of abscess was somewhat tough—cartilaginous. The sow that went twenty-one days passed four fœti, two of which were apparently fully developed. The other two possessed no hair and were considerably shrunken; in fact they were partly mummified and evidently had been dead for several days before expulsion. Streaks of cross sections of these abscesses of the uterus of the mother pig on plain agar looked, after being inoculated, as if one had smeared the plates with a pure culture of the bacillus, so plentiful was the growth. We also obtained cultures of the "Abortus-bacillus" from the pus at seat of inoculation in each case from the cotyledons of each pig, and from an ovary in one case. We have never been able to secure the bacillus from the fœtuses, nor from the liver or heart blood of the mothers. MacNeal did secure cultures from the fœtuses of guinea pigs in

several instances and from the heart blood of the mother in one instance.

On June 28 we inoculated the growth on three agar-serum tubes, diluted in 20 c.c. of bouillon, in the ear vein of a pregnant sow weighing two hundred and twenty pounds. On July 8 this operation was repeated by injecting into her ear vein the growth on twelve inclined tubes of agar diluted in physiological salt solution. Seventy-five cubic centimeters of this material were injected at this time. There was no reaction to speak of with the exception that the sow refused to eat for two days. On July 31 it was noticed that the sow was in heat. It is not certain that this sow was pregnant, as she was purchased, though she gave every evidence of being well along with pig when inoculated. On August 7 this sow was slaughtered and platings made of the uterus, ovaries, kidney and liver. The results were negative.

Dr. Bang was able to produce abortion in cows by intravaginal injections of pure cultures of this bacillus, the incubation period being from seventy to eighty days after the first inoculation. He was able to produce the disease in a mare by introducing intravenously a pure culture of the germ. Incubation period was twenty-eight days. MacFadyean and Stockman, of Great Britain were able to produce the disease in eight cows with the intravenous injection of the virus and pure culture. They were also able to produce the disease by feeding in three out of four cases.

The *Bacillus abortus* has now been isolated by Bang and Stribolt, of Denmark; Preiz, of Hungary; Nowak, of Austria; MacFadyean and Stockman, of Great Britain; by Zwick, of Holland; MacNeal and Kerr, of Illinois Experiment Station, and by the writer, of the Kentucky Experiment Station. Considering the different countries in which this peculiar germ has been found associated with infectious abortion, it looks quite conclusive that it is the cause of some of the outbreaks of the disease among cows, if not the universal cause.

Up to the present time we have no definite results of our own to give relative to the etiology of infectious abortion in

mares. As I said in my introduction, the disease has not been so prevalent among mares in our section of the country during the past three years as was formerly the case, hence we have found it somewhat difficult to get specimens.

Dr. Surface of the department was able to secure a bacillus from a stud of aborting mares this spring (where something like twenty-five out of forty mares aborted), which, when inoculated subcutaneously into a pregnant guinea pig, would cause it to abort. He was able afterwards to secure the germ from the uterus and placenta of the pig. The incubation period was about the same as for the "Abortus-bacillus" Bang. Dr. Surface is now abroad on a leave of absence studying the disease from the standpoint of the European.

I investigated an outbreak of the disease in a small stud of jennets early this summer. There were five jennets at this place and every one aborted. A short bacillus was obtained in pure culture from the heart, liver, spleen, stomach, intestines, kidneys, uterus, ovaries and the lymphatic system of a nearly developed foetus (female) of one of these jennets. This foetus was taken to the laboratory as soon as it was dropped—in fact the veterinary surgeon aided in its delivery. I have not as yet completed a thorough physiological study of this organism nor have any inoculation experiments been conducted on any animal with this germ.

In studying the cases of both of these studs our technic was the same as used in isolating the "Abortus-bacillus" Bang, but in no instance did we find that organism. We are in no position at the present time to say that either of the bacilli isolated from the mares or jennets is the cause of the disease among horses in our region.

There is no germ that I know of which at the present time is accepted to be the universal cause of the disease among mares.

I wish to acknowledge valuable aid received from time to time in these investigations from Prof. T. R. Bryant and Dr. Robert Graham, both of the Department of Animal Husbandry of the Station.

## HOG CHOLERA.

### V. B. VACCINATION (*Virulent Blood*).

BY M. H. REYNOLDS (1), EXPERIMENT STATION, UNIVERSITY OF MINNESOTA.

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A preliminary report of this work was published as a claim for priority in the AMERICAN VETERINARY REVIEW for November, 1910. The principles involved in this, rest on the discovery that very young pigs from sows that have undergone the processes of active immunity are, as a rule, highly resistant to cholera and that this is rapidly lost as the pigs grow older.

It has been well known in a general way that hogs from previously immune dams have varying degrees of natural immunity and that most of them will die under exposure or inoculation, although perhaps showing some resistance.

So far as the writer knows, it has not been previously shown:

1. that *very young* pigs from immune sows are, as a rule, highly immune;
2. that this is gradually lost in most cases; and
3. that this temporary immunity can be made comparatively permanent by inoculation with simple, unmitigated virus if given during this early immune period. It is obvious that this may be done at an insignificant cost.

We find that after about five weeks of age this inherited immunity cannot be relied on, although some pigs retain immunity sufficient to resist direct inoculation until 12 or 14 weeks old.

In our first preliminary report, we were unable to give any information as to whether sows immunized by Dorset-Niles serum-virus method would produce highly immune pigs. During the present year we have accumulated some data on this subject, a summary of which will be given here.

At the time of our earlier report we had insufficient data upon which to base statement whether young sow pigs receiving V. B. Vaccination, would themselves produce pigs of sufficient immunity for this process. We now offer some data to cover this point, which is particularly gratifying.

Experiments with young pigs from susceptible sows have been limited but indicate that they have no unusual resistance on account of age, but are very susceptible.

We keep our virus at the highest possible grade for our Dorset-Niles serum work by continually passing through light shots. Such virus has been purposely used in our V. B. Vaccine work. It is reasonable to suppose that if virus of lower grade, easily produced, had been used, our percentage of losses under V. B. Vaccination might have been still smaller. One-half a cubic centimeter, the dose which these young pigs received, is a very large dose of high virulence serum for such small and young pigs. In several instances litters have been injected with 5 c.c. of this virus at from 5 to 7 days old, without harm. Smaller dose or less virulence may give permanent immunity, with still less risk and loss.

Everyone familiar with the raising of young pigs knows that an important proportion of young pigs die under any conditions of feed and care. A portion of the young pigs reported here as dead were examined post-mortem. Conditions in other cases were such that a careful post-mortem was impossible. It was not practical for us to attempt inoculation of susceptible pigs from each V. B. pig that died. Some of the cases examined post-mortem were evidently cholera.

The reader will kindly remember that blood of the highest virulence was used on these little pigs in this preliminary work. Blood of very much lower virulence will probably produce all needed and permanent immunity and will probably be used in practical field work. Bear in mind also that our exposure immune sows were taken more or less at random as to their periods since infection.

## EARLY WORK—UP TO JANUARY 1, 1911.

The reader is asked again to bear in mind, while considering the following data, the high general mortality risk with very young suckling pigs and their small value when lost as compared with the older hogs usually immunized by other methods.

Brief mention of our earlier work appeared in the *AMERICAN VETERINARY REVIEW*, Vol. XXXVIII, No. 2. This is included here in the following later statement.

Up to January 1, 1911, we gave V. B. Vaccination to 107 pigs 6 weeks old and under, from 25 exposure immune dams and V. B. immune dams, with a total loss of 8 pigs from pigs from probable vaccination cholera (2).

*Exposure immune dams.*—Eighty-nine pigs from about 22 exposure immune dams were inoculated with .5 c.c. virus with a loss of 8 pigs (3), which may be reasonably charged to the vaccination.

During 1910 we studied the immunity held by young pigs of greater age. In this work we inoculated 16 pigs from 5 exposure immune sows. These pigs covered in age 7 to 14 weeks. There died 9, mostly plain cases of cholera. This, as well as later experience, indicates that V. B. Vaccination should not be used for pigs over 5 weeks old.

*V. B. Vaccine sows.*—This means sows that had been given treatment by our method when little pigs the year before. During this same period eighteen pigs under six weeks old from 3 such sows were inoculated with no losses.

*From Exposure Immune Dams.*

| Age, Days. | Number of Pigs. | Dose of Virus. | Results.                  |
|------------|-----------------|----------------|---------------------------|
| 5          | 7               | .5 cc.         | No losses (4).            |
| 9          | 14              | .5 cc.         | 2 died; pneumonia.        |
| 12         | 3               | 1.5 cc.        | 1 died, probably cholera. |
| 14         | 4               | .5 cc.         | No losses.                |
| 21         | 9               | .5 cc.         | 2 died; probably cholera. |
| 28         | 45              | .5 cc.         | 5 died; probably cholera. |
| 35         | 3               | .5 cc.         | 1 died; cholera.          |

*From Exposure Immune Dams—Continued.*

| Age. Days. | Number of Pigs.                | Dose of Virus. | Results.  |
|------------|--------------------------------|----------------|---|
| 42         | 4                              | .5 cc.         | No deaths.  |
| 45         | 4                              | .5 cc.         | 2 died; one developed chronic cholera; stunted in growth; finally recovered.                        |
| 56         | 3                              | .5 cc.         | 2 developed chronic cholera; finally recovered.   |
| 72         | 6<br>(4 weaned;<br>2 unweaned) | .5 cc.         | 2 weaned and 2 unweaned died of chronic cholera. The remaining two weaned pigs were very unthrifty. |
| 84         | 2<br>(1 weaned;<br>1 unweaned) | .5 cc.         | Both died after several weeks; chronic cholera.   |
| 98         | 1                              | .5 cc.         | Chronic cholera; died after three weeks.  |

*From V. B. Immune Dams.*

| Age, Days. | Number of Pigs. | Dose of Virus. | Results.   |
|------------|-----------------|----------------|------------|
| 14         | 11              | .5 cc.         | None sick. |
| 21         | 7               | .5 cc.         | None sick. |

*Death Rate by Weeks of Age. Pigs From Supposedly Immune Dams of Both Classes Combined.*

| Age, Weeks.  | Number of Pigs. | Results.                      |
|--------------|-----------------|-------------------------------|
| Under 1 week | 7               | No losses.                    |
| 1 to 2       | 32              | 1 died; probable cholera (5). |
| 2 to 3       | 16              | 2 died; cholera.              |
| 3 to 4       | 45              | 5 died; cholera.              |
| 4 to 5       | 3               | 1 died; cholera.              |
| 5 to 6       | 4               | None died.                    |
| 6 to 7       | 4               | All sick; 2 died.             |
| 7 to 8       | 3               | 2 sick; none died.            |
| 8 to 9       | 6               | 4 died.                       |
| 11 to 12     | 2               | Both died.                    |
| 13 to 14     | 1               | Died.                         |

*Summary.*—So far our results have been quite satisfactory with pigs under 5 weeks of age. Apparently the younger the better, down to 1 or 2 weeks.

An early temperature reaction with pigs given V. B. has thus far seemed to indicate good results. Retarded temperature reaction seems to indicate a tendency to develop chronic cholera.

#### DATA, 1911 (6).

During 1911 we gave V. B. Vaccination to 183 pigs *four weeks old and under*, from 31 sows of all three classes, and lost 15 pigs all from two litters; nine from one sow; six from the other, in each case, the entire litter (7). See explanatory note concerning "Old Yellow Sow." Twenty-nine of thirty-one sows produced pigs all of which took V. B. Vaccination perfectly.

Our 1911 work is grouped as follows:

*Exposure immune sows.*—During the year of 1911 we vaccinated 30 pigs from five exposure immune sows and lost nine. Please note that all of these nine were from the one *old* sow ("Old Yellow Sow") subsequently mentioned and explained. With this one litter excluded, there would be no losses for pigs from exposure-immune sows.

*V. B. Vaccination sows.*—From nine V. B. sows forty-three pigs were inoculated with *no* deaths. Note there were no losses in either 1910 or 1911 and none up to date, among pigs from sows immunized by our V. B. method.

*Dorset-Niles sows.*—From seventeen sows made immune the year before by the Dorset-Niles serum-virus method we inoculated 110 pigs and lost six, of which five were from one sow and had a doubtful diagnosis. These five pigs included as having died under V. B. Vaccination, were in yards of a certain city garbage feeder. Autopsy gave a questionable diagnosis of cholera. Soon after the same owner had other young nursing pigs from immune sows, sick in a very similar way—pigs that had not received vaccination, and being from immune sows, were too young to contract cholera by exposure even if the V. B. pigs previously sick had had cholera.

There is grave doubt therefore, in this and other cases, as to whether the little pigs died from cholera as result of V. B. Vaccination. Pigs that died from *known* causes other than cholera

have been excluded. *All reasonably doubtful cases have been included, however, as deaths from cholera and charged to V. B. Vaccination.*

The showing for pigs from V. B. sows is particularly gratifying and indicates that hogs receiving this V. B. Vaccination are very highly immune at the end of a year as compared with sows immunized by other processes. This is estimated by the degree of immunity possessed by their pigs at birth, which we now believe to be a very reliable index as to the relative immunity of the dams. This is illustrated by a case previously mentioned.

In one case we had it occur that a sow produced pigs that were sufficiently susceptible to die under six weeks of age from V. B. inoculation. The sow's immunity was then reinforced by inoculation with virus. She became ill and was off feed for some days but recovered, showing rather low immunity. Her next litter proved highly immune under V. B. Vaccination.

In another case we had an old exposure immune sow ("Old Yellow Sow") which produced two successive litters of pigs which stood V. B. Vaccination perfectly. A third litter was vaccinated by this method and all nine pigs died. The old sow's immunity was then reinforced and the next litter all stood V. B. Vaccination perfectly. This seems to indicate that old hogs that have been at one time highly immune, may be slowly losing immunity, as we would reasonably expect.

We have given some study to the question as to whether the little pigs' immunity was due to inherited immunity or whether it was receiving protection from the mother's milk. In this we had some interesting experiences which will be reported later. Our work along this line shows as far as it has gone that nursing has little to do with the pig's immunity.

In the course of this work we have had various interesting side experiments, *e. g.*, sow 202 weighing about 45 pounds, was treated with a large dose (115 c.c. serum) from little pigs 1½ days old, from an immune sow. At the same time she received 2 c.c. of highly virulent virus. Sow 202 was one of a carefully

selected lot of pigs purchased for our regular serum testing and was presumably susceptible. She remained in perfect health. Her vaccination was given on August 12, 1910. On July 15, 1911, we inoculated six pigs four weeks old, from this sow, with  $\frac{1}{2}$  c.c. of highly virulent serum, with the result that the pigs all took this V. B. Vaccination perfectly, showing not only a high degree of immunity for themselves but also a high degree of immunity for the dam.

We are not putting our V. B. Vaccination before the profession as something settled. We are not yet advising general use even where exposure immune or serum-simultaneous immune sows are plentiful as they will be in many sections of the corn belt next spring.

Future experience may show that immunity conferred by this method upon very young pigs may not be uniformly as permanent as our results up to date would seem to indicate. In that case it may only be necessary to revaccinate by this simple and inexpensive method when the pigs reach some, as yet undetermined, age which must, of course, be within the immune period.

This method has not yet made good in general field trials with different strains of hogs under different climatic conditions and different systems of feeding. All that we are doing so far is reporting frankly our results in preliminary trials and saying that we are hopeful.

*Possible field of usefulness.*—Our idea of this may be shown in a suggestion to the effect that there will be many places throughout the corn belt next season where exposure immune sows will be plentiful. If actual field trial on large scale in many sections confirms the work of two years and a half as here reported, then owners of such sows can immunize little pigs next spring and their descendants in turn generation after generation, at an expense that will be insignificant. The cost of  $\frac{1}{2}$  c.c. of virulent serum is practically nothing.

We can hardly expect that the general run of farmers owning a few immune sows will take the pains to continue their stock immune to cholera even if it could be done at such insig-

nificant expense. On the other hand, intelligent farmers who carry a heavy investment in hogs, and breeds of valuable pure breeds, could continue their stock immune at a trifling expense. It seems probable that such men would do so if the virus and veterinarians to use it were available.

If future experience confirms our expectations, then V. B. Vaccination may play a helpful part in the future control and eradication of hog cholera.

Our work in the past nearly three years has progressed to such an extent that we now feel justified in beginning more extensive field trials and are planning to do so at several points in the state during the coming year.

*Field trials.*—The writer would like to correspond with a few veterinarians who have something of an experimental turn of mind and who are located in sections where cholera has prevailed during the present season. We should like to arrange for field trials of V. B. Vaccination under as different conditions as possible.

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1. Attention is called again, as in our preliminary report (see AMERICAN VETERINARY REVIEW of November, 1910), to the fact that the original discovery of the underlying principle should be credited to the writer.

Reynolds and Beach planned the later experiments together. To Dr. B. A. Beach belongs the credit for carrying out the later experiments as planned, for the keeping of records, and for original suggestions concerning the conduct of the work and interpretation of results.

2. This does not include one little runt, which died, cause unknown, and which should not have been included in the experiment. It does not include two pigs which died, with a diagnosis of probable pneumonia other than hog cholera, or one pig which died after receiving 1.5 c.c. virulent serum; i. e., three times the standard dose of .5 c.c.

3. Not counting one entire litter of seven pigs from a sow of uncertain history.

4. One weakling died during the experiment which should not be counted.

5. Received 1.5 c.c. virus, three times the usual dose.

6. An experiment station bulletin is being prepared for early publication. This will give methods, work done and experimental data in full.

7. One of these 15 pigs may have belonged to a third dam. We could not be absolutely certain.

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THE INDIANA VETERINARY ASSOCIATION will meet at the Hotel Denison, Indianapolis, January 10 and 11, and a large attendance is anticipated.

## EXPERIMENTS IN ERADICATING TUBERCULOSIS FROM A HERD.\*

BY PROF. NELSON S. MAYO, M.S., D.V.S., VIRGINIA POLYTECHNIC INSTITUTE,  
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There is no doubt but that bovine tuberculosis is one of the most serious and at the same time one of the most difficult diseases that live-stock sanitary authorities have to deal with. Because of the slow, insidious character it is difficult to impress upon the public the seriousness of the disease, and without a public sentiment to support them it is almost impossible for state or local sanitary officials to make any progress, as those of you who have tried, even with the best of measures, can testify. Up to the present time the hypodermic injection of tuberculin has been the only method that has given any results in the control or eradication of tuberculosis. With the use of tuberculin there has developed two factions, one of which claims vigorously that tuberculin is of no value but actually a serious source of danger when injected into healthy or tuberculous animals. The other faction holds that tuberculin is the only satisfactory means of detecting bovine tuberculosis that there is no danger in its use; that it is practically infallible; and that it is a simple matter to eradicate tuberculosis from a herd by using tuberculin once or twice. Such seems to be the general situation to-day. It is unfortunate in many respects because bias or prejudice seriously hinders the accumulation of actual facts regarding the use of tuberculin.

During the past twenty-two years the writer has been connected with four different agricultural colleges, in each of which efforts have been made to eradicate tuberculosis from the herd. The difficulties encountered have been greater than was antici-

\* Presented to the United States Live Stock Sanitary Association, Chicago, December, Jan. 10-11, 1912.

pated, and in some instances, after two or three tests with elimination of reactors and disinfection, when we were laboring under the impression that tuberculosis was eradicated from the herd, we were chagrined and disappointed to have a serious outbreak without apparent cause. I think that we who advocate the use of tuberculin in eradicating tuberculosis err in conveying to the cattle owner the impression that it is a comparatively easy task to free a seriously infected herd from this disease. We must be exceedingly cautious about declaring a herd free when we get no reactions. The following brief history of tuberculosis in the herd of the Virginia Polytechnic Institute, while possibly not typical, is not greatly different from other seriously infected herds, where a persistent and conscientious endeavor has been made to eradicate tuberculosis.

The herd of cattle at the Virginia Polytechnic Institute was composed largely of pure-bred cattle of the leading beef and dairy breeds, comprising Shorthorns, Herefords, Aberdeen-Angus, Holsteins, Jerseys, Guernseys, and some grades. The Polytechnic Institute is located on the crest of the Allegheny Mountains, 2,200 feet above sea level, in a fine blue grass region, where the winters are comparatively mild and the summers pleasant. The herd has been kept under better sanitary conditions than the average herd.

Previous to 1901 the college herd was housed in the old farm barns of the Solitude Plantation owned by the V. P. I., but in 1901 new, commodious, well-lighted and ventilated barns were built in another location and the herd transferred to them. The herd has been confined in stables but little. During the winter the cattle are stabled nights and during inclement weather, spending the days in yards about the barns. In the summer the dairy cows only are placed in the stables for feeding and milking twice daily. The beef cattle and those not giving milk are in pasture all summer.

The herd was first tested with tuberculin by Dr. E. P. Niles, veterinarian, Virginia Experiment Station, in 1893. Fifty-four animals were tested. One reacted and was killed. Two were

considered suspicious and were retested two weeks later, did not react, and were left with the herd.

A "scrub" milch cow purchased after this test and kept with the college cattle died from acute tuberculosis the next spring. The herd was retested with tuberculin in June, 1894, with six reactions. The reacting animals were separated and retested one month later and only one reacted. Another soon showed physical symptoms and three of the reactors were destroyed. The other three were isolated and were probably retested and reactors destroyed the following fall. In a recent letter Dr. Niles says: "Following these tests all purchased stock was tested before being added to the herd, and in subsequent tests no reactions were obtained with the exception of a Holstein bull which was purchased on a local veterinarian's certificate and which reacted to my test and was killed, confirming my diagnosis on post-mortem examination. I had made no tests for a few years before leaving the station."

Dr. Niles severed his connection with the college in 1902 and for two or three years the herd was not tested. In 1905 Dr. John Spencer began testing the herd. Some of the reacting animals were slaughtered, others were placed by themselves in a row of stanchions in the stable but not otherwise separated from the herd. After the test of January 21-23, 1908, when 30½ per cent. of the herd reacted, it was decided to ask the assistance of the Bureau of Animal Industry of the United States Department of Agriculture and make a thorough and systematic effort to free the herd from tuberculosis. The herd was treated as if there had been no previous tests and 22 per cent. reacted to the test in June, 1909. All reacting animals were at once removed from the non-reacting, placed in other quarters half a mile away, and kept entirely separate. At the next test, made in April, 1909, nearly 35 per cent. of the healthy herd reacted. It should be stated that the barns and yards had not been disinfected since the previous test. After this test the stables and yards were thoroughly cleaned and disinfected, as they have been since whenever a reacting animal was found. A summary of these tests will be found in the following table:

CHART A.

| NAME OF PERSON<br>MAKING TEST.       | DATE OF TEST.        | Number<br>of<br>Animals<br>Tested. | Number<br>of<br>Reacting<br>Animals. | Number<br>of<br>Suspicious<br>Animals. | Per cent.<br>of<br>Reacting<br>Animals. | Number<br>of New<br>Cases<br>Reacting. | Number<br>of<br>Previously<br>Reacting<br>Cases<br>Retested. | Number<br>of<br>Previously<br>Reacting<br>Cases<br>at this<br>Test. | Number<br>of<br>Previously<br>Reacting<br>Cases<br>That<br>Failed to<br>React at<br>This Test. | Number<br>of<br>Reacting<br>Animals<br>Disposed<br>of Since<br>Last Test. |
|--------------------------------------|----------------------|------------------------------------|--------------------------------------|--|---|--|--|---|--|---|
| Dr. Spencer.....                     | March 21-23, 1905.   | 115                                | 21                                   | ..                                     | 18.3                                    | 21                                     | ..   | ..  | ..   | ..  |
| Dr. Spencer.....                     | April 26-27, 1905... | 22                                 | 9                                    | ..                                     | 40.9                                    | 1                                      | 19   | 9   | 11   | 2   |
| Dr. Spencer.....                     | April 3-6, 1906..... | 111                                | 26                                   | 1d                                     | 24.3                                    | 14                                     | 14   | 12  | 2  | 5a  |
| Dr. Spencer.....                     | June, 1906.....      | 27                                 | 7                                    | 2                                      | 25.9                                    | ..                                     | 23   | 7   | 16   | 4b  |
| Dr. Spencer.....                     | May, 1907.....       | 94                                 | 22                                   | 1                                      | 23.4                                    | 15                                     | 15   | 7   | 8  | 10  |
| Dr. Spencer.....                     | Nov. 11-12, 1907..   | 27                                 | 0                                    | ..                                     | .....                                   | ..                                     | 3  | ..  | ..   | ..  |
| Dr. Spencer.....                     | Jan. 21-23, 1908...  | 129                                | 39                                   | ..                                     | 30.2                                    | 29                                     | 12   | 10  | 2  | 14c   |
| U. S. Bureau of<br>Animal Industry.. | June 9-11, 1908...   | 113                                | 25                                   | ..                                     | 22.1                                    | 3                                      | 36   | 22  | 14   | 9   |
| U. S. Bureau of<br>Animal Industry.. | April 7-8, 1909....  | 89                                 | 31                                   | ..                                     | 34.8                                    | 27                                     | 11   | 4   | 7  | 28  |
| U. S. Bureau of<br>Animal Industry.. | Oct. 10-11, 1909.... | 58                                 | 0                                    | ..                                     | 0                                       | 0                                      | 6  | 0   | 6  | 32  |
| U. S. Bureau of<br>Animal Industry.. | April 27-28, 1910..  | 57                                 | 4                                    | 2e                                     | 7.0                                     | 3                                      | 6  | 1   | 5  | 0   |
| U. S. Bureau of<br>Animal Industry.. | Oct. 11-12, 1910.... | 52                                 | 0                                    | 0                                      | 0                                       | 0                                      | 4  | 0   | 4  | 5   |
| U. S. Bureau of<br>Animal Industry.. | April 26-27, 1911..  | 63                                 | 5                                    | 0                                      | 7.1                                     | 5                                      | 4  | 0   | 4  | 0   |
| U. S. Bureau of<br>Animal Industry.. | Oct. 25-26, 1911.... | 57                                 | 0                                    | 0                                      | 0                                       | 0                                      | 2  | 0   | 2  | 2   |

The beef and dairy herds are kept separate and there have been no reactors in the beef herd since April, 1909, although there were two old reacting cows among them until May, 1910, and once since. In the dairy herd there seems to be a "Typhoid Mary" that we cannot locate by tuberculin testing or physical examination.

In testing cattle with tuberculin the test may fail in two ways: first, cattle may react to the test and fail to show evidence of tuberculosis on post-mortem examination. The man opposed to tuberculin testing makes much of such failures. Such errors are few and to me are of practically no importance. In the Virginia Polytechnic Institute herd there were 279 animals that can be identified that were tested with tuberculin once or more since 1905. Of these 116 have reacted, or 41.58 per cent. Of the 116 reactors three have failed to show evidence of tuberculosis on post-mortem examination, or 2.6 per cent. Government statistics, covering a much greater number of animals, gives this error at 2 per cent. Tuberculin tests may also fail in that the animal may not react to the test and still have tuberculosis. Such errors are much more serious than the other class because a tuberculous animal that may be a source of infection is left in the healthy or non-reacting herd. This failure in testing is difficult to locate, and estimate for it is rare that non-reacting animals are available for post-mortem examination. In my opinion this error is more frequent than reactions that fail to show disease.

If we take the first government test of our herd—113 animals were tested—there were probably 11 tuberculous animals that failed to react, or over 9 per cent. I think this per cent. of error is much too high, as four of these reacted to the next test.

It is often claimed that a thorough physical examination of a herd at the time of testing will reveal these non-reactors. While such an examination is very important, there are comparatively few cases that can be thus detected.

We test our herd twice a year, in the fall just before going into the stable for the winter, and in the spring just before turning on grass. During the past three years we have had no re-

actors at the fall test but have had them at the spring test, indicating that they probably contracted the disease in the stables or yards during the winter. I consider frequent and thorough disinfection of stables and yards very important in freeing a herd from tuberculosis, just as important as eliminating an infectious animal. This, I believe, is where we greatly err—in being lax about disinfection of premises.

There are many points in tuberculin testing that we need light upon. We need a definite standard of tuberculin. We need to know more about what constitutes a reaction. We ordinarily say a rise of two degrees. Why not  $1\frac{1}{2}$  degrees or even 1 degree? Are there not some conditions that we do not understand that are favorable or unfavorable to getting reactions in a herd? Could we not have a large number of cattle tests with tuberculin just before they are slaughtered in order to determine how many may be tuberculous and not react? Tuberculin testing is not the simple process that many think it to be. It is only by the careful collecting of facts for and against the test that it can ever be put upon a scientific foundation and thus eliminate many of the puzzling problems that confront us at present.

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ANNUAL CONFERENCE FOR VETERINARIANS AT ITHACA—The fourth annual conference for veterinarians will be held at the New York State Veterinary College on January 10 and 11, 1912. All licensed practitioners of the state are most cordially invited to be present at this conference. Dr. Adams, of the University of Pennsylvania, Dr. Richard P. Lyman, of East Lansing, Mich., and Dr. Cassius Way, of Chicago, will be among the speakers. The program will be of a highly practical nature.

MISSOURI VALLEY MEETING—The Missouri Valley Veterinary Association will convene at the Coates House, Kansas City, on January 30, for a three days session. A valuable program of scientific and practical interest is being prepared. The clinical part of the program will include demonstrations and discussions of hog cholera and other diseases, and the intradermal and ophthalmic tuberculin tests. Anyone who can possibly do so, should take advantage of these highly educational features by attending this midwinter meeting.

## HOG CHOLERA.

BY F. R. COMBER, B.A., M.D.C., CHIEF ASSISTANT STATE VETERINARIAN,  
MADISON, WIS.

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*Synonyms.*—Swine fever, pneumo-enteritis, pig typhoid, blue disease, purples, red soldier.

The distinguishing features of this disease are a continuous fever, ulceration of the intestines and more or less discoloration of the skin, especially of the ventral surface.

*Etiology.*—The specific disease known as hog cholera is as some believe caused by *Bacillus cholera suis*, while other authorities hold the germ has not been isolated yet.

*Symptoms.*—The symptoms of hog cholera are by no means constant. The best informed writers on the subject agree that hog cholera cannot, with certain exceptions, be positively diagnosed from the symptoms. Animals suffering from various intestinal troubles frequently exhibit symptoms which very closely resemble this disease. There are two recognized forms, *i. e.*, acute and the chronic or mild form.

In the acute disease, the animals die very suddenly after a few hours or, at most, a few days' sickness. In the other form the disease runs a longer course. There is usually a rise in temperature of from 1 to 3° F.

The sick animals act dumpish and spiritless, lie quietly in a corner and huddle up together, usually concealing the head in the litter. They refuse to move when disturbed and are more or less oblivious to their offspring. The appetite varies. In acute cases the animals may eat quite heartily up to within a few hours before death. In more chronic forms they eat fairly well until the end. They may or may not have diarrhœa. Frequently the bowels are costive. It is quite common in these cases to have an

active diarrhoea during the last few days. The color of the discharge depends largely on the food. Vomiting rarely occurs. The changes in the respiration and the pulse are hard to determine. There is rarely any cough. Usually there is considerable reddening of the skin on the nose, ears, abdomen and on the side of the thighs and pubic region. The redness is diffuse and becomes more intense as death approaches. In some cases there is a discharge from the eyes. In the chronic form the animal becomes emaciated. These symptoms vary to such an extent that it is sometimes necessary to make post-mortem examination and even the diagnosis must often be delayed until the results of a bacteriological examination has been obtained.

It not infrequently happens that swine suffering from hog cholera are attacked with swine plague, the two diseases co-existing in the same animal.

*Differential Diagnosis.*—Hog cholera is to be differentiated from a great variety of dietary disorders and poisoning from alkalies and other chemicals which may get into the food. Powdered soap has been found to produce, when given in sufficient quantities, a series of symptoms quite similar to those of hog cholera. In addition to the many as yet etiologically undetermined disorders often producing a high mortality and popularly called hog cholera, infectious pneumonia or swine plague and tuberculosis are to be distinguished.

It sometimes happens that swine when kept under good hygienic conditions suffer from disorders which in their symptoms resemble hog cholera, but anatomically the lesions are varied and irregular. In one instance *Bacillus coli communis* seemed to stand in a casual relation to the trouble.

Recently the writer has studied two similar enzootics in which several animals died and where the lesions were very few and exceedingly varied.

The dietary disorders are determined by their history, the irregularity of the lesions and the failure to find the specific organism of hog cholera in the tissues of the dead animals. An important feature is the fact that the trouble does not extend be-

yond the herd or herds first attacked or animals fed and kept under like condition.

The amount of loss from these troubles is very large. They are often confused with and mistaken for hog cholera.

*Prevention.*—The bacteria causing hog cholera can be carried in the dirt, on animals, or, as is most usually the case, the pigs may have been but recently infected and, being transferred during the period of incubation, they develop the disease later. It not infrequently happens that the purchased animals are actually suffering from a chronic form of the disease to which they eventually succumb, but meantime infect others.

The bacilli of hog cholera live for a considerable time in water. On this account bacteria from outbreaks which start at or near the source of a creek or small river may be carried in the current and infect animals which wallow in the stream many miles below. By keeping swine in a small inclosure away from infected streams and fields the disease is often prevented.

The bacilli of hog cholera can be carried in the dirt which adheres to one's shoes or to farming utensils. It not infrequently happens that the virus is carried by buzzards, crows and other birds. There is no positive proof that the virus may not be disseminated in many other ways. The hypothesis emphasizes the necessity for promptly disposing of the dead animals instead of leaving them for the prey of scavengers.

If they cannot be burned it is best to cover the bodies with a liberal amount of lime and bury them.

When healthy hogs are separated from those suffering with the disease it is a safe precaution to dip them in a disinfectant to kill any hog cholera bacteria that may be upon the exterior of the body.

*Specific Treatment.*—A large number of investigations have been made to find a protective vaccine for the disease and also to find a specific serum treatment. Thus far satisfactory experimental results have not been fully obtained. In a number of instances, where the practical application of the serum treatment has been made most satisfactory results in nearly every instance

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followed, but the reports fail to give evidence of an accurate diagnosis of the disease treated. In these cases the better management of the animals in addition to the serum would suffice to check the disease if the trouble was of a dietary nature. There is need of additional investigation along these lines and money spent to throw more light on the treatment of this much dreaded disease would be well spent indeed, and it is a cause which merits the cooperation of us all.

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DR. P. K. NICHOLS, veterinarian to the New York City Department of Health, in charge of the Borough of Richmond (who is also diagnostician to the New York State Department of Agriculture in that borough), was the official representative to the United States Live Stock Sanitary Association at Chicago, from the New York City Board of Health.

THE MINNESOTA MEETING—The Minnesota State Veterinary Medical Association will hold its January meeting at the Merchants' Hotel, St. Paul, January 10, 11 and 12, and we are assured by its enthusiastic and energetic secretary, Dr. G. Ed. Leech, that it is to be a splendid meeting. In fact, there can be no doubt on that point after glancing over the following list of subjects and the names of the gentlemen that are to present them: "The Private Practitioner in Relation to the Contagious and Infectious Diseases in the State," by S. H. Ward, St. Paul; "Stallion Registration," from the viewpoint of the Registration Board, by Jos. Montgomery, secretary of the board; from the veterinarian's viewpoint, by Prof. Joseph Hughes, of the Chicago Veterinary College; "Animal Nutrition," by C. C. Lipp, University Farm, St. Anthony Park; "Status of Bovine Tuberculosis," by L. E. Willey, University of Minnesota., discussion by M. H. Reynolds; "Bacteriological and Seriological Abortion," by W. P. Larson, University of Michigan (Pathological and Bacteriological Department); "Shoeing and Balancing," by M. R. Higbee, Albert Lea; "Gastritis," by W. P. Anderson, New Ulm; "Poliomyelitis," by H. E. Robertson (M.D.), University of Minnesota (Bacteriological Department); "Impressions of the Mind of the Mother on the Offspring," by R. C. Nickerson, Zumbrota; "Value of Tuberculin Test on Dairy Products," by Joel Winkler, State Dairy and Food Commissioner; "Report of Examining Board."

## ROUP—SWELLED HEAD—OR DIPHTHERIA IN FOWLS.

BY E. T. BOOTH, V.M.D., PHILADELPHIA, PA.

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Roup in fowls is an infectious disease, the lesions of which first appear on the mucous membrane of the nasal passages, eyes, mouth, pharynx, larynx, and may extend to the trachea and bronchi and air sacs.

The disease is determined by a grayish-yellow exudate which forms upon the mucous surface of one or more of the parts mentioned.

The exudate may be so abundant as to obstruct the air passages.

In many cases or outbreaks, the loss is very great, and may destroy most or all of the birds in the flock.

There are cases on record which indicate that the diphtheria of fowls may be communicated to children and cause a serious and even fatal sore throat.

The disease is usually introduced into a flock by the exposure of the birds to sick ones at shows, or by bringing affected fowls on the premises.

There is a general belief that the disease may be developed by exposure of birds to draughts of air, or by keeping them in damp, filthy and badly ventilated houses.

My experience has been, in showing birds, that very frequently my birds have been returning from shows suffering with the disease and contribute a great deal of the cause to exposure, as express agents during show periods, which are most always in winter, carry the birds around perhaps for hours before they are delivered.

I have also witnessed where birds were shipped to shows in perfect condition and, due to the exposure, on reaching the show

they would show a watery discharge from the nostrils and the eyes, which would be the first symptoms of the disease, and lead on to further stages when the birds would show weakness and arch the back; the feathers would show roughness, and the respiration is more or less obstructed, and swallowing is difficult. There is a frequent shaking of the head and sneezing and expectoration of mucous secretions. The tongue is pale and shows grayish spots. The appetite disappears, and there follows a diarrhoea of a greenish or yellowish color. The eyes are unnaturally dilated, projecting, and possibly partly covered with a thick secretion which accumulates between the lids; the nostrils are similar.

There are various other lesions too numerous to mention, as it is not my intention to detail the pathology and post-mortem changes.

The main object in writing this article is, the loss is so great and the treatment very simple.

Many think to destroy the affected birds would be the quickest remedy; well, this might be very expensive, especially where a man has a flock of birds which he uses for show purposes and they average him anywhere from \$15 and up to a few hundred dollars a head.

Under such conditions would you advise to destroy?

These have been some of my experiences, which were many, especially during the show season.

My method is to isolate all birds showing symptoms of the disease, and disinfect the premises. If the number affected is not too many, cleanse the eyes and nostrils with mild antiseptics.

Due to the great inflammatory condition of the larynx and pharynx the birds will show great thirst. I use about a 3 per cent. to 5 per cent. solution of potassium permanganate ( $\text{KMnO}_4$ ) and allow no other water to drink and keep the birds in a dry and warm place. I find this treatment, which is simple, to give the best results I have ever seen or heard of.

I recall birds which cost me quite considerable, where they were unable to hold their heads up, and I was compelled to

administer the solution with a small syringe every few hours; and by keeping the parts cleansed and keeping them in a warm place I have had wonderful results, with quick recoveries.

The shows have already started and the cold weather is at our doors, which means the trouble will soon be on our hands. If you have any occasion to try it, I am sure you will think as I do—we could not do without it at any price.

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THE STATE BOARD OF VETERINARY EXAMINERS OF INDIANA, will meet January 9-10, 1912. Everyone desiring to practice veterinary medicine and surgery in Indiana, must, under the laws of that state as now amended, pass the examination. Prior to the amendment, graduates from reputable colleges were given licenses on presentation to the licensing board, of their diplomas, and they could demand same, even if they could not pass the state board. Particulars in reference to place where examination is to be held can be obtained from the secretary of the board, Dr. O. L. Boor, Muncie.

THE fifth annual meeting of the Georgia State Veterinary Association was held at Atlanta, December 21 and 22 last, and the question is how did they do it? How did they get into two days the amount of literary work set forth in their program? To be sure their secretary is a "live wire," and that counts for a whole lot in any organization. He says to the members, "Your interest is at stake. Parasites alone expect to reap where they don't sow." That expression surely has a wide application and should make us all "look ourselves over," and if Dr. Bahnsen is the originator of it he deserves credit.

ON page 543 of this issue will be found a report of the arrangements as perfected by the local arrangements committee of the A. V. M. A., which we are able to give to our readers through the courtesy of Secretary Marshall, who is also desirous that every member of the association should begin at once to make plans and arrange to attend this meeting. Local associations should appoint delegates and send their names to the secretary early, so that they can be printed in the program. Members of each state or province should assist their resident secretaries in procuring new members. No effort should be spared in getting every eligible veterinarian enrolled in the membership list. Applications must be in the hands of the secretary not later than July 29, 1912.

## REPORTS OF CASES.

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### TWO CASES OF VOMITING; ONE IN A MULE. THE OTHER IN A HORSE.

By A. T. FERGUSON, D.V.S., Evansville, Indiana.

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*"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."*

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I was called to see a mule belonging to a German. On arriving at the house, the owner stated the mule was off his feed; and on examining the animal, I found a subnormal temperature, the animal refusing all food and water. A purgative was administered with a remarkably good effect, but the animal still refused food or water. The day following he appeared to be in intense pain, as though suffering from some form of colic.

The animal would continually regurgitate food and a watery substance (a pure case of vomiting). The animal would continually lay down and stretch its front legs out their full length; this continued for some time, until he became dangerous and extremely violent.

The case looked hopeless and the prognosis doubtful; but while the animal had a spell of quiet, a capsule containing Bismo nitrox was administered; this seemed to have a remarkable quieting effect upon him, and also relieved the greater part of the vomiting. Another capsule was given one-half hour after the first, which stopped the vomiting entirely.

The after-treatment was tonics and stimulants. In two days the animal had made a complete recovery.

The second case, however, was not so easily relieved. I was called at 12 p. m. to see a gray gelding seven years old. On arriving at the barn the owner stated the animal had colic. On examination I found the symptoms of colic and 1 gr. of arecoline was given; this relieved the colicky pains, but the animal was continually belching with great force and would regurgitate

food, and an immense amount of water, both from the mouth and nostrils. The animal became dull and stupid; refused all food; appeared to have the throat paralyzed. Anodynes and stimulants were administered to relieve pain and stimulate the functions of the stomach. Bismo nitrox was given but was of no material value in this case. The animal continued in that condition without any improvement and the vomiting became so violent and so frequent that the material thrown up would in many cases return and find its way down the bronchi and into the lungs, which created broncho-pneumonia.

Treatment seemed of no avail and in twenty-four hours the animal died. I then made a post mortem and found the following conditions. The lungs were completely congested and filled with ulcers varying from the size of a hen's egg to a pea; trachea very much inflamed and bronchial tubes engorged with ulcers. The stomach was in a state of paralysis; the pyloric was pale and flabby, gastric gland destroyed, and contained numerous ulcers in a somewhat compact arrangement and close to the cardiac entrance of the stomach. The stomach contained, besides, a large quantity of food and a great number of botts.

All other organs seemed normal. The large colon contained some undigested material. All the other intestinal tract was filled with fluid.

Now, the question comes, what caused these conditions?

The answer seems to me simple. The animal had been fed for some considerable time on tobacco to remove worms that did not exist excepting in the mind of the caretaker of the stable.

To my mind here was a clean-cut case of nicotine poisoning.

In toxic quantities, nicotine is a powerful gastro-intestinal irritant, and produces the usual symptoms of colic; pains, vomiting, purging, and collapse. All of these were present in this animal, with stupor and refusal to move, remaining in an attitude of quietude until collapse.

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## A TWELVE-INCH HATPIN IN A SIXTEEN-INCH DOG.

By JAMES McDONOUGH, D.V.S., Montclair, N. J.

This pup was brought to my hospital on the evening of November 21 with the history that he had been coughing since noon. While in my office he had a severe spell of coughing, but seemed bright, and showed no symptoms of pain.

The character of the cough caused me to suspect the presence of a foreign body in his throat, while a careful examination failed to disclose any trouble there.

At the base of the neck, to the right of the median line of the trachea, a pointed foreign body could be detected under the skin. I made an incision at the point through the skin and muscular tissue, but was unable to remove it. I then made an incision through the trachea and grasped with my forceps what looked like a piece of wire. When pulling it out, its direction seemed to be from below to above, and from left to right. When nearly a foot had been removed, its progress was suddenly checked; upon examination it proved to be a hatpin, with the head on the opposite side of the trachea, and in the œsophagus. I then made an incision through the opposite side of the trachea, where the pin had entered it, through which I gently pulled the head of the pin and a portion of the œsophagus, into which I made a small incision and removed the pin.



A—Opening in neck where pin was removed.      B—Point of pin.      C—Head of pin.

This hatpin was exactly twelve inches long, while the dog's body was sixteen inches long from the point of the shoulder, and he weighed sixteen pounds.

Absolutely no treatment was applied and he made a rapid and uneventful recovery. No anæsthetic was used, as I thought

a small incision through the soft tissue was all that would be necessary to remove the small body felt under the skin.

The dog had swallowed the pin, but how the head could reach a position that would permit of the point piercing the œsophagus and trachea on a line with his body is hard for me to understand.

The pin is made of tempered steel and very flexible, which accounts for its being perfectly straight when removed.

### A CASE OF TETANUS IN A SUCKING COLT.

By CHAS. H. HART, M.D.C., Granville, Ia.

Thinking the following record of a case of tetanus in a sucking colt may be of interest, I submit same.

HISTORY.—Filly colt, three months old, lame in right hind foot. Made examination and could not discover any lesions; about thirty days after developed symptoms of tetanus.

TREATMENT.—Hypodermatic injection of alcohol ʒ ounce, and the following:

|   |                          |                           |
|---|--------------------------|---------------------------|
| ℞ | Ac. Hydrocyanicum, dil.  | } aa. . . . . half ounce. |
|   | Fld. ext. Gelsemium      |                           |
|   | Fld. ext. Physostigmatis |                           |

M. Sig. Two drachms in two ounces of water t. i. d.

This prescription was given for three weeks; result, recovery.

“It is clear that the veterinary profession is now called upon to take a wide grasp of questions affecting the public health—the health of man as well as of animals. You cannot, indeed, dissociate the public health of man from the public health of the animal, because there are so many infectious diseases that the animal can and does transmit to man, so that human medicine and veterinary medicine have a very close alliance and association with each other. Therefore we must now look at the veterinary profession as a profession which is not only concerned in, if I may say so, the doctoring of animals, but which has to do with disease of various kinds in its wider aspect, embracing man and animals.”—(*An extract from a recent address by Sir William Turner, K.C.B., Principal, University of Edinburgh.*)

## ABSTRACTS FROM EXCHANGES.

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### ENGLISH REVIEW.

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

PARALYSIS OF THE RECTUM AND BLADDER IN A HORSE [Capt. E. P. Argyle, A.V.C.].—This officer's bay hunter gelding, seven years old, has always been well, and after three days' observation it is noticed that he has passed no dung and that the urine only dribbles away from the sheath. The tail being raised, it is observed that the rectum is full, the sphincter is partly relaxed and the orifice full with dung. A bucketful of it is removed by hand. On rectal examination the bladder is found full and painful on pressure. Slight relief is obtained by hot fomentations on the loins and perineum, with also enemas. Exercise, change of diet are followed by same condition and occasionally a normal motion of the bowels. There had been at some time fracture of the ischium. Soon the inside of the sheath becomes sore and excoriated. Electricity gave no benefit, aloe only temporary relief, tonics and nervous stimulants are negative. The gluteal muscles become atrophied, the case gradually grows worse and the animal is destroyed. At the post mortem were found: bladder with indurated and thickened walls. It is half full of urine, thick and containing a good deal of sabulous matter. It is ulcerated here and there. Rectum is abnormally distended, its mucous membrane pale and thickened. Spinal cord being exposed, the dura mater is inflamed. In the lumbar region there are two abscesses about the size of a bean and containing black pus. One is situated between the first and second lumbar vertebrae, the other between the last vertebrae and the sacrum. The paralysis was due to these lesions.—(*Vet. News.*)

SULPHATE OF MAGNESIUM AND TETANUS [W. A. Dykins, M.R.C.V.S.].—This is the record of a successful use of this salt in the treatment of tetanus in a heifer. The animal had already been sick for some days. She had calved, was delivered and cleaned without antiseptic precautions, and had been noticed

ailing some seven days before. The beast was standing in a Kraul, in great distress, with a rigid posture, head extended, tail straightened and elevated. She would lay down but had to be assisted to get up. Trismus had been severe but improving. Muscles of the neck, chest, loins and limbs showed some severe spasms. Nostrils were dilated and membrane nictitans protruding over the eyeball. Animal showed accentuated reflexes. Breathing and pulse accelerated. Temperature normal. Obstinate constipation. The treatment was the administration of sulphate of magnesia. She had already taken two pounds of salts from the owner and received two subcutaneous injections of saturated solution of the salt, 40 c.c. a day, 20 on each side of the neck. Those were kept up for a few days. Recovery followed.—(*Vet. Record.*)

CARCINOMA OF THE VULVA IN A MARE [*L. W. Wynn Lloyd, M.R.C.V.S.*].—Fourteen years old, this mare had a growth the size of a man's fist, ill defined, fixed on the lower third of the lips of the vulva and along the floor of the vagina for about two inches. It seemed not to interfere with the animal beyond matting the hair on the tail and covering the buttocks with blood and discharge. The parts were thoroughly washed and cleaned with antiseptics and codrenin injected in several points of the tumor. The lips of the vulva being kept apart by an assistant, the growth was dissected and the parts treated antiseptically. The histological examination made the tumor one of carcinomatous nature.—(*Vet. Journal.*)

CAESARIAN SECTION IN A BITCH [*G. Mayall, M.R.C.V.S.*].—"Midge" was twenty-two months old and pregnant with her second litter. She was delivered of one dead pup and the nose of a second could only be touched by examination. Extract of ergot does help her only a little and delivery seems impossible except by smashing the cranial bones. This was done, but even then the extraction of this fœtus cannot be made. Caesarian operation is suggested. The owner consents and the abdomen being open, the uterus being explored, one pup is found and extracted. The uterus was well scrubbed with chinosol solution and the wound closed with two rows of sutures on the uterus, the abdominal muscles with catgut, and the skin with hempen cord. Dressing was put over. The animal tore it after a few days, also some stitches. This complication was, however, prop-

erly managed and ultimate recovery followed. Most careful diet of milk and barley water was carried out for a few days.—(*Vet. Journal.*)

AN UNUSUAL CASE OF POLL EVIL [*H. D. Jones, M.R.C. V.S.*].—Case, illustrated by photos, of a cart mare which had been treated several times for swelling over the poll. Difficult animal to handle, no surgical treatment had been attempted before. The swelling would break, discharge, close and return after variable space of time. Recently the swelling appeared very large, broke, and the animal was cast for proper examination. In so doing the instrument became in contact with bone. The ligamentum nuchæ was curetted, drainage secured and the animal allowed to rise. Twenty-four hours after she was found in her box, unable to get up. Spinal complications were suspected and the mare destroyed. On examination of the parts it was found that the ligamentum nuchæ was somewhat diseased, that there was bony deposit on the occipital and also on the floor of the vertebral canal. The atlas was ankylosed with the occipital. No condyles could be seen and the styloid process of the right side was ankylosed to the wing of the atlas. There were no movements of any sort between the skull and the atlas.—(*Vet. Record.*)

CONGENITAL DIAPHRAGMATIC HERNIA [*W. R. Davis, M.R. C.V.S.*].—Since born, three weeks previous a valuable thoroughbred foal has been healthy, when one morning she is noticed in the paddock standing by herself and breathing quickly and with difficulty. Her temperature was 103° F. and pulse not greatly disturbed. The nostrils are dilated and the breathing disordered and like in a broken-winded animal. By auscultation, no respiratory murmur is detected on the left side but sounds distinctly intestinal. On the right side the respiratory murmur is heard and also intestinal rumbling as on the left, but more obscure. The mother and foal were kept for three weeks, the little patient sucking well and being quite lively. One day when feeding the mother, the foal took some of the food, which brought on a severe attack of indigestion. Although the temperature had become normal and the pulse about so, the auscultation gave always the same symptoms. Once the foal and mother were turned out to grass. The foal started galloping but quickly came to a standstill, legs apart, nostrils dilated and flanks heav-

ing. The condition was such that the owner was advised that the little animal could never make a race horse and had better be destroyed. A few days after she took colic and died. At the post mortem there was found a "large orifice in the diaphragm, low down and towards the left side, the hiatus being due to a want of continuity between the phrenic and the muscular portions of the diaphragm. The small intestines and a portion of the colon, with most of the cæcum, together with the left lobe of the liver, were lying in the thoracic cavity."—(*Vet. Record.*)

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### FRENCH REVIEW.

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

PAPILLOMATOUS LARYNGO-TRACHEITIS [*Prof. G. Petit and R. Germain*].—Observations of sudden death by asphyxia due to inflammatory or neoplastic lesion of the larynx or trachea are not common conditions in animals no more than in man. This and the following from the same authors are interesting.

Bulldog, two and a half years old, was eighteen months ago taken with distemper complicated with broncho-pneumonia which has left a nasal discharge rebellious to all treatment. This is muco-purulent, abundant, unilateral, or again bilateral. It increases by exercise. There is dyspnœa during meals. Examination localized his trouble as being in the laryngo-tracheal region. Examination of the mouth brings out an escape of muco-pus coming from back the soft palate. As the dog is threatened with suffocation, the examination is postponed to the next day when tracheotomy will be performed. At 11 o'clock the next day the dog seems in good condition; at 12.30 he is found dead, having been asphyxiated while taking his meal.

Post mortem showed the laryngeal and tracheal mucous membranes covered with thick, sticky muco-pus, and two tumors which close almost completely the larynx. One is small and spherical on the right ventricle of the glottis, the other papillomatous and exists on the right vocal cord. On the left cord were also smaller warty elevations.—(*Bullet. de la Soc. Cent.*)

FATAL PHLEGMONOUS LARYNGO-TRACHEITIS [*By the same*].—Twelve-year-old dog is on treatment for a severe dyspnœa.

Great anxiety, eyes protruding, respiration slow. The thorax dilates beyond measure, ribs are rising under the skin, flank and abdomen are retracted. The throat is very painful, the slightest pressure promotes hard whistling cough, with escape of greenish muco-purulent discharge. Deglutition is very difficult. The dog is found dead one morning in his kennel. *Autopsy*: Greenish muco-pus in great quantity in the larynx and upper half of the trachea. Mucous membranes are inflamed and have an hæmorrhagic aspect. They are thick. There is an abscess on the right vocal cord whose contents have affected the cricoid cartilage, which is necrosed. On the left side, on the level with the three first tracheal rings, the mucus is so thick that partial occlusion of the canal takes place.—(*Ibid.*)

OPEN FRACTURE—SUTURE OF THE BONE [*MM. Dumazel and Lapperousaz*].—Four-year-old Gordon setter had an open fracture of one hind leg. The tibia and fibula are fractured obliquely, and the extremities protruding without periosteum, and containing a grayish and purulent marrow. The tissues surrounding are more or less involved and the seat of a large swelling which extends on the whole leg. Treatment is carried out by first thorough disinfection, then application of silicate of potash, splint leaving free access to the open wound. By careful attention, continued disinfection and proper diet the condition of the animal was improved and all was doing well except the immobilization and union of the two ends of the fractured bones. However, towards the twentieth day, as all dangers of septicæmia had subsided, the animal was put to sleep and, the bones being well put in place, fine gimlet holes were made through which strong metallic wire was passed and the bones properly secured. A second circular ligature was also applied. The same treatment was then resumed. The antiseptics did their work well. Little necrosed pieces of periosteum and splinters of bone exfoliated by degrees, and although the dog tore his dressing once, no harm followed as union was then well established. Recovery was perfect (*Journ. de Zootech.*)

EMBRYO OF FILARIA AND SYMPTOMS OF DOURINE [*Capt. Darmagnac*].—Stallion, "Maïettobe V.," has a cold, painless swelling of the sheath which keeps on getting bigger and spreads under the belly. He also has œdematous pimples on the neck and croup. A few days later there appears on the ribs of the

right side a circular patch resembling those observed on the skin in dourine. After remaining present for about two weeks, these symptoms gradually subsided and left no mark except that on the sheath there remain spots of lost pigmentation, which give it a peculiar aspect.

The examination of the blood, taken round the swelling of the sheath and the cutaneous lesions revealed the presence of a very mobile parasite, differing entirely from the trypanosome of the dourine and was an embryo of filaria. It was vermiform, rounded at one extremity and thinned out at the other. It was clear white with darker points on the body. He moved rapidly. It colors easily with blue of methylene or thionine. Its disparition coincided with that of the lesions. Inoculations to rabbit and dog were negative. The horse received two subcutaneous injections of 5 grammes of Atoxyl.—(*Rev. Gen. de Med. Vet.*)

MELANOSIS TREATED SURGICALLY [*Capt. G. Remond, Army Vet.*].—Light gray gelding, with no previous pathological history, is carrying numerous melanotic tumors through the thickness of the dermis, which vary in size between that of a hazel nut and that of a big French nut. Located principally on the region of the back where the saddle is put, on the croup, and on the internal face of the legs; some are spread also on the lateral faces of the thorax, where surcingle is applied. On this account the animal could not be saddled; he was useless and proposed for reform. Before that, however, surgical treatment was suggested. All the tumors that were visible except those of the base of the tail and inside of the thighs were removed. After twenty days' treatment the horse was able to resume his work, the cicatrization having taken place rapidly and without complication. The horse could be saddled and harnessed. No relapse has occurred so far.—(*Rec. and Med. Vet.*)

ATROPHY OF THE CEREBELLUM IN A NEW-BORN CALF [*Mr. F. Robin*].—Since birth this calf has presented curious nervous symptoms. He generally lays in complete lateral decubitus, the head greatly extended on the neck, and remains in absolute immobility. If he is made to get up he cannot stand, is unable to keep his equilibrium, shakes on his legs and drops. The general sensibility of the trunk and limbs is entirely abolished; long pins thrust in its ischio-tibial muscles have no effect; but on the contrary the cutaneous sensibility about the head seems exaggerated. Pricks on the nose are painful. Hearing and

sight seem normal. If a finger is introduced in his mouth, the calf sucks on it; also if a teat is pushed in; but if this drops out the animal does not try to take it up with his tongue. If water is offered to him in a pail, he dips his head down to the bottom, fearless of asphyxy. At intervals, or under the influence of more or less severe excitement, he has tonic contractions of his muscles, the head is carried on opisthotonos, and the eyes rolled in the orbits. The calf is killed. *Autopsy*: Meninges greatly congested, also the cerebral substance. The cerebellum offers the principal lesion, being half its normal size. It weighs 7 grams. Its lateral lobes present in their centre a marked depression, at the bottom of which the gray substance is wanted. However, on a longitudinal and median section the ramifications of the arbor vitæ are normal except on the sides corresponding to the depression of the lateral masses. The author considers the case as a simple arrest of development and not as a regressive phenomena.—(*Rev. Veter.*)

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If you want to pass through any turnstile on this continent, just tell the man at the wicket that your name is G. Ed. Leech.

FOURTH ANNUAL SMOKER OF THE VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY—Those who were fortunate enough to attend the "smoker" given by the above association one year ago, will need no urging to get them there again this year; it would be more of a task to keep them away, especially when they learn that the same committee, with Dr. Charles E. Clayton as chairman, will again have charge of the affair. To those who were so unfortunate as *not* to have been there last year, we will say, *do not let it get past you this year!* It will be held as on previous occasions, at Reissenweber's, Fifty-eighth street and Eighth avenue, on January 17, 1912, at 8.30 p. m. The tickets will be \$2 and can be obtained from the chairman of the committee, Dr. Chas. E. Clayton, No. 207 West Fifty-fifth street (Manhattan); from Dr. E. Ackerman, of the committee, No. 167 Clymer street (Brooklyn); of Dr. Maffitt Smith, also of the committee, No. 43 West Ninetieth street (Manhattan), or from the secretary of the association, Dr. R. S. MacKellar, No. 351 West Eleventh street (Manhattan). No better form of relaxation from the strain and exactions of practice can be indulged in than attendance at this so-called smoker.

## BIBLIOGRAPHY.

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### MEAT HYGIENE.

A TEXT-BOOK OF MEAT HYGIENE. WITH SPECIAL CONSIDERATION OF ANTE-MORTEM AND POST-MORTEM INSPECTION OF FOOD-PRODUCING ANIMALS, by Richard Edelmann, Ph.D., Medical Counsellor; Royal State Veterinarian of Saxony; Professor at the Royal Veterinary High School in Dresden. Authorized Translation Revised for America, by John R. Mohler, A.M., V.M.D., Chief, Pathological Division, U. S. Bureau of Animal Industry, and Adolph Eichhorn, D.V.S., Senior Bacteriologist, Pathological Division, U. S. Bureau of Animal Industry. Octavo, 392 pages, with 152 illustrations and 5 colored plates. Cloth, \$4.50 net. Lea & Febiger, Publishers, Philadelphia and New York, 1911.

Meat hygiene is one of the most important subjects that confronts mankind to-day. A meat that is free from disease and in condition not to *cause* disease to mankind when used as an article of food; and no other product is more universally so used by the human race. Realizing this, and the necessity for careful inspection of meat, based upon a thorough knowledge of the diseases to which meat-producing animals are heir, the authors have spared no effort in producing a work that covers every phase of the subject; and the world owes a debt of gratitude to these scientists, who, in the midst of their labors, have given enough of their time for its production. The author of the original German edition is a doctor of philosophy, medical counsellor, royal state veterinarian of Saxony and professor of the Royal Veterinary High School at Dresden; and the two gentlemen who have translated the work into English and made such changes in it as were necessary for its perfect adaptation to American requirements are veterinarians and scientists of the highest order to be found in *any* country; holding the most important positions in relation to animal pathology in the government of the United States. It is to that type of men, who have given of their precious time and from their unusual experience, that the world is indebted for *Edelman, Mohler and Eichhorn's Meat Hygiene*. The thirteen chapters into which it is divided, treat thoroughly and in a most interesting manner, of the Origin and Source of Meat Food; Morphology and Chemistry of the Principal Tissues and Organs of Food Animals; the Production, Preparation and Conservation of Meat; Regulations Gov-

erning Meat Inspection of the United States Department of Agriculture; Organization and Methods of Procedure of the Inspection Force; Decisions of the Veterinary Inspectors and Disposal of the Condemned Meat; Abnormal Conditions and Diseases of Food-Producing Animals; Infectious Diseases in Food-Producing Animals; Postmortem Changes of Meat; Examination and Judgment of Prepared and Preserved Meats, Chickens, Game, Fish, Amphibia and Crustaceans; Meat Poisons; History of Meat Hygiene, and Abattoirs and Stock Yards. The 152 illustrations, embracing as they do, methods of casting a bull, a stock car for transportation of live animals, appliances for branding and tagging, methods of killing and appliances, sides of beef, veal, mutton, hog, etc., showing the commercial cuts, others displaying all the different glands, vertebræ, forearms, scapulas, etc., etc., of different animals used for food, interior of a refrigerating railroad car for transportation of meat, and everything in fact that has to do with the subject, together with the colored plates illustrating pathological conditions of the liver, lung, kidney, udder, etc., distributed throughout the work, materially assist in a clear understanding of the subjects under discussion. No detail of the work, in connection with the preparation and preservation of meat, seems to have been too small to merit attention at the hands of the authors, who, through their publishers, have presented to the public a work that is indispensable not only to those engaged in meat and food inspection, but to every veterinarian, all of whom are interested in the vital subject of healthful food products.

## DORLAND'S AMERICAN ILLUSTRATED MEDICAL DICTIONARY.

The New (6th) Edition Revised.

DORLAND'S AMERICAN ILLUSTRATED MEDICAL DICTIONARY. A new and complete dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Medicine, Nursing, Biology, and kindred branches; with new and elaborate tables. Sixth Revised Edition. Edited by W. A. Newman Dorland, M.D. Large octavo of 980 pages, with 323 illustrations, 119 in colors. Containing over 7,000 more terms than the previous edition. Philadelphia and London, W. B. Saunders Company, 1911. Flexible leather, \$4.50 net; thumb indexed, \$5 net.

This most excellent work is indispensable to students, practitioners or writers in any branch of medicine. Convenience of

consultation, as a result of careful arrangement of matter by the editor, making it possible to obtain the information sought in the shortest possible time and with the least possible difficulty. Special attention has been given to the wording of definitions, with the intention of making them clear, concise and yet sufficiently complete. Its value to the three classes in medicine, or veterinary medicine, mentioned above becomes apparent when we note that under each drug are given its composition, sources, properties, uses and dose; under the more important diseases, an account of their etiology, symptoms, etc.; under the principal organs, a description of their structure and function. Then there will be found in addition to the anatomic and clinical tables, specially prepared tables of tests, stains and staining methods, methods of treatment. Besides which, thirty-six pages have been especially devoted to posology and therapeutics, as a sort of an appendix at the back of the book. The illustrations in this work are especially commendable, 119 of the total of 323 being in colors, comprising beautiful anatomical, physiological and pathological plates. The important features of pronunciation and derivation have received the most careful attention. In short *Dorland's American Illustrated Medical Dictionary* is indispensable to physicians, veterinarians and dentists, as it has proved itself to be to the reviewer, on whose desk it has had a constant place since its fourth edition (1906). The publishers deserve great credit for the high class manner in which the work has been gotten out; bound in flexible leather, of rich red, with gold lettering, it is a volume that anyone may be proud to possess.

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## DORLAND'S AMERICAN POCKET MEDICAL DICTIONARY.

The New (7th) Edition.

DORLAND'S AMERICAN POCKET MEDICAL DICTIONARY. Edited by W. A. Newman Dorland, M.D., editor "Dorland's American Illustrated Medical Dictionary." Seventh Edition, 32 mo. of 610 pages. Philadelphia and London, W. B. Saunders Company, 1911. Flexible leather, gold edges, \$1 net; thumb indexed, \$1.25 net.

This beautiful little volume, a miniature of *Dorland's American Illustrated Medical Dictionary*, has been edited with the same care as the former, and is, therefore, just as accurate, and has the advantage of being sufficiently small to be carried in the

pocket, as a result of brevity, where the larger dictionary elaborates, and is without the illustrations. But it does just what its editor aimed to have it do, it fills the need for a pocket medical dictionary, not only for physicians, but for veterinarians, and fills that need perfectly. Carriage, automobile or train riding, is not conducive to the reading of extensive definitions or the studying of illustrations; we want quick and concise definitions; the *extensive* study is for the office and library. The editor has therefore provided for both conditions with two volumes in a manner that it would not be possible to provide for them in one volume. This little pocket dictionary has an index to all the tables, so that they can be located without any delay, has tables of weights and measures, both in the apothecary and metric systems, has a table of doses in both systems for the physician and another one especially arranged for the veterinarian in both systems of measurement. So that it will be seen that *Dorland's American Pocket Medical Dictionary* stands in the same position as the larger one, *it is indispensable*. All veterinarians should have them both. With this little work, the publishers have again displayed their exquisite taste and familiarity with high-class work. Like the larger work, it is bound in soft, flexible leather, with gold lettering and gold edges.

DR. A. N. LAWTON, Brodhead, Wis., is building a new \$1,000 hospital and a \$3,000 residence on a prominent corner of the main thoroughfare of that city. We congratulate the doctor on his enterprise.

THE State Board of Agriculture of the Colorado State Agricultural College, at its semi-annual meeting held in December, changes the degree in veterinary science from Doctor of Veterinary Science to that of Doctor of Veterinary Medicine, and the name of the Division of Veterinary Science to that of Division of Veterinary Medicine. What state board will be next?

AT the November meeting of the Veterinary Medical Association of New York City, a donation of twenty-five dollars (\$25) was voted to the monument fund of Prof. S. Arloing. While that is not a large sum of money, yet it shows a spirit of appreciation on the part of that little organization, of Prof. Arloing's contributions to the advancement of veterinary science; and the emulation of its act by every veterinary association would be commendable.

## ARMY VETERINARY DEPARTMENT.

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### THE NEW ARMY VETERINARY BILL.

The Maneuver Division, mobilized at San Antonio, Texas, during the Mexican revolution, brought together eight army veterinarians. Early in April letters were received from other army veterinarians, requesting us to use this representative gathering to draft a new army veterinary bill on improved lines, as the old bill (H. 1964) was looked upon by the authorities as disposed of by the enactment of the retirement clause for army veterinarians.

In response to this call, a preliminary meeting was arranged in the camp to consider the proposals made by the correspondents. This resulted in a draft of a bill principally along the lines suggested in 1908 by Major Cameron, 7th Cavalry, then Assistant Commandant of the Mounted Service School. The draft was submitted to the five veterinarians stationed at Fort Riley for correction and approval, and on its return was printed and circulated among all other army veterinarians in the United States, the Philippines and Honolulu for further criticism and approval.

The draft of the bill was unanimously approved by all present in the States, but objected to by those in the Philippines. This resulted in a long delay and in several protracted meetings. By incorporating the wishes of the majority, by asking advice of influential army officers, and by engaging legal counsel, a bill was finally perfected that overcame the principal objections raised and met the full approval of the great majority.

The labor entailed in the preparation of this bill was incessant and often trying, yet the patience and good will displayed by the veterinarians in camp was most commendatory. The strong *esprit de corps* that developed during the debate of the bill, by an animated correspondence, was interesting, as indicating an advance all along the line in ideas, in unity of purpose and action.

From the above account it should appear that the new bill is not a one man's measure. Still, some colleagues have assailed me as the sole author of everything bad in the bill, while others

have given the bill my name. In justice to the other seven veterinarians in camp, Drs. Le May, Glasson, Gage, Gould, Mitchell, and later McDonald and Lytle, I must protest this honor, as all of them have equally shouldered work and responsibility. This new bill is essentially a compromise, embodying the ideas and wishes of nearly every one heard from. No one man's bill would have found more than a very few supporters, so radically different are the opinions of many, and we aimed at a measure that should bring us all into line. It is true that not all wishes could be considered. Those of a purely personal consideration had to be thrown out, because we were in equity bound to consider equally well the probable wishes of the War Department and the standpoint likely to be taken by our national legislators. No measure enacted for the mere individual relief does ever bestow real good upon the schemer, while a generally progressive law reacts beneficially upon all and everyone. Above all, Congress is generally favorably inclined towards a proposal that appears broad and comprehensive, because it is something worth while to consider.

One of the objections raised was against the consolidation of the army veterinary service. Happily, it was sustained by the majority, and the wisdom of doing so is becoming already apparent. According to service papers, the Quartermaster General, United States Army, intends to again ask Congress to raise the pay of the civilian veterinarians employed in his department. The Commissary General is in a quandary where to place his veterinary inspectors in the newly proposed bill creating a general supply department. If we had confined our bill to merely seek an improved position for the veterinarians of cavalry and field artillery, we would have witnessed a piece-meal veterinary legislation that would do the Government no good and would remain a farce as viewed from our professional standpoint.

Thus the need of a homogeneous veterinary force in our army is coming to the front by a succession of events over which we had no direct control. The Maneuver Division, too, plainly demonstrated that the army wants an improved veterinary service by establishing a field veterinary hospital with a capacity for one hundred horses, and by introducing veterinary sanitary measures. The results obtained were favorably commented upon by the commanding general and all officers concerned, and steps were taken to institute in the future a systematic service for a division in the field to be under the supervision of a chief veterinarian.

When all such things happen, we must be alert to read the signs of the times and to seize the opportunity offered for a general advance along the line of veterinary progress. The ultra conservatives among us should consider that the new bill provides only for so much of an advance as we, in a body, can shoulder at the present time, with a view to make it a success. Later, veterinarians can then build up on the foundation.

The new bill and brief are now out of our hands, to be brought forward to the proper places by men chosen to do so by our national association. We bespeak success for them, because this new measure is pre-eminently one appealing to the sense of economy of our congressmen; to the sense of humanity of those who wish our horses properly treated, and generally to those in the army who want them to be preserved healthy and serviceable.

OLAF SCHWARZKOPF.

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#### A BILL

To consolidate the Veterinary Service, United States Army and to increase its Efficiency.

*Be it enacted, etc.,* that the President is hereby authorized by and with the advice and consent of the Senate, to appoint Veterinarians and Assistant Veterinarians in the Army, not to exceed two such officers for each Regiment of Cavalry and Field Artillery, three as Inspectors of Horses for the Remount Depots, one as Purchasing Officer of veterinary supplies, five as Inspectors of Meats for the Subsistence Department, three as Veterinary Examiners and Instructors, and one to act as Chief Veterinarian, not to exceed fifty-five (55) in all.

Sec. 2. That hereafter a candidate for appointment as Assistant Veterinarian must be a citizen of the United States, between the ages of twenty-one and twenty-seven years, a graduate of a recognized Veterinary College or University, and that he shall not be appointed until he shall have passed a satisfactory examination as to character, physical condition, general education and professional qualifications.

Sec. 3. That an Assistant Veterinarian appointed under Sec. 2 of this Act shall have the rank, pay and allowances of 2nd Lieutenant, mounted; that after three years of service an Assistant Veterinarian shall be promoted to the rank, pay and allowances of 1st Lieutenant, mounted, provided he passes a satisfactory examination under such rules as the President may prescribe as to professional qualifications and adaptability for the mounted service; or if found deficient he shall be discharged from the Army with one year's pay and have no further claim on the Government; that after fifteen years of service an Assistant Veterinarian shall be promoted to Veterinarian with the rank, pay and allowances of Captain mounted, after having passed such physical and professional examination as the President may prescribe; and that from the Veterinarians with the rank of Captain one shall be selected to act as Chief Veterinarian for the period of four years, and while so serving, he shall have the rank, pay and allowances of Major.

Sec. 4. That the Veterinarians of Cavalry and Field Artillery together with the Veterinarians of the Subsistence Department, now in the Army, who

at the date of the approval of this Act, shall have less than three years of service, be reappointed and commissioned as Assistant Veterinarians with the rank, pay and allowances of 2nd Lieutenant, mounted; that the Veterinarians who have over three years of service, be reappointed and commissioned as Assistant Veterinarians, with the rank, pay and allowances of 1st Lieutenant, mounted, provided they pass a prescribed practical professional examination and a physical examination as to fitness for mounted field service, or in the case of Veterinarians of the Subsistence Department, if their services have been satisfactory to the Commissary General; that the Veterinarians with fifteen years of service be reappointed and commissioned as Veterinarians with the rank, pay and allowances of Captain, mounted, provided they pass a prescribed practical professional examination and a physical examination as to fitness for mounted field service, and that they shall be entitled to credit for all honorable prior service in the Army as veterinarians or veterinary surgeons in determining their status; provided, further, that veterinarians now in the Army, who fail to pass the prescribed physical examination, due to disability incident to the service, shall be retired with the rank, pay and allowances corresponding to length of service as prescribed herein.

Sec. 5. That the Secretary of War upon the recommendation of the Chief Veterinarian, with the approval of the Quartermaster General, may appoint such number of Reserve Veterinarians as may be necessary to attend public animals pertaining to the Quartermaster's or other Departments and Corps, who shall have the pay and allowances of 2nd Lieutenant mounted; provided that such Reserve Veterinarians be graduates of a recognized Veterinary College or University, and have previously passed such moral, professional and physical examination as may be deemed necessary by the Secretary of War for the proper performance of their duties in mounted field service.

Sec. 6. That the Secretary of War is authorized to appoint Boards of Examiners to conduct the examinations prescribed herein, one member of which shall be a Field Officer, one a Surgeon, and two Veterinarians.

Sec. 7. That all laws or parts of laws in conflict with the provisions of this Act be, and are hereby repealed.

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## BRIEF

SHOWING THE NECESSITY OF THE ENACTMENT OF THE PROPOSED BILL: "TO CONSOLIDATE THE VETERINARY SERVICE, UNITED STATES ARMY, AND TO INCREASE ITS EFFICIENCY."

Inquiries into the organization and the working of foreign armies show that they all maintain Veterinary Departments or Corps, which are considered a necessary economic branch of the military service. If we examine into the nature of the various services rendered by this department of their armies, we find that it performs the following functions: The enforcement of veterinary hygiene to prevent sickness among horses; the medical and surgical treatment of injuries and diseases; the supervision of horseshoeing; the expert examination of remounts; the economic

purchase of veterinary instruments, medicines, horseshoes and horseshoers' tools; the instruction of officers, non-commissioned officers, farriers and horseshoers in hippology; the inspection of forage and of saddlery; the inspection of cattle and meat intended for army consumption; the administration of garrison—and field—veterinary hospitals; in war, the suppression of contagious disease among horses and cattle belonging to the invading army and to the people of the besieged country.

To perform these manifold duties adequately, the veterinary officers of foreign armies are required to be educated professional men, and, before entering the military service, they must undergo a special course of training in an army veterinary school to learn the particular needs of the army veterinary service. In order to secure such competent veterinarians and to keep them in the service, they have long since been given such rank and promotion as their education and services demand, and as the proportionate strength of the larger or smaller armies calls for. Whatever the size of the different veterinary corps of foreign armies may be, they are all supervised by a competent chief veterinarian; because the practice of veterinary science is so much of a specialty that it cannot be successfully directed by laymen, such as officers of other branches of the military service naturally are.

That the foreign army veterinary corps work well and satisfactorily and that the outlay for their maintenance results in true economy and is part of the proper construction of an army, is proven by the yearly statistical reports of European armies. Among the forces employed in an army not all are intended to be destructive, and among the constructive forces is an army veterinary corps. It carries within itself great economic possibilities, which have been carefully developed in all civilized armies, but remain untouched in the United States Army.

#### THE VETERINARY SERVICE OF THE UNITED STATES ARMY.

##### HISTORY OF LEGISLATION.

Not until the Civil War were efforts made to establish a veterinary service in our army. From authoritative sources we learn that "the waste of horseflesh that took place during the early part of the war was enormous (Mil. Laws, U. S.). Complaints about this unprecedented loss of horses induced President Lincoln to offer commissions as lieutenants to several of the best qualified veterinarians of that time, but they refused to accept unless they were given the rank of captain. Congress, too, grad-

ually realized the need of veterinary attendance in the army, and on March 3, 1863, cautiously enacted as follows: Each regiment of Cavalry shall have one Veterinary Surgeon with the rank of Sergeant Major, whose compensation shall be seventy-five dollars per month. While the veterinary surgeon provided for by this act was an enlisted man, yet "General Orders, No. 259, 1863, W. D., directed that he should be selected by the Chief of the Cavalry Bureau upon nomination of a regimental board of three officers next in rank to the regimental commander; the name of the persons so selected was then submitted to the Secretary of War for appointment. Notwithstanding this elaborate process devised by the War Department, it appears that the results were unsatisfactory" (Capt. Chitty). This view seems to be substantiated when we read that at the Remount Depot at Giesboro Point, near Washington, D. C., 20,000 horses were kept for recuperation, and hospital stables were erected with a capacity for 2,650 sick horses. But, owing to the lack of efficient veterinary treatment, 24,321 sick or wounded horses died or were shot at this depot from January 1, 1864, to June 30, 1866, when it was abandoned.

After all this had happened, Congress added to the army, on July 28, 1866, four more Veterinary Surgeons, with the pay of \$100 a month. Thereafter they were to be considered as civilian employees; but the rank of sergeant major was retained on their appointment certificates.

This unclear definition of the status of the veterinary surgeon, with its train of anomalous conditions, remained in vogue until 1899, and was to a great extent the cause of the periodical vacancies in the veterinary service of the army. For years attempts were made, by interested cavalry officers, to improve the veterinary service. Unfortunately, this was done more by trying to force upon the veterinarians experimental treatments, rather than by raising their position so that qualified men would enter and remain in the service. For instance, homeopathic specifics were tried in 1873; other proprietary medicines were furnished in 1876; and again recourse was taken to a regular veterinary supply table in 1879.

Finally it became clear that the veterinary service could only be improved by Congressional legislation. Consequently, early in 1888, General Sheridan approved a bill entitled: "To provide for the proper compensation and rank of the Veterinarians of the U. S. Army," which aimed to give them a commission as

second lieutenants. The General himself cut down the bill offered by the army veterinarians "to what he thought Congress would stand for." However, he died in August, 1888, and with him this bill. Similar measures were later introduced into Congress between the years 1890 and 1896, though none of them, seemingly, ever had a chance of enactment.

As a result, the Spanish-American War found the veterinary service again unorganized and feeble. The corrals at Chickamauga Park became hotbeds for the propagation of glanders among horses, a destructive disease, which was afterwards carried to civil communities of several Southern and Eastern states through the release of horses of the militia or by sale of superfluous army horses.

Again, this experience, like that during the Civil War, acted as a lever for new army veterinary legislation. Several intelligent veterinarians in civil life induced the Chief of the Bureau of Animal Industry, U. S. Department of Agriculture, to recommend to Congress a bill creating an army veterinary organization with a veterinary director as its head. This bill passed the House Military Committee, but was opposed in the Senate. In lieu a measure was adopted on March 2, 1899, providing that each regiment of cavalry shall have two veterinarians, one appointed after passing a competitive examination, with the pay and allowances of a second lieutenant, and one appointed without examination, with the rank of sergeant major and the pay of \$75 a month.

Such half-hearted legislation could accomplish but little improvement, if any, and did not appeal to the men in the civil veterinary profession who wished the army to have an efficient veterinary service. A new bill was, therefore, introduced in January, 1900, as an amendment to the Army Appropriation Bill, providing for a veterinary corps, to have a chief veterinarian with the rank of colonel, and forty-five other commissioned veterinarians in the lower grades. This bill passed the Senate on May 5, 1900, and the House of Representatives on June 2, 1900. Notwithstanding that, it was reconsidered at the express wish of the War Department, and a substitute amendment was passed, which merely abolished the grade of Veterinarian, II. Class, giving to all veterinarians the pay and allowances of second lieutenants. This law is still in force to-day.

In 1904 the army veterinarians themselves agreed on a bill asking for a commission of first lieutenant after five years of

service, and that, from among those so promoted, one be selected to act as chief veterinarian. This bill was changed by the General Staff, U. S. Army, to provide for only the pay and allowances of first lieutenant after ten years of service and the status of a commissioned officer as regards retirement, pension, etc. So altered, the bill passed the Senate twice, in February, 1908, and in June, 1910, but was never reported from the Committee on Military Affairs of the House of Representatives. One section of this bill, providing for the retirement of veterinarians, was enacted as an amendment to the Army Appropriation Bill of March 3, 1911.

#### PRESENT STATUS OF VETERINARIANS.

The official status of the veterinarian remains, therefore, as follows: He has the pay and allowances of a second lieutenant, mounted, but has not the rank of a lieutenant. He has no promotion and, throughout his service, is carried on the returns below the youngest lieutenant. He can retire on disability or at the age of sixty-four years. He is not a responsible officer and a commissioned officer must be held responsible for his professional instruments, supplies, etc. At posts without a veterinary hospital, the medicines are supplied to the troops and not to the veterinarian. He cannot sign a certificate, but must swear to an affidavit, as do enlisted men. A certificate of health for public horses for interstate transportation is not accepted by state authorities from him because he is not an officer. He is rated as a non-combatant, yet goes to the front with the troops; but is not allowed to wear a sabre, the only protective arm internationally authorized for non-combatants. The youngest lieutenant entering the army can rank him out of his quarters, although he may have many years of service and a family. His prescribed service uniform resembles that of an officer, but his dress uniform is shorn of the shoulder straps, so that he looks similar to a private of the band of his regiment. He is forbidden to wear the insignia "U. S." as collar ornaments, although he is by law a part of a regiment of cavalry or field artillery, two distinctly fighting arms. These are a few of the inconsistencies and discriminations, shameful to mention, that bitterly offend the feelings of the young army veterinarian and insult his sense of manliness.

The older veterinarian suffers most from the inequality of rank that becomes apparent after a few years of service. From

below him, out of the ranks of enlisted men or from civil life, young men are constantly overstepping him. The rejuvenation of the army is completed, promotion is rapid, and young officers are quickly advanced in rank to first lieutenant, captain or major, while the veterinarian becomes gray-haired in a stationary position that is underpaid from a professional standpoint. It is still more painful to him when young veterinarians from civil life, who come to maneuvers as captains or majors of the National Guard, admonish him for remaining in a position without rank or proper pay. This state of veterinary affairs in the army is now fully known at veterinary colleges and universities, and graduates are warned against this career. A young veterinarian may enter the army with hope and pride in his calling; but both are likely to vanish as soon as he fully comprehends his troublesome position, and the utter absence of advancement and promotion. The result is he either resigns from the army to avoid further annoyances and to seek better prospects in civil life, or, if circumstances compel him to stay in the service, he becomes indifferent, attending to his professional duties as a mere matter of routine, to the detriment of himself and the service.

Of course, there always have been army veterinarians with strong characters, who have manfully endured the iniquities of this position, and have steadily and quietly worked for the improvement of the veterinary service. From their ranks substantial and lasting improvement would come quickly if they were given by Congress a position commensurate with needed professional authority. Necessarily, rank is an essential adjunct, in an army, to perform functions, and precious little can be accomplished without it even with the best of initiative.

#### EDUCATIONAL QUALIFICATIONS OF VETERINARIANS.

The objection raised in former times against conferring rank on the veterinarian on account of insufficient education can no longer be maintained against him. He has outworked and outlived the inferior status and qualifications that some of his predecessors may have had before the Spanish-American War. Ever since that time the veterinarians themselves have jealously guarded the searching technical entrance examination prescribed under the Act of March 2, 1899. This examination extends over nine days, and is, to all intents and purposes, equal to that demanded of candidates for the commission of assistant surgeon and chaplain, and it is more comprehensive than that required

of dentists, who, after a novitiate in the army of only ten years, have now been given the commission of first lieutenant, while the veterinarian remains in the inferior status of the Law of March 2, 1899.

To banish all doubt on the question of education of veterinarians, we give below a list of the universities and veterinary colleges from which the present veterinarians have graduated:

One graduate of the Royal College of Veterinary Surgeons, London.

One graduate of the Royal Veterinary Academy, Berlin.

One graduate of McGill University.

One graduate of Harvard University.

Five graduates of Cornell University.

Five graduates of the University of Pennsylvania.

Four graduates of American Veterinary College, University of the City of New York.

Two graduates of Ohio State University.

Four graduates of the Vet. Dept., Iowa State Agricultural College.

Five graduates of Ontario Veterinary College.

Four graduates of Chicago Veterinary College.

One graduate of Kansas City Veterinary College.

Two graduates of San Francisco Veterinary College.

Graduates, 36; vacancies, 6; veterinarians of cavalry and artillery allowed by law, 42.

All these colleges are recognized colleges, inasmuch as they are compelled by state law, or by the rules governing the classification of veterinary colleges prescribed by the U. S. Department of Agriculture, to demand of their matriculants a satisfactory school education and a scientific curriculum of three or four years exclusively devoted to the study of veterinary medicine. In many instances this education is quite costly, and only young men of fairly well-to-do families can afford the outlay needed for such technical training. The educational standard of the present veterinarians of cavalry and artillery is, therefore, quite satisfactory, and fully equal to that possessed by the average army officer.

#### IMPROVEMENT THAT WOULD COME FROM THE CONSOLIDATION OF THE VETERINARY SERVICE.

If there is to be a competent veterinary service in our army, the first improvement necessary is to unite the veterinarians, now scattered among several army departments, into one technical

corps. Among the veterinarians enumerated in Section 1 of the bill are five veterinary inspectors of meats, who have been doing duty in the Subsistence Department since the reorganization of the army in 1901. They likewise are educated men, specialists in pathological anatomy and bacteriology, and general food experts. Their good work has been performed quietly, almost unknown to the army, yet appreciated by the Commissary General. No cry of "embalmed beef" has been heard in camp or garrison since their employment, because they have provided the soldier with healthful meats and meat products, thereby preventing certain diseases among the troops. The present civilian position of these meat inspectors is entirely unsatisfactory, and they should be commissioned officers to properly secure their services to the army.

The three remount stations are now provided for by the Quartermaster's Department with contract veterinarians; but if these new institutions are to develop properly and bear full fruit, only the best class of veterinarians, experts in the judging of the kind of horses desired by the army, should be secured for this detail. As in all other armies, they should be selected from the older veterinarians of cavalry or artillery, who have ripe experience, and as advisors and assistants to the purchasing officers should be responsible and commissioned veterinarians, and not civilians of questionable professional standing, who can have no proper knowledge of army needs.

The Army Service Schools at Forts Riley and Leavenworth are now provided with veterinary instructors and examiners by detail from three mounted regiments. This arrangement robs each of three organizations of one of their veterinarians, which is a just cause of complaint. Our regiments of nearly 1,200 horses have only two veterinarians, while, for instance, the German cavalry regiments of only 650 horses have four veterinary officers. None of our veterinarians can be spared from their regiments. Therefore the veterinary instructors and examiners should be specially provided for by law, as their services are greatly needed for the technical instruction of student officers, farriers and horseshoers in these army service schools, and in the bacteriological laboratory recently established at Fort Riley, Kansas.

The two actually new positions recommended in Section 1 of this bill are those of the Chief Veterinarian and the Purchasing Officer of Veterinary Supplies. These two new positions are

absolutely necessary to put the army veterinary service on a professional, effective and economic basis. Time and again have the army veterinarians requested that they be strengthened by a professional leader, who, at the same time, could be consulted directly by the War Department on the many technical and personal questions that constantly come up for consideration. These are now referred to and disposed of by bureau officers who are seldom fully acquainted with the real needs of the army veterinarian and of the army veterinary service. Because of this reason, more than from any other, has this branch of the service been treated with stepmotherly solicitude, and systematic improvement has been prevented or suppressed. It is therefore sincerely requested that this new position be finally established for the good that will come from it for the veterinary service and for the army at large. Among the seven (7) veterinarians with over fifteen years of service, who, under this bill, would be promoted to captaincies, one can readily be found to fill the position of Chief Veterinarian satisfactorily from the start.

Hardly less needed is the Purchasing Officer of Veterinary Supplies. The present system of purchase and delivery of veterinary supplies has always been unsatisfactory, defective and wasteful, because the work has not been in professional hands. It costs now twenty-five cents an animal to supply veterinary medicines, dressings and surgical instruments. With a competent Chief Veterinarian and Purchasing Officer of Veterinary Supplies going hand in hand, this item alone could be reduced to ten cents or even to five cents an animal, a saving that would not only pay for the expense of the new veterinary offices recommended, but leave a good balance to the credit of the Government. Further great savings, and improvement in the hygienic condition of public animals, would result from proper veterinary inspection of forage to prevent poisoning and indigestion among army horses; of horseshoeing to preserve their hoofs in normal shape and condition, and of saddlery and harnessing to prevent sores, all of which are at present attended to with the merest superficiality, occasioning many avoidable losses to the Government.

It is, therefore, with confidence that we recommend the approval of the several positions provided for in Section 1 of this bill, as the only means to create an army veterinary service worthy of its name and fulfilling its purpose.

The Reserve Veterinarians, recommended in Section 5 of the bill, are at present secured by contract by the Quartermaster

General. For years past the qualifications of these veterinarians have been of a lower standard than is permissible. This position is not attractive to qualified men because the position is temporary and pays only \$100 per month. Inasmuch as these men were not required to undergo an examination for entrance into the army, only such men applied as were deservedly failures in civil life. The number of contract veterinarians vary, but in 1900 there were about sixty of them employed in the Philippine Islands alone. Much complaint was heard about their incompetency, which was only to be expected, as many of them had neither studied nor graduated at a veterinary college, and charges of misconduct against them were frequent. Their services were of little value even in the treatment of the simplest and most ordinary diseases of horses and mules, and in the scientific and more serious work of checking contagious diseases they were wholly helpless, unreliable and costly employees of the Government. It is to the credit of the present Quartermaster General that he has attempted reform in this matter, and has instituted an entrance examination for this class of veterinarians which, though very easy, prevents imposters from joining the army. As these reserve veterinarians would be employed in greater numbers in case of war or other emergency, it is urgently recommended that their qualification, pay and status be raised to a more respectable standard, as provided for in Section 5 of this bill.

It needs to be stated here that the present bill is largely the outgrowth of a similar measure drafted by Major G. H. Cameron, 4th Cavalry, formerly Assistant Commandant of the Mounted Service School, Fort Riley, Kansas, and officially forwarded by him to the War Department on December 17, 1908. Major Cameron had made a comprehensive study of the foreign army veterinary services, and knew from long experience the shortcomings of our own. He had recommended, in the measure proposed by him, five veterinarians with the rank of major. Recently, officers of rank and experience have advised the reduction of this number to one, which advice has been followed.

The army veterinarians, finally, desire to assure the War Department and Congress that they do not intend to push themselves forward beyond the limits of a reasonable recognition of their services, nor beyond the limits of the proper professional standing which veterinarians should have in our army. They realize that in an army the military officer must rank first in importance and above all others, and that the representatives of

the other professions needed in the army must rank second or below him. But the present ineffective condition of the veterinary service must be shameful to every patriotic American, and should no longer be tolerated. It is high time that an intelligent, efficient and economic veterinary service be instituted in our army. This can be accomplished by giving the veterinarians a commission and the limited promotion recommended, which will surely be for the good of the mounted service, with which their work and duties are so closely identified. The number of veterinarians will never be great, therefore the cost of a veterinary corps will always be slight.

#### FOREIGN ARMY VETERINARY SERVICES.

Authentic information regarding the organization of the Veterinary Service of the foremost European armies has often been desired for comparison. In compliance, we cite below, in condensed form, the latest laws regulating the Veterinary Services of the British, German and French armies.

##### BRITISH ARMY.

(Copy in Extract.)

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, shall be amended as follows:

##### RANK.

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

Colonel, Lt. Colonel, Major, Captain and Lieutenant.

As Major-General:—the colonel holding the appointment of Director-General, Army Veterinary Department.

##### 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 may be prescribed by our Secretary of State.

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

436. Promotion to the rank of Lieutenant Colonel shall be made by selection from the rank of 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 Army Veterinary Department shall be eligible for promotion to brevet-rank under conditions 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 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.)

## 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.

## CONDITIONS OF RETIREMENT ON ACCOUNT OF MEDICAL UNFITNESS.

588. An officer of our Army Veterinary Department shall be retired from our army at the expiration of five years from the date on which he was placed on the half-pay list on account of medical unfitness, 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.

## ARMY VETERINARY CORPS.

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," as follows:

Farrier-quartermaster-sergeant,  
Staff-farrier-sergeant,  
Farrier-sergeant,  
Shoing-smith-corporal,  
Shoing-smith,  
Private.

Given at our Court, etc.,

By His Majesty's Command,

ST. JOHN BRODERICK.

ROBERTS, F. M.

Commander in Chief.

In accordance with the above warrant the "PERSONNEL OF THE ARMY VETERINARY DEPARTMENT" consists of:

(Uniform, Blue; Facings, Maroon-velvet.)

- 1 DIRECTOR-GENERAL, Army Veterinary Department, in War Office.
- 2 COLONELS: Principal Veterinary Officers, on detail with General Staff and Remount Service.
- 10 LT. COLONELS—
  - One in War Office, Deputy Director-General, Army Veterinary Department.
  - 6 Principal Veterinary Officers at Headquarters of Army Corps.
  - 3 Inspecting Veterinary Officers in India.

## 23 MAJORS—

21 Inspecting Veterinary Officers in Great Britain, India, South Africa and Egypt.

One, in Remount Department, War Office.

One, Instructor at Army Veterinary School, Aldershot.

## 47 CAPTAINS—

38 at Regimental Headquarters.

6 with Remount Depots in India.

2 Instructors at Army Veterinary School, Aldershot.

## 60 LIEUTENANTS—

57 Serving with regiments.

3 Assistants in Remount Depots.

4 as Inspectors of Meats.

10 on probation at Aldershot.

## 143 Veterinary Officers.

Besides the regular British Army Veterinary Department, there are authorized Territorial Army Veterinary Corps for Canada, Australia, etc. They consist of permanent Veterinary Corps and Veterinary Corps for active militia. Veterinarians entering these Corps must pass qualifying examinations one year after their appointment when they are commissioned to these Corps.

Candidates for the regular Army Veterinary Service must be British Veterinary graduates and pass an entrance examination as prescribed by the Director General, Army Veterinary Department. The successful candidates are detailed for attendance at the "Army Veterinary School, Aldershot," where they receive a course of instruction in equitation, in military horseshoeing, in the use of equipments and appliances for Veterinary field service, and in military law and regulations. Advanced courses for Veterinary Officers are periodically given at the same Army School, in preparation for promotion.

## GERMAN ARMY.

(Armee Veterinaer Ordnung.)

Passed the Reichstag March 17, 1910.

(Copy in translation.)

## ARMY VETERINARY ORGANIZATION.

*Article I.—Need of Veterinarians, General Duties, Supervision, Inspection.*

1. The technical services of Veterinary Officers are of great importance in the preparedness of the Army for War, particularly in preserving the health and marching capacity of horses and in the prevention and suppression of epidemics or other devastating diseases.

2. The Veterinary service of the line comprises the enforcement of Veterinary Hygiene, the Veterinary treatment, the horseshoeing, and the instruction of officers and men in hippology. Appointments are made for duties at the Military Veterinary Academy, the horseshoers schools, the remount stations, the depots for Veterinary stores for mobilization, and for administrative purposes.

3. The whole Veterinary service is under the direction of the General War Department.

4. The inspection is performed by the Veterinary Inspector General who has the rank of Colonel. He is the superior of all Veterinarians serving with the line and of the personnel detailed at the inspection bureau. On technical questions he can request special reports of Veterinary Officers attached to the Staff of Commanding Generals, or of the Professors of the Military Veterinary Academy.

5. The Veterinary Inspector General visits the various garrisons about once in two years. In these inspections he investigates the condition of the Veterinary service, the local regulations prescribed for controlling epidemics, the stable hygiene, the horseshoeing, the preparation of Veterinary records, the administration of Veterinary hospitals, the feeding and food, the meat inspection, the condition of Veterinary War Stores, etc. In these inspections he is not authorized to give orders regarding the Veterinary Service.

*Article II.—Rank, Service with the Troops, Institutions.*

The Veterinarians of the Army consist of—

1. Veterinary Officers. (Active.)
2. Probationary Veterinarians. (Detached.)
3. Reserve Veterinarians. (In civil life, with previous military training and subject to order.)

The grades of rank of Officers of the Veterinary Corps are—

1. Veterinary General (General Veterinaer) with the rank of Colonel.
2. Corps—Veterinarian (Corps stabs Veterinaer) with the rank of Major; a Corps-Veterinarian serving as assistant to the Veterinary General, ranks as Lieutenant Colonel.
3. Senior Staff Veterinarian (Oberstabs Veterinaer) with the rank as characterized Major.
4. Staff Veterinarian with the rank of Captain.
5. Senior Veterinarians (Ober Veterinaer) with the rank of 1st Lieutenant.
6. Junior Veterinarians with the rank of 2d Lieutenant.

Probationary Veterinarians and one-year-volunteer Veterinarians rank with cadets before the sergeant majors.

SERVICE WITH THE TROOPS.

62. The Veterinary Officers Corps stands next (neben) to the Officers Corps of the Army as regards rights and duties. Within the veterinary corps prevail the same rules regulating rank and precedent as apply to Army officers. Veterinary officers do not assume command of officers of the Army. Whether Veterinary officers are under the command of military officers depends upon their official position (A. R. 66).

63. Veterinary officers of a higher grade are the superiors of those of the lower grades. The Corps-veterinarian is the superior of the Veterinarians of the Army Corps; the Regimental Veterinarian is the superior of the Veterinarians of a regiment. Between Veterinary Officers of the same grade precedence is regulated by date of commission, unless one becomes the superior of others by special order.

64. Veterinary Officers are the superiors of all enlisted men; the probationary veterinarians and one-year-veterinary-volunteers are the superior of horseshoers and privates only.

65. The rules of respect and salute prescribed for medical officers apply equally to Veterinary Officers.

66. Veterinary Officers of the line belong to the Staff of their regiments. If attached to a separate battalion, train, machine-gun company or detached troop, they are under command of their Regimental Commander and of the officer commanding the organization.

69. Veterinarians report to the commanding officers of organizations such treatment as appears necessary, subject to special wishes from the military point of view. If an officer, responsible for horses, objects to proposed veterinary treatment, the Veterinarian concerned reports to the Regimental Veterinarian, who shall bring the matter before the Regimental Commander for decision. As regards execution of treatment, that is, the prescription of medicines, surgical operation, direction for nursing, etc., a Veterinarian is responsible only to his superior Veterinarian.

70. The course of treatment pursued by Veterinarians is to be based on approved scientific procedure. New lines of treatment, or such as necessitate a longer time on the sick list, require also the consent of the commanding officer of the organization. Treatment necessary to save the life of a horse, or prompt treatment in field service, is undertaken, at all times, under the personal responsibility of the Veterinarian.

71. The treatment of the more serious diseases is to be carried out in the garrison veterinary hospital, or in the field veterinary hospitals, established during maneuvers or war. Troops must be left unincumbered by unit horses. The duties of enlisted men detailed at Veterinary Hospitals are arranged by the Veterinary Officer in charge with the approval of his Commanding Officer.

72. Other duties of the Veterinarians of the line are—

1. The dispensing of veterinary medicines, and the purchase of instruments, veterinary supplies, horseshoes and tools.

2. The examination of forage, saddlery and harnessing.

3. The examination of cattle for slaughter and of meats for army consumption.

4. Post-mortem examinations.

5. Rendering of veterinary reports.

6. Veterinary instruction of officers, supply officials, non-commissioned officers, one-year-veterinary-volunteers, and horseshoers.

7. Special reports on claims of damage of civilians for horses drafted in maneuvers and in war; of spoiled forage; of spoiled meats; selection of sites for building of stables and veterinary hospitals, and such other technical questions as may arise involving the army.

76. The Corps Veterinarian is the technical advisor of the Commanding General of an Army Corps, and he attends to all matters pertaining to the veterinary service of the corps. On his own initiative he recommends such actions as he deems necessary within his sphere of duty.

84. The Regimental Veterinarian superintends the veterinary service of the regiment; he is the technical advisor of the Regimental Commander and he is at his disposal for any special veterinary service. He is to be thoroughly posted on the health and marching condition of the horses of the regiment, and has special charge of the work and instruction of horseshoers. The Regimental Commander can excuse him from personal treatment of sick horses.

#### PROMOTION, MARRIAGE, EQUIPMENT, RETIREMENT.

90. The promotion of Senior Veterinarians to Staff Veterinarians is dependent upon an examination following a course of six months at the Military Veterinary Academy. If a Senior Veterinarian fails in one or two subjects, he can repeat that part within one month without cost accruing to the Government.

91. A four months advanced course for Staff Veterinarians is given periodically as deemed necessary.

92. A two months special course for Corps Veterinarians is given as needed for the demonstration of new lines of treatment, new equipment or appliances for veterinary field service.

105. Veterinary Officers who wish to marry need the consent of His Majesty. The request has to be favorably endorsed by the Staff Veterinarian and the Regimental Commander.

107. The requirements for clothing and equipment of officers apply also to Veterinary Officers. Probationary Veterinarians are mounted by their organization.

112. The officers retirement law of 5/31, 1906, applies to Veterinary Officers.

113. The pension law for dependents of deceased Officers of 5/17, 1907, applies to Veterinary Officers.

#### AUGMENTATION OF THE VETERINARY OFFICERS CORPS.

The Corps recruit itself from:

1. Probationary Veterinarians, graduates of the Military Veterinary Academy.

2. Civilian Veterinarians who have served as one-year-volunteer-veterinarians and who wish to remain in active service.

The requirements for admission to the Military Veterinary Academy are: Certificate of physical capacity for military service; age not over twenty-one years; diploma of graduation from a classical school (gymnasium); honorable position of father in the army or civil life; agreement of terms of service; applications to be forwarded to the Veterinary General.

NOTE.—*Upon the Veterinary Officer devolve high moral, physical and technical demands in peace and war. Only such young men are to be selected for the military veterinary career who possess a high mind, tact, mental versatility, physical activity and pride in their profession.* (Margin note of His Majesty on the original draft of the bill.)

#### INSTITUTIONS.

(Now follow rules and regulations for the administration of the Military Veterinary Academy, together with schedules concerning the training of veterinary cadets until graduation, not applicable to conditions in the United States except perhaps the following paragraph):

40. The Military Veterinary Academy has a special laboratory for such hygienic and bacteriological examinations as relate to the veterinary service. Troops request the examination of forage, meats, blood-serum, post-mortem organs, etc., by forwarding samples direct to the laboratory.

The foregoing law went into effect April 1, 1910. The etat for the Prussian Army for 1910 allows: One Veterinary General, 25 Corps Veterinarians, 257 Senior Staff Veterinarians, 114 Staff Veterinarians, 168 Senior and Junior Veterinarians; total, 565 Veterinary Officers.

#### DISTRIBUTION OF VETERINARY OFFICERS.

(Uniform: Blue, facing black and maroon.)

#### WAR MINISTRY.

- 1 Veterinary General, Director of the Military Veterinary Academy.
- 1 Corps Veterinarian, Chief of Technical Veterinary Section.

#### ARMY SERVICE SCHOOLS.

- 9 Veterinary Officers of various ranks: Instructors at the Military Veterinary Academy.
- 2 Veterinary Officers, at the Army Veterinary Bacteriological Laboratory.
- 16 Senior Veterinarians, Instructors at the six Army Horseshoers Schools.
- 3 Staff Veterinarians, Instructors at the Military Riding Schools.

## HEADQUARTERS OF ARMY CORPS.

19 Corps Veterinarians, Chief Veterinarians of Army Corps.

## ATTACHED TO THE LINE.

474 Veterinary Officers with the Regiments of Cavalry, Artillery, Engineer Battalions, Train Battalions and Signal Corps.

## SPECIAL DETAILS.

26 Veterinary Officers, at the eighteen Remount Depots.

8 Veterinary Officers, at Mobilization Stores.

6 Veterinary Officers, Inspectors of Meats and Canning Factories.

565 Veterinary Officers.

The Probationary Veterinarians are not officers, and their number varies. The Reserve Veterinarians number about 500, and they become officers on mobilization. The other contingents of the German Army, those of Bavaria, Saxony and Wurtemberg have smaller Veterinary Corps organized after the pattern of the Prussian Army.

Before entering the Military Veterinary Academy, veterinary candidates must serve six months as volunteers in a mounted arm. The discipline at the Academy is military, the cadets wearing a uniform. After graduation from the Academy, the young men enter the Army as Probationary Veterinarians, in which position they remain for six months or until vacancies occur in the Veterinary Officers Corps. The election of Probationary Veterinarians to Veterinary Officers takes place by ballot of the Veterinarians of the Army Corps. If they are rejected, they must remain on probation or they can resign from active service.

The regulations for the Army Veterinary service are very strict. The results obtained by this service are excellent, and it is estimated that its cost is only one-twentieth of the value of its savings to the Army.

## FRENCH ARMY.

Article V. of the Organization of the French Army, approved December 13, 1902, fixes the strength of the Veterinary Department as follows:

| VETERINARIANS.                       | NUMBER.  | RANK.                        |
|--------------------------------------|----------|------------------------------|
| Principal Veterinarian, I Class....  | 1        | Colonel                      |
| Principal Veterinarian, II Class.... | 14       | Lieutenant Colonel           |
| Veterinary Majors .....              | 42       | Chief of Squadron            |
| Veterinarians, I Class.....          | 184      | Captain                      |
| Veterinarians, II Class.....         | 226      | Lieutenant or Sub-Lieutenant |
| Veterinary Aides .....               | variable | Commissioned Veterinarians   |

## DISTRIBUTION OF VETERINARIANS

(Uniform: Blue, facings maroon.)

## WAR MINISTRY.

- 1 Principal Veterinarian, I Class, Chief of Technical Veterinary Section.
- 1 Veterinary Major, member.
- 1 Veterinarian, I Class, member.

## SCHOOL OF APPLICATION OF THE VETERINARY SERVICE, SAUMUR.

- 1 Veterinary Major, director.
- 1 Veterinarian, I Class, Chief of Veterinary Clinic and Hippology.
- 1 Veterinarian, I Class, professor of Pathology and Military Law.
- 1 Veterinarian, II Class, professor of Bacteriology and Tropical Diseases.
- 1 Veterinarian, II Class, professor of Horseshoeing and Saddlery.

## HEADQUARTERS OF ARMY CORPS.

- 14 Principal Veterinarians, II Class, Chief Veterinarians.

## ATTACHED TO THE LINE.

- 146 Veterinarians, Field and Mountain Artillery.
- 8 Veterinarians, Colonial Artillery.
- 229 Veterinarians, Home Cavalry Regiments.
- 10 Veterinarians, Colonial Cavalry.
- 8 Veterinarians, Engineer Battalions.
- 14 Veterinarians, Train Battalions.
- 27 Veterinarians, Remount Depots.
- 2 Veterinarians, War School.
- 1 Veterinarian, Chief of Military Abbatoir.

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467 Commissioned Veterinarians.

The candidates for the Veterinary Service must be graduates of one of the three Government veterinary schools, and on passing a satisfactory physical examination, are accepted as "aides vétérinaires," and ordered for a course of instruction at the Cavalry School at Saumur, which is about the same in extent and character as that at Aldershot in England. They are then attached to the Regiments, or detailed at Remount Depots. Veterinary Depots, Military Abbatoirs, etc., as needed.

Independent of the Veterinary Corps there exists a "commission d'hygiène hippique," which consists of one Division General (President), one Brigadier General, one Colonel and three Principal Veterinarians, the duty of which is to investigate all conditions and recommendations pertaining to the preservation of the health of army horses. This commission issues from time to time a report entitled "Recueil des memoires et observations sur l'hygiène et la médecine vétérinaire militaire."

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All other armies of Europe have Veterinary Corps, organized on the same lines as those of Great Britain, Germany and France. In the Orient, the Japanese Army has a fully equipped Veterinary Corps after the British pattern. The U. S. Army is the only civilized Army in the world that has no Veterinary Corps and that continues to conduct the affairs of this department along experimental lines employed in European armies between the years 1765 to about 1823.

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## REPORT OF SPECIAL COMMITTEE ON INSULAR POSSESSIONS (A. V. M. A.).

BY N. S. MAYO, CHAIRMAN.

The United States of America has acquired colonies, or "insular possessions," without having made adequate preparations for the administration of the same. The results from a veterinary point of view have been far from satisfactory. In the Philippines the ravages caused by rinderpest and surra have been disastrous. The economic loss has been great, but the lack of method and knowledge in controlling rinderpest has seriously hindered the pacification of those islands as well as retarding the progress of agriculture and allied interests. Ten years after the islands came under our control we were establishing a suitable quarantine station that should have been one of the first things to be done. In the meantime we have trained a few veterinarians in the long, hard school of experience to deal with tropical animal diseases in an intelligent manner.

At present there is small inducement for a well educated and trained veterinarian to enter the insular service except for the novelty and experience. The pay is not large; living expenses are high and one soon gets out of touch with his friends and profession in the United States. Promotion is slow and there is little of it. The risks to life and health are considerably greater than in this country and there is no retirement or pension if the "grim destroyer" fever "gets" you. More than all this are the local political influences ever at work to nullify and destroy every effort put forth, no matter how meritorious it may be. As our insular possessions are administered by the War Department, it is evident that the insular veterinarians should belong to the army. What is needed is a well-organized army veterinary corps. The members of this corps should be young men of strict integrity, high ideals, thoroughly trained in their profession and particularly in regard to tropical diseases of animals, and they should also have one modern language. As our foreign relations will probably be intimately associated with Latin-American countries, Spanish would be preferable. With a veterinary corps trained as indicated, they would enter a country with our army prepared to take proper measures for the protection of the army horses and also the live stock of the occupied country against transmissible diseases. Quarantine measures could be immediately put in force, vaccinating and immunizing stations estab-

lished. After the need for an army has passed, the veterinarian would be able to remain and the country would still have the benefit of expert services.

With an army veterinary corps there would be definite central supervision, and the veterinarian would be free from petty local politics that is fatal to efficient work. He would be entitled to pension for disability contracted in the service and, should he live the allotted time, retired pay. He would have his foreign tour as well as service at home. This, I believe, would give us a creditable veterinary service that would be efficient and economical and would demonstrate to the inhabitants of our insular possessions that the government of the United States of America is really interested in protecting their flocks and herds that are so important to material prosperity and to peace.

THE FORTY-NINTH ANNUAL MEETING OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION will be held in Indianapolis, Ind., August 26, 27, 28, 29 and 30, 1912. Indianapolis is a capital city of about 200,000 inhabitants. It is centrally located and easily accessible to all parts of North America. The hotel accommodations are unexcelled. The Commercial Club has joined with the veterinarians of Indiana in extending a royal "Hoosier" welcome to our association.

The local Committee of Arrangements has already been organized and much of the preliminary work finished. The committee is made up as follows: Dr. G. H. Roberts, chairman, O. L. Boor, J. W. Klotz, F. A. Bolser, F. A. Mueller, W. B. Craig, R. A. Craig, J. C. Rodger, W. J. Armour, T. A. Sigler, C. I. Fleming, Wm. F. Myers, J. L. Axby and E. M. Bronson.

The Claypool Hotel has been selected as the headquarters. It is centrally located at Washington and Illinois streets, about five minutes' walk from the Union Station. "*Das Deutsche Haus*," a German clubhouse, has been selected as the meeting place. It is located at New Jersey and Massachusetts avenues, about ten minutes' walk from the hotel headquarters. The main meeting hall will seat 1,600 people. There are two other halls in the building, suitable for section work, and several smaller rooms that can be used for committee meetings. Lunch will be served each day of the meeting in the basement. The annual banquet will be held on Thursday evening, August 29, in the auditorium.

The Clinics will be held in the large operating room of the Indiana Veterinary College.

## SOCIETY MEETINGS

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### VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

#### OCTOBER MEETING.

The regular monthly meeting of this association was called to order by the president, Dr. W. Reid Blair, in the lecture room of the New York-American Veterinary College at 8.40 p. m.

The minutes of the June meeting were read and approved.

The secretary presented, through the courtesy of the owner, an odd case of glandular enlargement in a dog. This condition was first noticed in the early part of July and the glands of the throat, especially the parotid and thyroid, were the first involved, causing difficult respiration and interfering with the animal obtaining rest and sleep.

This condition of enlargement had spread to about all of the superficial glands of the body, including the submaxillary, pre-scapular, mammary, inguinal, etc. All of which could be plainly seen or felt on examination.

The animal in question was a cross-bred fox terrier weighing about 25 pounds in good condition and always had had excellent care.

Treatment had consisted chiefly of the iodides of arsenic and potash, with some relief of the throat symptoms.

This animal was examined with much interest by the members and visitors present.

Delegates and members who attended the A. V. M. A. meeting at Toronto, Canada, gave interesting reports of the same. Among those who reported having attended the meeting were Drs. Geo. H. Berns, D. W. Cochran, R. W. Ellis, T. E. Smith, E. B. Ackerman, W. Reid Blair and R. S. MacKellar.

Several members also reported having attended the state society meeting in Brooklyn.

Dr. Gannett, one of the delegates, gave an interesting report of this meeting, especially the clinics.

Dr. Geo. Berns reported on the cases operated on, and stated that the roarer operated on was doing nicely.

Dr. Jamieson stated that his case that was trephined was also doing well.

Dr. Ellis reported on an obscure case of lameness in which a number of the members differed as to diagnosis.

The "Question Box" contained the following question: "If in a herd of ten cows, two are tubercular, would the removal of *one* reduce the contagion 50 per cent.?" The consensus of opinion was that it would not.

Dr. Blair exhibited and explained an interesting photo of the heart of an ostrich, showing some peculiar pathological conditions.

Dr. Thos. Sherwood's death was reported, and Drs. Berns, Ellis and Kingston were appointed as a committee to draft suitable resolutions.

Dr. Berns invited the members to attend an operation on a roarer (Williams' method), Friday evening, October 6, and assured all that they would be welcome.

Dr. N. Peyser, of Corona, L. I., was elected to membership.

Dr. Ackerman urged that each member bring a fellow practitioner to the next meeting.

Meeting adjourned.

R. S. MACKELLAR, Secretary.

#### NOVEMBER MEETING.

The regular meeting of the Veterinary Medical Association of New York City was called to order by President Blair, in the lecture room of the New York-American Veterinary College at 8.45 p. m., November 1.

The minutes of the October meeting were read and approved.

Dr. P. V. Weaver, of Glen Cove, L. I., read an interesting and practical paper on the "Treatment of Parturient Apoplexy." This paper created a profitable discussion, which was entered into by a number of the members present.

Dr. Weaver suggested that the success of the treatment of parturient apoplexy ought to stimulate us to try and find a specific treatment for azoturia.

Dr. C. E. Clayton, of New York City, gave an interesting case report, entitled "A Case Not Labeled."

This case was one of a coach horse that while being driven one day suddenly stopped, crowded to the right side against the pole and refused to move. Was unhitched, led to stable, when it was found that he had a temperature of 102° F., pulse 45 and inclined to be hard. Diagnosed as a case of staggers and gave a physic which operated well on the second and third days. On the fourth day animal's condition seemed to be entirely normal. The night of the fifth day the horse became excited and violent and kept bearing over continually to the right and to such an extent that before being restrained he had broken down two stalls. Showing decided symptoms of acute brain trouble he was destroyed and the brain removed. On examination it was found that the left ventricle contained a hard tumor and the right a softer jelly-like mass, probably of more recent origin. Dr. Clayton exhibited the brain, which was examined with much interest by the members and visitors present.

Dr. C. Rohrer gave an interesting case report of a "Ruptured Diaphragm in a Dog."

This dog was a cross-bred Boston terrier, which on December 16, 1910, was run over by an automobile. Examination failed to show any broken bones, but the animal was weak and internal injuries were suspected. Stimulant treatment given and next day seemed to be doing well. Called again on January 4, 1911, and found the dog to be affected by dizziness after meals. Reported doing well up to February 20, 1911, when death suddenly occurred. Postmortem disclosed a rupture of the diaphragm extending diagonally about 2½ inches in length. The stomach and small lobe of the liver were forced through this opening into the thoracic cavity.

Dr. McCully, of New York City, stated that the examination of the specimens taken from the polo pony exhibited at the state meeting in Brooklyn was negative. Dr. Clayton stated that the postmortem of this case showed the lungs to be normal and finely developed, spleen large, kidneys large, ovaries large and hardened. The heart walls were thickened and the trouble was probably located in the valves of the heart, causing circulatory interference.

Dr. McCarthy reported a case of polypi in a horse which had been operated on in June, 1910, for this same condition at a clinic of this association. This animal was condemned and killed as being glandered, and polypi were found to have again completely filled the nasal passages.

Dr. Stearns brought up the point of inter-state jurisdiction in tuberculin testing, which created an interesting discussion.

Dr. Glennon, of Newark, N. J., presented a clipping from a Newark paper in which the Jersey dairymen condemn tuberculin.

The house surgeons of the New York-American Veterinary College presented a large St. Bernard dog for examination. This animal had been injured in a street accident and showed peculiar lameness of a hind limb. Several of the members examined the dog and all agreed that it was a case of stifle lameness with a probable partial crural paralysis. Stimulating liniments and nuxvomica were suggested as probably the best treatment.

Dr. J. J. Foy, of New York City, stated that he had recently had seventeen cases of so-called forage poisoning, twelve of which died. Dr. D. Cochran stated that in his opinion the cases were simply spinal meningitis. Dr. Stearns stated that in medical practice a similar condition is known as a *toxic neuritis*. This statement created an interesting discussion.

The "Question Box" contained the query "Are poly bacteria of veal or imaginary value in suppurative conditions?"

In answer to this some of the members claimed to have obtained good results and others negative.

It was unanimously decided to again hold a "Smoker," which has become an annual affair of this association, to which the members and their friends look forward with pleasure. The Smoker Committee of last year were instructed to make arrangements for this social event.

A donation of twenty-five dollars was unanimously voted toward the monument fund of Prof. S. Arloing.

A vote of thanks was tendered the contributors to the program of the evening.

Meeting adjourned.

R. S. MACKELLAR, Secretary.

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#### DECEMBER MEETING.

The regular annual meeting of this association was called to order by President Blair at 8.45 p. m.

Minutes of the November meeting were read and approved.

Dr. Clayton, chairman of the Smoker Committee, reported that the committee expected to have all arrangements for the annual smoker completed very soon.

Dr. W. J. McKinney, of Brooklyn, made an interesting case report of a riding and driving mare, used by a lady, which on being called to see it, he found to be vicious and difficult to approach to make an examination. She was standing on the toes of both hind feet and he supposed her to be spavined. Decided to fire and blister and cast animal to do so. On being released after operation she could not get up. Heart was weak, so gave strychn. sulph. gr. I., made her comfortable and left her for the night. Second day gave zii. aloin. Mare also had quite a profuse hemorrhage. On third day mare was up and viciousness had left her. This returned again in a few days and she would strike and bite if approached. At the end of two weeks she was down again, had another hemorrhage, got up and viciousness again left her. Now at the expiration of a month she is doing well.

The second case reported by Dr. McKinney was one of impaction which had resisted treatment for several days. Had been given two cathartic boluses, one quart of oil, eserine and strychn. twice, together with enemas.

The animal was then punctured with a new model trocar and  $\frac{1}{2}$  gallon of oil and saline solution injected into the bowels through the canula. Next day a free movement of the bowels took place and the animal made a good recovery.

Discussed by several members.

Dr. Clayton described a case of paralysis of the bowels in which all remedies failed in producing any action of the same. On postmortem the bowel contents were found to be in a liquid condition, so as the Doctor expressed it, if the animal had been strung up by the neck the contents ought to have emptied by gravitation.

Dr. Greissman also described a prolonged case of impaction which finally succumbed on the tenth day.

Dr. Blair made an interesting case report on "Tuberculosis in a Dog."

This animal was a bull terrier, three years old, weighing 60 pounds. Had a fight with a collie in April, followed by fainting spells. May 4, served a bitch and began to lose weight; developed pleurisy, which was treated with good results. Six weeks later again acting "off" fainting spells but appetite normal, unusual pulse.

Filari suspected but examination of blood failed to show this condition.

Anaemic—Improved on strychnine and arsenic, but had an attack of diarrhoea but no blood passed and examination failed to show intestinal parasites, lungs congested.

This dog was exhibited at the state meeting in Brooklyn and diagnosed to have dropsy and heart lesions.

Latter part of October was examined again and found to be so emaciated that the liver could be plainly felt through the abdominal wall and nodules on the same plainly distinguished, which justified the diagnosis of a probable case of tuberculosis.

On November 7 the animal was chloroformed and post-mortem showed the heart flabby, right lung congested, and numerous milliary tubercule, bronchial and mediastinal glands caseous. Liver weighed five pounds and had large tubercular lesions. Kidney also showed some milliary tubercles, spleen normal in weight with small milliary tubercles on the edge. Stomach catarrhal, large intestine contained milliary tubercles and ulcerated patches.

Examination of the tissues proved positively that tuberculosis was present, even showing deposits on valves of heart, which undoubtedly caused the peculiar heart action.

Dr. Blair exhibited the heart, lungs and liver, which were examined by all present with much interest.

Dr. McLaughlin described an odd case of long standing lameness in a dog.

The committee on resolutions on the death of Dr. Sherwood, offered the following:

Whereas, It has pleased Almighty God to remove from our midst Dr. T. G. Sherwood, a valued member of this association, and realizing the loss not only to ourselves, but to the profession, therefore be it

Resolved, That we, a committee representing the Veterinary Medical Association of New York City, do deeply deplore his loss; his amiability and sincerity having endeared him to all with whom he came in contact and, be it further

Resolved, That we offer to his family our heartfelt sympathy and that a copy of these resolutions be spread on the minutes of this association, and also a copy forwarded to the family of the deceased.

Signed,

GEO. H. BERNS.  
R. H. KINGSTON,  
R. W. ELLIS.

The annual report of the secretary and treasurer was submitted and accepted.

The election of officers for the ensuing year resulted as follows:

President, Geo. H. Berns; vice-president, R. H. Kingston; secretary and treasurer, R. S. MacKellar.

Dr. Griesmann promised a case report for the next meeting.  
Adjourned.

R. S. MACKELLAR, Secretary.

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#### CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION.

The second semi-annual meeting of the Central New York Veterinary Medical Association was held at the Vanderbilt Hotel, Syracuse, New York, on November 28, 1911, with the following members present: W. G. Hollingworth, H. A. Turner, W. B. Switzer, J. G. Hill, J. A. Pendergast, E. E. Dooling, J. M. Currie, A. J. Tuxill, R. M. Weightman, J. C. Stevens, C. R. Baldwin, F. E. York, J. S. Elliott, Wilson Huff, Frank Morrow, J. H. Stack and E. D. Hayden. Applications for membership were presented by J. Vincent Townsend, Earl W. Fitch and George D. Burton, and all were duly admitted. The association had as its guests Dr. P. A. Fish, of the New York State Veterinary College; Dr. J. F. DeVine, President of the New York State Veterinary Society, and Dr. J. H. Taylor, President of the Genesee Valley Veterinary Medical Society.

Among the matters taken up at this meeting, perhaps the most important was a discussion of the bill now before Congress to consolidate and increase the efficiency of the veterinary service in the United States Army. This measure was unanimously approved and each member was requested to solicit the support of their senators and assemblymen therefor.

The question of illegal practice was discussed, after which the Committee on Resolutions presented the following:

Whereas, There are, scattered throughout the state, men who are posing as veterinarians and, by their lack of professional training or dishonorable principles, or both, are imposing upon the public and holding veterinary service in disgrace,

Be it Resolved, That this association appoint a prosecuting committee whose duty it shall be to employ counsel and take such

action as the facts in each case of illegal practice brought to their attention shall warrant under the statute of the State of New York in reference to the illegal practice of veterinary medicine and surgery.

(Signed) E. E. DOOLING,  
J. C. STEVENS,  
J. M. CURRIE,  
Committee.

This resolution was adopted and the following committee was appointed: Dr. E. E. Dooling, Dr. J. C. Stevens, Dr. A. J. Tuxill, Dr. J. G. Hill and Dr. J. M. Currie. Dr. Dooling, as chairman of the Prosecuting Committee, later announced the selection of Merritt A. Switzer, of Oswego, N. Y., as attorney for the committee. It was decided to enter upon a vigorous campaign against illegality of practice and to that end each member of the association was requested to report to the secretary cases of this kind in their territory, and the secretary was directed to report these names to the association's attorney. Under the plan as proposed the attorney will then correspond with the men reported, giving them an opportunity to desist. In the event that this notice is disregarded, it will then be the duty of the attorney to prosecute; acting under the advice and with the assistance of the Prosecuting Committee.

The literary program of the meeting was both interesting and helpful. Dr. DeVine gave a very helpful paper on "Association Work," emphasizing the rise of the profession and the necessity of maintaining high professional standards. Particularly did he denounce the practice which was but a few years ago quite common—of feeing the grooms and coachmen of the wealthy stable owner as a means to secure his patronage. Dr. Hollingworth gave an interesting paper on "Sanitation: Meat, Milk and Dairy Inspection." "The Horse is Here to Stay" was the title of a paper given by Dr. Stevens. Dr. Baldwin, under title "Rabies in Cattle," gave his experiences and observations on five or six cases of that disease which he had personally met in practice. Dr. Morrow reviewed some very interesting cases, among them some peculiar forms of azoturia, under the title "Cases We Sometimes Meet in Country Practice." The last paper, on "Mammitis," was presented by Dr. Weightman. All drew forth good discussions and proved valuable contributions to the benefits of the association to its members.

Particular credit for the success and interest of the meeting is due to the presence and co-operation of the visitors who were in attendance. Their broad experience and differing viewpoint gave to their timely remarks on the different subjects under discussion weight and the quality of helpfulness. To them the association extends its hearty thanks.

W. B. SWITZER, Secretary.

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#### YORK COUNTY VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of the above association was held in the city of York, Pa., on Tuesday, December 5, and was the largest attended meeting of that organization in some time. Dr. C. J. Marshall, Secretary of the American Veterinary Medical Association and State Veterinarian of Pennsylvania, was the guest of the association on this occasion, and addressed its members on "Dairy and Milk Inspection, and the Necessity of Cleanliness in Order to Secure Proper Returns." Much valuable information was imparted by the doctor during his address, and he was given a vote of thanks at the conclusion of his remarks.

"Contagious and Infectious Diseases of Animals" was the topic of discussion by the members of the association.

E. S. BAUSTICKER, Secretary.

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THE Veterinary Medical Association of New York City *honored itself* in electing Dr. George H. Berns, of Brooklyn, its president at the December meeting.

DR. W. H. GRIBBLE, of Washington Court House, Ohio, and his family, traveled four thousand miles in their automobile the past summer, touring for pleasure. On their return, the neighbors of the good doctor found it difficult to determine whether his enthusiasm was greater over New York state's good roads and the beautiful scenery, or the accomplishments of his 30-horse-power "Elmore."

# AMERICAN VETERINARY REVIEW.

FEBRUARY, 1912.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, December 15, 1911.

TUBERCULOUS HEREDITY—ANTITUBERCULOUS SEROTHERAPY.—These were recently the subjects of important communications at the *Academie de Medecine* in Paris. The first was delivered by Prof. Landouzy.

Tuberculous heredity has been singularly left aside since the discoveries of Villemin and R. Koch, by which inoculability and contagion have been demonstrated. Yet many investigators have kept their attention on it, and among them Landouzy, who, as early as 1883, established the fact that the question ought to be examined into from the double point of view of the heredity by seed (*hérédité de graine*), and heredity by soil (*hérédité de terrain*). In the first, the transmission of the bacillus of Koch from the producers to the foetus (bacillar heredity). In the second, the congenital transmission of humoral, organic and functional malformations (dystrophying heredity).

The very numerous experiments of Landouzy carefully, carried out upon the hereditary transmission of the bacillus of Koch, have once more shown that this transmission is evidently possible, but it is very rare and practically can be and does remain considered as neglectable for the majority of medical

men. Congenital bacillosis, positively demonstrated in man as well as in animals, remains relatively sufficiently rare to allow the saying: "One is not born tuberculous."

Some guinea pigs, born of a tuberculous mother, well developed at birth, become diseased after a few weeks or months, even if, from the first day of their life, they have been taken away from their mother and kept in sterilized cages. Therefore it is not impossible for some cases, although very rare, of children of tuberculous parents to be born infected with latent bacillosis, tuberculosis developing only later in life. But it cannot be repeated too often that these cases are so exceptional that in practice they can be ignored and that the affirmation can be held that, properly speaking, tuberculosis is not hereditary.

With the heredity that Prof. Landouzy calls "of soil," his experiments show, as evidently possible, that products from tuberculous origin are frequently affected with important dystrophies; young ones born of tuberculous mothers died in youth in the proportion of 42 per cent.; the condition of development at time of birth is often lower than normal and their ultimate growth is often slower. Often at their post mortem, while no bacillary lesions are found, malformations of organs are observed, principally those of cardio-vascular nature, mitrate contraction, reduction in the size of the pulmonary artery, etc.—while, again, true lesions of congenital Bright's disease are found.

As conclusion, Landouzy says: "Many before us did not believe in heredity; assuredly many who come after them and have eyes only for acquired contagion, drop in an opposite excess when they fail to recognize in the congenital debility of a child, the heredity of constitution and temperament, or, when in the disqualified series of some phthisic individuals, they do not see the degeneracy of the family and that of the race."

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The communications of Profs. Renon and Guinard on anti-tuberculous serotherapy treated of the conditions necessary for

the scientific and practical value of an antituberculous serotherapy.

It is shown that although giving in clinical cases very irregular results, interesting at times, antituberculous sera are actually prepared with most different principles.

Some use exclusively soluble products or extracts of bacilli, free from all microbial elements; others employ emulsions of bacillar bodies or of living and virulent bacilli. To obtain an active serum, four, five or six months are necessary for some. Others require thirteen and fourteen months of preparation. With some, three, four or five years are required to obtain hyperimmunity of the animals. Others even tell us that the serum of animals so hyperimmunized have no curative and experimental value.

Some of the antituberculous sera now existing come from very immunized animals able to stand without effect the injection of very large doses of virulent bacilli. By opposition, other sera are obtained from animals which do not seem able to resist such test. How, then, can these non-immunized animals, able to take tuberculosis, give a preventive and curative serum?

An antituberculous serotherapy, truly scientific, ought to proceed from a unique principle of complete immunization of animals, and those ought to be refractory to any experimental tuberculosis. In man, a really specific serotherapy ought to have a positive action against all the manifestation of tuberculosis. It is impossible to judge the value of a serum with mild tuberculosis, of slow development, liable to recover alone or by simple cure of air and rest.

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PHASEOLUNATINE—ITS DANGERS.—As an additional or supplementary ingredient entering in the food of animals, it is not uncommon to find the beans of the *Vicia faba equina*, the horse bean—the kidney bean, as it is usually called. This mode of feeding is frequently used in large concerns, especially since the

introduction of sugared products. There are, however, other beans which are also found in the markets and which, if they have a pleasant aspect, and are liked by animals, it is better not to use too freely or even at all. If the kidney bean, the fruit of the *Vicia faba equina*, are scarce to obtain, others, such as the beans of Birmania, of Java or of Peru, varieties of the *Phaseolus lematius* can be given to horses in their place. Dr. Moulleron, the director of the cavalry of the Omnibus General Company, emphatically says *no*, in the article that he has published in the *Recueil de Medecine Veterinaire*.

The stock of kidney beans was used up. The recolt had been poor, beans could not be had. Other beans of Birmanya were offered, bought and given to horses in rations of 500 grams mixed with oats, corn, molasses and cut straw. The horses relished the mixture, ate it well, did well generally speaking, and worked as well as usual, keeping in good condition. The experiment made on a small number of horses proved a magnificent success, and a large purchase of beans was ordered to feed the whole stock. This was filled by the furnisher who delivered beans which came from Java and Peru. The three kinds of beans were about similar in aspect, color, condition of conservation, etc. But, as satisfactory as the first experiment had proved with the beans from Birmania, as serious and dangerous was the second with those from Java and Peru, as can be seen by the description of the manifestations given below.

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Motilleron divides the forms of the disease in three characteristics: (1) one of anorexia; (2) another, localized to the digestive apparatus with complications of laminitis, and (3) the true intoxication, with nervous manifestations and generally fatal results.

Concisely considered, the following are the symptoms of the three forms.

1. After twelve, twenty-four or forty-eight hours from eating a mess of mixed food containing 500 grams of beans, the animal is taken with true disgust for all kinds of foods, no matter what it is. This anorexia lasts for two, three or even four days. Nothing, no treatment, no care or nursing can overcome it; he will not eat. And at the same time perfect condition of health is observed. All the general functions are normal, the animals are gay, strong, ready and willing to work. After a lapse of time, from one to four days, this loss of appetite subsides and recovery is complete.

2. In this form, two or three days after the eating of the same quantity of beans (500 grams), there appear general symptoms of colics, and diarrhœa, circulatory and respiratory troubles, followed with laminitis of a most serious nature, rapidly affecting in a few hours the four extremities, with, of course, general disturbances. In the majority of cases, after twenty-four hours of greatest pains, the symptoms subside, disappear completely, and in three or four days the animal has once more free liberty of his movements. The termination is simple, resolution perfect, and without complication.

3. The intoxication is complete, even after the eating of 500 grams of beans only. Suddenly the animal refuses all kinds of food, and is taken with liquid diarrhœa, sometimes bloody, painful and with rectal tenesmus. He has violent colics, collapse, and with great nervous and muscular depression. His respiration is disturbed, accelerated, 100 in a minute. The pulse becomes almost imperceptible. Feces have a repulsive odor. There is rectal prolapsus. The animal moves with the greatest difficulty, staggers in walking and falls. Sometimes, after three or four hours of pain, paraplegia or even complete paralysis occurs. If blood is extracted, it has the aspect of asphyxic blood; dark, thick. Death occurs in coma after five or six hours from the apparition of the first symptoms.

The nervous complications are frequent. They may be present from the start, and are characteristic. The eyes become congested, prominent in the orbits, the nostrils are dilated, muscular

twitchings are observed all over. The animals lose control of their instinct of conservation, have true attacks of vertigo, push against the walls, climb in their mangers, rear, fall violently on the floor, etc. These crises generally end in death, unless, if the intoxication is not complete, recovery may occur, with, however, a convalescence of short duration, eight or ten days at the most.

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It was an important question to find out the explanation of the various series of manifestations. To realize it an analysis of the various kinds of beans causing the trouble imposed itself. The botanic examination having demonstrated that the beans belonged to the same variety, the *Phaseolus lunatus*. To Prof. Guignard was trusted the task of analyzing samples from the three different species of beans, and his conclusions were that all the beans were cyanogen, although not in equal proportions; those from Birmania are less than those from Java and Peru. There exist in those grains a cyanhydric glucoside, the *phaseo-lunatine*, which under the influence of emulsine is, in presence of water, decomposed in glucose, cyanhydric acid and acetone. And it is to this cyanhydric acid that all those toxic manifestations were due.

The history of these cyanogen beans and the accidents that follow their use in man are well known, but in veterinary medicine they are comparatively unknown, having been recorded less frequently. In Germany, Drs. Dammann and Behrens have published several observations of intoxication occurring amongst animals fed with these exotic beans. Prof. Mosselman, of Belgium, has also made known the clinical and experimental observations that he has gathered with these varieties of *Phaseolus lunatus*. And if my memory is not in error, I believe records can be found of experiments relating to this kind of food in the publications of the United States Bureau of Animal Industry. At any rate, the article of Mr. Mouilleron is calling the attention

of those who might be tempted to introduce in the feeding of horses those exotic beans, which, under a most seducing aspect, contain a poison of extreme virulence: 8 milligrams for 100 grams of grains in the Birmania beans, and as much as 102 in the others, tell of the innocuity of the first and the toxicity of the second when a meal of 500 grams of beans was taken.

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EXPERIMENTAL SCARLATINA.—The study of some eruptive diseases and especially of scarlet fever on monkeys has occupied the attention of many pathologists, and the work of Grunbaum, recorded in the *British Medical Journal*; of Cantacuzene, in the *Review of Biology of Bucarest*; of G. Bernhardt in the *Deutsche Med. Woch.*; of Landsteiner, Ledaditi and Proser in the *Bulletin de l'Academie des Sciences*, and of L. Hektoen and G. H. Weaver in the *Journal of the American Med. Assn.*, with many others, show how great is the attraction that the subject offers, and although I have already alluded to this question in my *Chronicles* of last October, I will present a *résumé* of an article which has been published in the *Presse Medicale* by Dr. A. Gouget.

To isolate the pathogenous agent, and experimentally reproduce the disease, constitute the double object to obtain in the studies of the etiology of infectious diseases. As far as scarlet fever is concerned, the question of its pathogenous agent remains yet unsolved; as the opinion which considers it as a streptococcus has too many contradictors. It appears, however, that the experimental reproduction of the disease is possible; several authors have announced that positive results have been obtained with monkeys, which up to this day appears to be the only animal sensitive to the scarlatinous virus.

These discoveries are recent and have been published only a few months. They have been, however, preceded by those of Grunbaum, who, in 1904, attempted to transmit human scar-

latina to chimpanzees. To that effect he used the shirt or the bed sheets of diseased individuals, the peelings, the products of the washing of the throat, the cultures of *Streptococcus conglomeratus*, and even the blood of the heart secured shortly after death. He obtained only one positive result. A chimpanzee had his throat coated and rubbed with the washings of that from a scarlatinous patient. Four days after, he had a "doubtful" roseola, but without fever; the next day white spots over the amygdalae with slight febrile reaction, followed by exudates. The roseola was principally developed on the abdomen, but did not have a scarlatinous appearance. The sore throat subsided and after three days of slight fever the temperature became normal. *Streptococcus conglomeratus* was isolated from the the throat of the chimpanzee. The case was positive but insufficiently demonstrative.

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Cantacuzene resorted to subcutaneous or intravenous injections in various species of monkeys, inoculating either blood taken from living patients during the first hours of the eruption, or pericardiac serosity or an emulsion of tracheo-bronchic glands obtained between three and four hours after death. Nine monkeys were inoculated. Of those, one had pericardiac liquid, another glandular emulsion, and the other seven subcutaneous injections. The two first gave a negative result. Of the balance, two died, one had only a local abscess, and the four others, which had also been inoculated with blood, emulsion or cardiac fluid gave positive results: "After a varying lapse of time after the inoculation, the temperature rose to  $40^{\circ}$ , stayed between  $40^{\circ}$  and  $41^{\circ}$  for two or three days, and then dropped to normal. In the same time appeared a purplish eruption, uniform on the forehead and face, and spreading sometimes to the forearm. It faded away after thirty-six hours. Then came a desquamation on the face, the back and the tail. It was lighter on the legs. There always was adenitis, generalized to the inguinal

axillary and cervical regions. This lasted a long time after the acute phenomena. There was a great polynucleose at the beginning of the eruption and eosinophilia at the end. No streptococcus was found in the cultures made with blood and pericardiac liquid.

Similar results were also observed in the experiments carried out by Bernhardt, with the monkeys that he inoculated with the white coating of the tongue of scarlatinous patients, making with it an emulsion with physiological water and injecting it in the inguinal region under the skin while at the same time the mucous membrane of the cheeks and the tongue were rubbed with the same emulsion. The symptoms were very similar to those found by Cantacuzene. Besides these, Bernhardt succeeded in reproducing similar characteristic symptoms with scarlatinous virus passed three times in succession from monkey to monkey. It is to be noticed that in this last experiment, while in the animals of the first passage the glands often contained streptococci, there were none after the third and yet the glands remain virulent. More recently Bernhardt has succeeded in reproducing the same clinical manifestations after eighteen days of incubation, by rubbing the buccal mucous membrane of monkeys with the scrapings of the scarlatinous tongue.

From the experiments of Cantacuzene and of Bernhardt, it is evident that the presence of streptococcus must be put aside as being the specific agent of scarlet fever.



Besides these series of experiments, positive in fact, others must also be considered, even if they are contradictory.

Landsteiner, Levaditi and Prasek have resorted to a mixed method on chimpanzees. One of these animals had its throat coated over several times with the blood taken from the amygdalae and pharynx of scarlatinous children; in a second animal the coating was done with the exudate of a scarlatinous sore throat and a subcutaneous injection of scarlatinous blood; with a third the exudates from the amygdalae of the second animal

were used and the following day an injection of blood from this same second monkey, and finally the other chimpanzees had their throats swabbed and a subcutaneous injection made of cultures of streptococci made with material from the throat of the second chimpanzee and blood from a scarlatinous patient.

The result of these fixe experiments was negative except one, which even the authors do not affirm to have been a reproduction of scarlet fever.

In their experiments, Hektoen and Weaver selected the digestive canal for inoculation. From the secretions of the throat and mouth of scarlatinous children collected with cotton swabs, and which were washed with milk, thirteen monkeys were fed. Ten remained perfectly healthy and three died. Result rather negative.

If lame conclusions can be derived from this brief review of some of the experiments made, it seems that those of Cantacuzene and of Bernhardt are the most demonstrative. If further experiments should come and confirm them, two precious facts will have been established: first, that monkeys are the true animals for the study of the etiology of scarlet fever, and second, that streptococcus must definitely be ignored as the causal pathogenous agent of this disease.

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CONGRESS OF COMPARATIVE PATHOLOGY.—Since some ten years a Society of Comparative Pathology has been organized in Paris, and has met with considerable success. Holding monthly meetings, it counts among its members veterinarians and physicians, many belonging to several of the schools of human and veterinary medicine, and the list of its honorary and active members compares advantageously with that of any other scientific organization. At the meetings papers pertaining to both branches of medicine are presented, and the *Revue de Pathologie Comparée* is the organ where all the work of the society is published.

The first organization of this kind in France, and, I daresay,

the only one which has succeeded, it has decided to make a powerful effort and to organize an *International Congress of Comparative Pathology* to hold its meeting in October, 1912. So far only the foundations are being laid down, and before publishing the program a letter has been directed to a large number of veterinarians and physicians asking them to co-operate and send their adhesions to the congress, with also a few inquiries such as to what questions seemed to be the ones to be discussed, whether communications could be expected, etc.

The general secretary of the society, Mr. Grollet, 42, rue de Ville, has a hard task before him, but if energy and ability are the necessary elements for the success of the congress, it is sure to be great and of very valuable importance to comparative pathology. I will have opportunity to refer to this as soon as the official program is published.

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BIBLIOGRAPHIC ITEMS.—Prof. J. A. Gilruth, D.V.S., M.R.C.V.S., and Georgina Sweet, D.Sc., of the Melbourne University Institute, have written a long article on "*Onchocerca Gibsoni*, the cause of Worm Nodules in Australian Cattle," which has been published with the addition of "Notes on Worm Tests in Australian Cattle and in Camels," by Dr. J. Burton Cleland, M.D., and E. Harvey Johnston, M.A., both from Sydney. The whole forms a pamphlet of some forty pages, abundantly illustrated, where the history and distribution of the disease in Australia are given with also the pathological history, macroscopic and microscopic appearance, the structure, development, life history, bibliography, etc.

"A Simple, Effective and Inexpensive Method of Treating the Arsenical Dipping Solution Before Emptying Vat for Cleaning" is a communication published in form of pamphlet by Dr. W. H. Dalrymple and A. P. Kerr, of the Agricultural Experiment Station of Louisiana.

COMMUNICATIONS ACKNOWLEDGED.—Dr. Robt. Dickson, of Fair Haven, N. J.—*Quarterly Bulletin*, Chicago Vet. College.

September, 1911.

A. L.

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### PENNSYLVANIA POINTS THE WAY.

On other pages in this number, we print an open letter sent to the Governor of the "Keystone State" by one of the members of that state's board of veterinary medical examiners who, after sixteen years of loyal service, was not reappointed because of his political convictions, and because a once powerful, but tottering political machine required more pliant men, that sinister political influences might be better served.

We have frequently pointed out this one great danger of every state board under our political system, and now that the one state, that has withstood for sixteen years this peril, has at last under purely political exigencies fallen from its high state of advancement, it only repeats what has followed in many other states where state laws have been enacted.

Doctor Hoskins does not suffer personally, but the profession of his state (98 per cent. of which asked for his retention), is humiliated, and efforts to continue a high and equitable standard to every applicant, and to enforce the law without fear or favor, menaced. It has already borne fruit in that there are now two standards in that state—one for law breakers, and one for the young, rising, ambitious graduate.

It surely establishes beyond peradventure the greater need of a Federal license (as recommended by Dr. Hoskins to the *Association of Faculties and Examining Boards* at the forty-seventh annual convention of the American Veterinary Medical Association at San Francisco, California, in 1910, and with which we were much impressed at the time), that shall give to American veterinary medicine a fixed and definite standard under civil ser-

vice regulations, that shall be a saving grace to all our state laws, and fix our standard at home and abroad beyond the dangers of corrupt political machines or the sordid, selfish power of any one man.

Dr. Hoskins points out the danger and fearlessly with his pen endeavors to preserve the manhood, self-respect and political independence of his colleagues in the profession.

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### ARMY BILL NO. 16,843 AGAIN.

In our last month's number we gave a considerable amount of space to the publication of Bill No. 16,843—" *To Consolidate the Veterinary Service, United States Army, and to Increase Its Efficiency* "—and to a considerable amount of data calculated to instruct the veterinarians of the United States on the various aspects of the questions at issue, and to enthuse them into action. Matter published in the " *Army Veterinary Department*," and reports of society meetings in the present issue, clearly demonstrates the fact that many of the veterinarians throughout the country were *already* in action; and from comments in letters recently received from all over the country, we are gratified to learn that the space devoted to the *Army Veterinary Bill* in the January number of the *AMERICAN VETERINARY REVIEW* had the effect of enthusing men who had not realized the veterinary conditions in the army, or that an active campaign was being waged for their betterment. Those were just the men we wanted to reach, in addition to *increasing* the enthusiasm of those already at work; and results obtained have prompted us to extract from a report of the organization of the *Canadian Army Veterinary Service*, with the hope of further stimulating the veterinarians of the United States, to the end that we shall get from the present Congress what Bill No. 16,834 asks for our brothers in the army.

Our late receipt of the Canadian matter necessitates that our extracts from it be scattered throughout the number.

## ORIGINAL ARTICLES.

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### THE VETERINARIAN AND POISONOUS PLANTS.

BY D. ARTHUR HUGHES, LITT. M., PH.D., D.V.M., CHICAGO VETERINARY COLLEGE.

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To the veterinarian in the rural regions poisonous plants are frequently a source of difficulty, because animals are injured by them and because he commonly is ignorant of the dangers arising from them. He finds himself called to see an animal presenting symptoms of poisoning, the cause of which he cannot guess, until, perhaps by chance, he observes the fodder on which the animal has been fed, or makes an observation of the land upon which the animal has grazed, to be driven to the conclusion that poisoning likely has taken place from ingestion of a noxious plant. But he is not positive of his diagnosis. The symptoms are unusual, or at least there is difficulty in determining the cause; the seriousness of the condition is obvious; the death of the animal comes all too soon without a chance to arrive at a positive opinion on what the poisoning may be.

From the standpoint of the study of poisonous plants, and that of the desire to obtain information of value on plant poisons and poisonings, the difficulty is increased by the meagreness of the present knowledge of such plants and the sparseness of the records of such poisonings. Surgical case reports, parasitological or obstetrical case reports, are common enough; but case reports of poisoning from noxious weeds are a *rara avis*. We know that poisonings from eating noxious plants are common; yet the records of them are not made, at least not published. I have frequently been the recipient of letters from students making

inquiry about supposed poisonings. But the information furnished is usually scanty and the questions wide of the mark—a scrap of history; a line or two on symptoms; a piece of the suspected plant and a question as to the harmfulness of the plant. The rural veterinarian, like his city brother, is apt to do things in a hurry. Specimens of plants sent in for examination are transmitted oblivious of the fact that specimens of the whole plant in bloom are usually necessary in order that determination can be made of what they are; besides, the roughness of handling of packages in the mail should be borne in mind, else packages of specimens may arrive as a mass of dry, disintegrated vegetable matter instead of in intelligible shape.

The usefulness of the study of poisonous plants must, from these observations, be manifest to practitioners in country places. Sooner or later they are sure to be confronted with problems of the determination of the name, descriptive character, peculiarities and possible toxic nature of plants in the regions where they practice, and they are apt to be at sea and puzzle-headed without that information in case poisonings occur. There are so many different ways that poisonous plants become troublesome to practitioners, and the troubles are so grievous to the owner, that appeal is sure to be made to the veterinary expert. Numerous poisonings of stock occur from cutting and garnering noxious weeds when hay is cut in the meadow and by serving this up to animals, the owner being unaware of the danger to his stock. Poisoning from lupine hay, for example, occurs in this manner, and sheep are carried off by the carelessness or heedlessness of persons having no knowledge of the characteristics of this plant, and the toxicity of it under certain conditions—before the ripening of the seeds in the pods—lupinosis being the result. Again, many poisonings are brought about by permitting animals to forage on harmful plants in the open, especially in those unpropitious seasons of the year when little herbage but the green leaves of such plants as the purple or white loco weeds can be found for food. The worst of it is that many poisonous plants on which animals may crop are not at

all distasteful to their palates; indeed, many are succulent and attractive, so that animals eat and keep eating to their own destruction. There are also many instances of poisoning by accidental eating of poisonous plants, for example, the eating of oleander leaves by horses driven up and tied to posts near lawns on which the oleander is in bloom, the result being a poisoning simulating digitalis poisoning; or when cattle or sheep accidentally browse upon the beautiful mountain laurel, another favorite of the lawn, which, when eaten, rapidly produces death.

Undoubtedly poisonous plants should be made a branch to be taught as part of every veterinary college curriculum. But when and how? The ideal way is to have the study of poisonous plants preceded by at least a modicum of descriptive and physiological botany sufficient to give the student some knowledge of classification and arrangement of plants by means of analysis and the gathering of an herbarium, together with information on the functions of plants in part and whole and the organic materials that are formed by them; which is the basis of materia medica. The study of poisonous plants may then be taken up in earnest by means of laboratory and field work, and by means of lectures on at least the most important poisonous plants—those widely destructive to domestic animals, such as loco weeds, larkspurs, lupines, poisonous hemlocks, death camas and the like. The veterinary student cannot be expected to take much interest in botanical technology, in purely botanical knowledge that runs foreign to his particular desires and aptitudes, which instinctively compel him to confine himself to such plants and such botanical knowledge as will help him in his everyday practical service of the public. The lecturer on poisonous plants, therefore, should, as far as possible, devote his attention to widely destructive plants, the amount of harm they cause; the appearance of the plants and means of identification; the symptoms of the poisonings; the course of the poisonings; the post-mortem appearances; medication and preventive measures. This must be the work of a veterinarian rather than a botanist; for it is the veterinary aspect of the case which rightly appeals to the veterinary stu-

dent, and this is more apt to be dealt with successfully by a veterinarian than by a man whose inclinations are towards botany purely, rather than towards the adaptation of a knowledge of poisonous plants for the purposes of the veterinary art.

It is true, as I said in a paper on poisonous plants written for this journal several months ago, that the curricula at the veterinary colleges are suffering from congestion, or at least they are plethoric with the new blood which has been given them with the standardization which has come since the U. S. Department of Agriculture began to take a hand in their work. Yet it seems to be generally agreed that the study of poisonous plants must be given a place even in the present congested curricula. How much the more time can be given to this branch when the curricula are made longer and the length of the courses extended to four or more collegiate years. The popularization of the subject is easy, especially if a man confines himself largely to widely destructive plants. Lectures on poisonous plants, of the kind that I have mentioned, given by an enthusiastic lecturer, with a pleasant delivery and facile speech, cannot help but arouse interest and inform the students. Demonstrations of plants by the aid of an herbarium, photographs, photogravures or electro-types, and charts are helpful. Quizzes, oral and written examinations, will stimulate the student to industry and cause him to devote some time to the theme.

This leads me to offer a few suggestions to practitioners. The first is regarding sending specimens of plants, believed to be poisonous, by mail. Whenever the rural practitioner is in a quandary as to the harmfulness or harmless nature of plants in his region; whenever he suspects certain plants to be noxious, or whenever he is disposed to attach blame to one or another of them for constitutional injuries he finds in an animal or animals in his region, there are means of ascertaining the facts or of putting authorities in the way of learning the facts by examination of specimens. The United States Government has a laboratory devoted to the determination of the cause of poisonings, of

the study of poisonous plants, where the best facilities are at hand for the study, and where information can be had which will be of value. Specimens may be sent to Dr. Rodney A. True, Physiologist in Charge of Poisonous Plant Investigations, Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C. He will be glad to offer assistance in a dilemma. Most of the state experiment stations also have experts on their forces who can be of assistance in case of need. A letter asking for information addressed to the Director of the State Agricultural Experiment Station will bring results. There is a further value in this, that by this means the botanists of the States can keep in touch with needs of the farmers in the determination of poisonings caused by plants and can be of service to the professional men in this matter. Furthermore, the veterinary colleges are more and more giving some time to imparting instruction on poisonous plants, and they, no doubt, will invite correspondence on the subject. They are willing in every way in their power to give aid where it is needed. In sending specimens the transmitter should bear in mind that he should give all aid possible to the person to whom the plant is sent to enable him to arrive at a correct determination of the noxiousness or innocuousness of the plant. Usually the specimen should include the whole of a plant whenever possible. If the plant is small, it would be easy to compress it carefully and send a sample including flowers, leaves, stalks, roots. If the plant is large, samples of flowers and leaves should be sent together with information on the plant in general. Knowledge of the seeds also is at times necessary. The common name of the plant given to it in the region should also be furnished. The common or popular names of plants in different regions vary, though when this information is furnished it may be helpful in making the determination. The package should be wrapped and tied with such care as will prevent the plant from being broken up in the mail. My experience teaches me that persons transmitting specimens, from their anxiety and hurry to get information, forget to exercise sufficient care in transmittance and so make it im-

possible for the receiver of the plant to make a determination of its identity, nor can he be accurate about his answer.

Practitioners are beginning to seek printed information on poisonous plants, and it is high time that more appeared in our veterinary journals which will be useful to them. A certain amount of journalistic literature on poisonous plants is sporadically appearing, including short pamphlets which are commonly preliminary and not careful, exhaustive studies of plants. These are apt to be of a fugitive nature, to use the German phrase, and the information they furnish is sparse, though they may be very suggestive of work to be done. For example, about two years ago, a short bulletin on the garden oleander was issued by the Arizona Experiment Station, in which many facts were brought out about the dangerousness of that beautiful lawn plant to horses and goats. Again, an article on woody aster poisoning of sheep, from a station in the Rocky Mountain region, also excellent in its suggestiveness, has appeared; neither of these, however, are complete studies of the subject. A better grade of papers on poisonous plants is to be found in the United States and Canadian Government Reports. In the annual reports of the Bureau of Animal Industry are to be found splendid studies of many poisonous plants which destroy the various species of domesticated animals. The work of Chestnut and Willcox in those reports are among the earliest and best studies of plants poisonous to animals. I have the good fortune to possess a full set of the annual reports of the Bureau of Animal Industry and I have occasion to frequently refer to them for information on poisonous plants. The Canadian Reports of the Veterinary Director General and Live-Stock Commissioner, also printed annually, are becoming more useful to the live-stock industry every year. For example, in one of the most recent ones, that for 1909, occurring as Appendix No. 10, by E. A. Watson, V.S., there is a most excellent account of loco weed poisoning in Canada and investigation of it at the Quarantine Station, Lethbridge, Alberta. The article is illustrated with photogravures of equines and bovines in various stages of the

loco weed poisoning. However, it is difficult for the veterinarian in the hurly-burly of private practice to become informed of the outing of these articles; nor is it possible for him to read many of them, lengthy as they are, when they do appear. There are digests printed of articles on other branches of veterinary medicine found in current veterinary literature; why should not digests of articles on poisonous plants appear? There is a good reason why this is not done. Few persons are acquainted with poisonous plants; can identify them; know their harmfulness; or can produce the digests needed.

There is, therefore, an obvious necessity for the practicing veterinarian to lean on some manual, in order to prevent himself from being at sea when cases of poisoning occur. How does the necessity arise? There are many individual cases of death of animals which, because of the attending circumstances, cannot be otherwise than ascribed to plant poisonings. Suspicion is cast upon certain plants upon which the animal was known to feed for days or weeks previous to his death. These plants, it may be, are suspected in the neighborhood of being poisonous, and circumstantial evidence is at hand that death occurred from ingestion of the plants in question. Again, a large share of a flock or a herd may be decimated when being driven through a region where one or another of the poisonous plants abounds, as has frequently been the case with larkspur poisoning in that part of the central West east of the Rockies, where delphinosis is common. How is the veterinarian consulted to know the cause of death, especially if he is inexperienced, unless he has information on poisonous plants, or else can obtain it from some reliable manual? Lawsuits are sometimes started by enraged owners against railroad companies for permitting animals in transit to be fed and watered at a point where such plants as larkspurs flourish. I have in mind just such a case where a railroad company seemed to be liable for the death of a large share of a flock of sheep in western Nebraska, which occurred, presumably, from eating larkspurs.

What, then, is to be the helpful work of reference which will be of greatest service in these emergencies? One of the difficulties in the way of priming men on plant poisonings has been, up to the present time, the absence of any publication which contained enough and was extensive enough to be of any value. Happily, we have now a work on poisonous plants, encyclopedic in character, which can be cordially recommended as a work of reference for the profession. I am speaking of that monumental work just completed by L. H. Pammel, Ph.D., Professor of Botany, Iowa State College of Agriculture and Mechanic Arts, entitled "A Manual of Poisonous Plants, Chiefly of Eastern North America, with Brief Notes on Economic and Medicinal Plants and Numerous Illustrations."\* Dr. Pammel was a man of large reputation as an author of articles and treatises on poisonous plants long before he undertook the task of writing his encyclopedic manual. He had catalogued the poisonous plants of Iowa and had written pamphlets and monographs on regional medicinal and poisonous plants. One of the most recent of these was his well-illustrated bulletin published by the State Department of Agriculture, entitled, "The Medicinal and Poisonous Plants of Missouri," which received favorable comment from Dr. Glover, of Colorado, in his presidential address before the American Veterinary Medical Association at Toronto last summer. A man of such aptitudes was bound in time to find fellowship with a profession which has to do with the detection of poisonings caused by plants in animals. Consequently, Dr. Pammel has always been a friend to the veterinary profession and has done much in Iowa and Missouri to point out to them harmful plants and to catalogue them for them. Time is an increment in the preparation of so large a work as Dr. Pammel has written. A man does not write his *magnum opus* in a day.

\* A Manual of Poisonous Plants, Chiefly of Eastern North America, with Brief Notes on Economic and Medicinal Plants, and Numerous Illustrations, by L. H. Pammel, Ph.D., Professor of Botany, Iowa State College of Agriculture and Mechanic Arts. Part I.—General Treatise on Poisonous Plants. Part II.—Key for Plant Kingdom. Catalogue of Poisonous Plants. Bibliography of Poisonous Plants. Index. Containing 977 pp., octavo. Green cloth. Black lettering. The Torch Press, Cedar Rapids, Ia., 1917.

And Dr. Pammel has taken many years to prepare this work. Indeed, it is something like two years ago since the first part of the work was issued from the press, and when it was our pleasure to comment upon it in the *AMERICAN VETERINARY REVIEW*. A work of so great a magnitude must also necessarily be lengthy.

A primer on poisonous plants would have little usefulness for the veterinarian. What he wants is a comprehensive work on the subject to which he can hastily refer to determine, if possible, the name of the plant he suspects, its known danger to our animals and the effects it causes so far as they are known. In his "foreword," or prefatory remarks, Dr. Pammel acknowledges that much of the literature on poisonous plants is scattered and hard to obtain, and he states that he has made an effort to bring together in his pages the results obtained. This, indeed, is just what the busy veterinary practitioner would expect of him and would look for in a work of this character. Elsewhere he states that many persons would object to the great number of plants which are regarded in his work as poisonous. He has rightly placed the broadest interpretation on the subject and has included in his work all plants that are injurious, although many of them are not known to produce poisons, some of them being most useful economic plants, yet injurious to people, and he should have added injurious to animals.

Pammel's book will be a boon to the veterinary practitioner in the country communities, and will, in time, find its way into the libraries of many veterinarians who aspire to a successful country practice. It is not a work to be read page by page or devoured with that fervidness with which city ladies are observed to devour the latest novel. It is a work of reference, covering, in almost a thousand pages, the facts as they are known to-day about poisonous plants. It takes up, in almost bewildering detail, such subjects as bacterial poisons, dermatitis, forage poisoning, fungi poisoning, equisetosis, locoism, lupinosis, delphinosis. In fact the whole field of poisoning is covered. Even we find a classification of poisons; remarks on the production of poison in plants; on the chemistry of alkaloids and glucosides.

and a catalogue of the most important poisonous plants of North America. So comprehensive a work is sure to have special features, and these in Pammel's large volume consist of a key to the plant kingdom to enable one to determine the family to which a poisonous plant belongs; a catalogue of the poisonous plants of the world, as far as they are known; a complete bibliography to all the literature accessible on poisonous plants, and an index to the whole work.

Dr. Pammel's work is to poisonous plants of North America what Ostertag's work is to meat inspection or what Neumann's work is to parasites. This will give some notion of its comprehensiveness. The work is not meant, apparently, to be a textbook, as perhaps Ostertag's might be if a lengthy course on meat inspection were to be given. It is bulky, resplendent with detail, and encyclopedic in its expansiveness. Its merit is that it is a book to be kept on the shelf, and looked into when occasion calls for reference to it, when tough situations arise of suspected poisonings. Its deficiency is due to the ignorance of our times. The veterinary profession has much to learn about poisonings caused by organic materials in plants. Our veterinary literature is weak in its records of cases of poisonings caused by plants, the causes, symptoms, and post-mortem findings. Pammel has endeavored to assemble the facts from medical and veterinary literature covering plant poisonings, and these facts are put in their proper place in his work under the different plants. But the truth is much lacking, owing to our own deficiencies. The gaps will have to be filled in as time goes on when more records will be made of cases of poisoning in veterinary literature.

What, now, does the appearance of such a work as this by Pammel suggest on poisonous plants as a field of study?

There can be no doubt that many plants cause poisoning of domesticated animals; still less can we doubt the seriousness of many of the poisonings when they occur. There is an absence of clear-cut descriptions of the symptoms, course, post-mortem findings in these poisonings, and little known of medication or prophylaxis. There are a few forms of poisonings of which we

know something—such as locoism, delphinosis, hemlock poisoning, lupinosis, ergotism, mountain laurel poisoning. Too few post mortems are carefully made. Accurate descriptions of symptoms are not recorded. Enough curiosity is not aroused to discover causes of poisoning. The chemistry of plant poisons is in its infancy. This field is bound to broaden as is indicated by our present ignorance. Manufacturing chemists have exhibited a fearful neglect of plants now called poisonous, which will prove to be medicinal plants with many virtues in the alleviation of disease when their merits have been studied, and can become utilized in therapeutics. Many plants are suspected of being poisonous to animals in the regions devoted to live-stock raising. In many instances determination has been made, through reports of individual cases of poisoning, that many plants are toxic, though it is far more difficult to determine the actual cause of the toxicity. This can only be discovered by tedious and painstaking investigations, extending, in many instances, over years. The path of the student of plant toxicology is beset with many difficulties, as many plants only in part are toxic; or only in certain periods of their growth; or under conditions of decay; or because of alterations in their substance produced by seasonal conditions. But much earnest work is being done to discover the plants that are poisonous: the conditions under which poisoning takes place; and the cause or causes of the poisonings. Though there are difficulties in the way of the determination of poisonings caused by plants, the study is of practical usefulness. It may relieve the veterinarian from many embarrassments and secure for him new medicaments, widen the field of materia medica and therapeutics.

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THE B. A. I. VETERINARY INSPECTORS' ASSOCIATION held their monthly meeting on December 18. Peculiar cases found on postmortem inspection and many other questions of interest are discussed at these meetings, making them profitable to members.

Two subjects discussed at length were: "Proper Manner to Conduct Postmortem Inspection in Order to Detect Beef Measles," and "The Importance of Ante-Mortem Inspection of Hogs Affected with Cholera."

## ARSENICAL POISONING FROM SMELTER SMOKE IN THE DEER LODGE VALLEY, MONTANA.

BY D. E. SALMON, D.V.M., MONTEVIDEO, URUGUAY.

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### V.

#### ACCUMULATION AND TOLERANCE OF ARSENIC.

*Arsenic Trioxid in the Bones.*—A very clear example of accumulation in the bones is furnished by a mare on which autopsy was made August 15, 1906, being No. 38 of our series. The animal was a large, fine-looking roan, about eight years old, in good condition of flesh, and weighing about 1,300 pounds. She belonged to a farmer whose ranch was located about 12 miles north of the smelter, and who stated that the animal had fed mostly on hay, but occasionally was pastured. For nearly a year he had noticed a progressive loss of strength, which had reached such a degree that she was no longer able to work, as was shown by profuse perspiration, weakness, evident suffering and complete exhaustion when the effort was made to utilize her services.

An examination revealed difficult respiration, carried on largely by the abdominal muscles, bronchial râles and weak action of the heart. As the owner said the animal was of no value to him, she was killed by shooting, and an autopsy made immediately afterwards.

The fat was very yellow. There was considerable effusion in the peritoneal cavity and several ounces in the pericardium.

The lungs showed thickened pleura, and some exudate on the lower, anterior and median portions. There were, also, two small areas of pneumonia, several hæmorrhagic spots, and many of the finer bronchi were plugged with mucus. The heart was firm and weighed  $7\frac{1}{4}$  pounds; the liver weighed 17 pounds, the

right kidney weighed  $2\frac{1}{2}$  and the left  $2\frac{1}{4}$  pounds. Considering the size of the animal, the heart and liver may be considered of normal weight, but the kidneys were evidently considerably enlarged.

On section, the cortical substance of the kidneys was pale in color and the glomeruli showed on the cut surface as small, blood-red spots. The medullary portion was red. There was a thick, albuminous liquid, carrying a white substance in suspension, in the pelvis, and a similar material oozed from the cut surface of both the cortical and medullary portions.

The pyloric portion of the stomach was very red and inflamed. The small intestines were congested in many places, there being several deep red patches at least a foot long. Both the serous and mucous coats of the colon were red, and the latter was covered with a layer of brown pigment which was probably the remains of a hæmorrhage of several days' standing. The cæcum was deep red throughout, with numerous erosions. The uterus and bladder were congested. The brain was slightly congested.

On making a longitudinal section through the femur and humerus, the compact bone at the surface was found to be exceedingly thin, while the spongy tissue seemed to be in a degenerated condition. In the median portion there was a soft, pasty, bloody mass, and in the other parts the spaces were filled with free, yellow, transparent oil. The appearance led to portions of the bone being taken for analysis, the result of which was that, whereas the liver carried but 4.99 parts of arsenic per million, these bones carried 20.67 parts, or more than four times as much. This large quantity of arsenic in the bones is probably unusual and especially worthy of note.

A microscopical examination of the urinary sediment revealed considerable renal epithelium.

This animal had evidently been suffering from chronic arsenical poisoning for a long time, but the symptoms recently had become more acute. Whether this was due to a larger quantity of arsenic in the food, to the disease of the kidneys having

progressed to a point where the poison was not so readily eliminated, or to the greater accumulation of arsenic in the tissues generally, could not be determined from the accessible data.

Another animal which carried a large quantity of arsenic in the bones was a colt (Post-mortem No. 27, July 3, 1906) about a year old, which was pasturing about 2 miles south of the smelter. This colt was unthrifty, thin and anæmic, the hæmoglobin being only 50 per cent. by the Tallqvist scale.

There were 4 or 5 ounces of straw-colored liquid in the peritoneal cavity, 2 ounces in the pericardium, and about 2 ounces escaped when the dura mater was punctured. There were 15 or 20 small hæmorrhages under the capsule of the spleen and slight blood discolorations beneath the endocardium. The capsule of the liver was thickened, making the organ appear almost white when first exposed, and the connective tissue throughout the organ was more prominent than in normal animals. There was a chronic catarrhal condition of the stomach and small intestines.

The chemical analysis of the liver gave 3.3 parts of arsenic trioxid per million, while that of the bone gave 13.2, or four times as much.

It is not possible to say what proportion of the animals on which autopsies were made had bones which carried such an astonishing quantity of the poison, for the reason that few analyses of the bones were made. As a rule the bones are not examined in cases of arsenical poisoning, and it appears that when tested the analysts have generally been satisfied to discover the presence of arsenic without determining the quantity. Probably for this reason the writer has not been able, in the literature available to him, to find a statement of the quantities of this poison which have been, heretofore, obtained from these organs.

Brouardel (1) gives the following interesting summary of the conclusions of Pouchet from investigations made in 1879:

“ Whether the poison was introduced by ingestion, by hypodermic injection or intravenously, the arsenic accumulated to a notable extent in the spongy tissue of the bones and was fixed there in such a manner that its presence might be revealed in

the bones of the cranium and the vertebrae, especially, some time after all trace had disappeared from the viscera in which it was localized in the greatest quantity, such as the liver.

" This localization in the spongy tissues of the bones was particularly clear and intense when the arsenic was absorbed in small doses continued for a long time. \* \* \* Thus localized, it was eliminated with great slowness, and, with a certain number of animals, it was clearly revealed by the Marsh apparatus up to eight or ten weeks after the cessation of the intake of arsenic, the dogs and rabbits under experiment being placed in the best possible conditions, for the prompt and complete elimination of the poison."

*Arsenic Trioxid in the Hair.*—The condition of the hair received considerable attention in this investigation, and the results of the few analyses were fully as interesting as were those of the bones. Some of the experts for the farmers reported cases in which the hair had fallen, leaving the skin bare. The writer, however, did not observe any clear cases of this phenomenon. On the contrary, however, the hair was often long, dry and lacking in lustre. In many cases there were patches of very long hair on the withers, croup, sides and upper portions of the limbs. This was generally spoken of as unshed hair, that is, hair which had been retained at the time the old hair on other parts of the body had fallen, and had continued to grow. As is well known, such patches of unshed hair are often seen late in spring on horses which have had insufficient feed during the winter, and which are, consequently, in an unthrifty and anæmic condition. It is possible, however, that in some of these cases in the Deer Lodge Valley the patches of long hair were due, not to its having been retained at the period of shedding, but to a stimulated growth as a result of the local action of the arsenic.

Brouardel(2) says arsenic is reputed to have a special action on the hair and nails, and that the horse traders and coachmen of Austria administer it to their horses with the object of giving them a lustrous coat, agreeable to the eye; also, that the arsenic eaters there, while expecting to gain in flesh and to become more

agile, also hope, especially the women, to beautify their hair. He adds that in France arsenic has not produced such happy results, and that there are numerous examples in which an arsenical medication has caused more or less complete alopecia.

Lancereaux, he says, has published an observation which is the inverse of those to which allusion has just been made. He treated a girl of thirteen years who presented a febrile condition, recalling that of continued fever, and it was only after more than a month, when paralysis appeared, that a diagnosis of arsenical poisoning could be made. When Lancereaux saw this girl he noticed that her legs were covered with hair, but at the time did not connect this phenomenon with the intoxication. The following year he had occasion to see the girl again, for an entirely different affection, and, observed on her legs long, thick hair, which masked the skin as the hair of an infant conceals the skin of the head. This hypertrophy of the pilous system, which was only temporary, had for its seat exactly the parts which had been affected with paralysis.

This interesting case, the only one of the kind which has come to the attention of the writer, is referred to as, perhaps, explaining some of the cases in the Deer Lodge Valley of long, patchy hair on colts which were so young as to make it improbable that the long hair was due to its retention at shedding time.

Mann(3), especially, has called attention to the affinity of the keratin tissues, including the hair, for arsenic, and to the relatively large quantities which they may carry. The following extracts from his testimony before the Royal Arsenical Commission is of much interest in this connection:

“ I next took some of the horny scales that you find on the feet in keratosis, which is very common \* \* \* in chronic arsenical poisoning. I must confess that I was astounded with the amount of arsenic which was present in the horny scales, and, also, in the other skin appendages, the hair and particularly the nails. \* \* \* For instance, I got ample evidence of the presence of arsenic from 0.2 gram of the horny scales, and from

0.1 gram, and even from 0.03 gram. \* \* \* I obtained well-marked crystals without any difficulty whatever. \* \* \*

" In amounts of hair varying from a gram to half a gram, and even in 0.2 gram, I found arsenic. \* \* \* I was particularly struck with the affinity of these keratin tissues, the horny layer of the epithelium, the hair and the nails, for arsenic, and the large amount that they would take up."

These very interesting observations, which apparently did not include any accurate, quantitative determinations of the arsenic, led the writer to suggest to Swain and Harkins that a number of quantitative analyses be made of the long hair of some of the Deer Lodge Valley horses. In this they readily acquiesced, and, although the remarks of Mann had led to the expectation that considerable arsenic might be found, the quantity actually recovered went far beyond any anticipations which the writer had previously entertained. The following table shows the results:

*Table Showing Quantity of Arsenic ( $As_2O_3$ ) Found in Hair from Horses in Deer Lodge Valley. (4)*

| Animal. | Sample.        | When<br>Obtained. | Distance<br>from<br>Smelter. | Parts<br>Per<br>Million. |
|---------|----------------|-------------------|------------------------------|--------------------------|
| Filly   | Hair from body | June 28, 1906     | 5.0 miles                    | 460                      |
| Filly   | Hair from body | July 3, 1906      | 2.0 miles                    | 605                      |
| Horse   | Hair from tail | Nov. 4, 1906      | 1.5 miles                    | 58                       |

The samples from which the first two analyses of the table were made, were of the long hair growing in patches over the surface of the body. The enormous quantity of arsenic in the hair as compared with other organs is shown by the fact that, whereas the hair of the second animal contained 605 parts per million, the liver of the same animal contained but 4.4 parts and the bone 13.2 parts. In the case of the third animal, the hair of

the tail was taken for analysis, and while it contained a large proportion of arsenic as compared with the internal organs, it appears small when compared with the two samples of long hair from the body. This would lead to the suspicion that this hair was long precisely because a large quantity of arsenic had been deposited in it, having had, in its passage to the hair, a special local action on the papillæ, which caused the more rapid growth of the hair, or its retention, as the case may be. The horse, which had 58 parts per million in the hair of the tail, had 6 in the liver, 2.2 in the bones and 1.4 in the kidney. These findings certainly show the importance of a quantitative analysis of the hair in chronic arsenical poisoning.

Harkins and Swain say, referring to these analyses: "The case is more complicated than those investigated in England, since an unknown fraction of the arsenic in the hair was undoubtedly deposited from the atmosphere." This is true; and, unfortunately, it is impossible to determine how large a fraction of the total quantity was deposited directly from the atmosphere and how large a remainder passed through the digestive organs and was carried by the blood to the papillæ of the hair. It is probable, however, that by far the greater quantity reached the hair by way of the blood, and this is confirmed by the much smaller quantity found in the hair from the tail.

*The Retention and Accumulation of Arsenic.*—The discovery of such large quantities of arsenic in the bones and muscles of animals, as well as in the hair, raises the question of the accumulation of this poison when it is taken into the body daily for a considerable time. Does the arsenic tend to increase in quantity in the body, under such circumstances, until it finally reaches a point where it greatly exceeds the dose ingested daily, and then produces serious or fatal effects, or is an equilibrium established between the intake and the excretion, so that a dose which is at first free from injurious effects continues to be non-injurious for all time? This is an important question, not only as it relates to cases of chronic intoxication such as occurred in the Deer Lodge Valley, but also as it relates to the continued administra-

tion of small doses of arsenic in medical and veterinary practice. Until recently, this question has not received the attention which it merits; and, in general, arsenic has not been looked upon as a cumulative poison, or at most the accumulation has been regarded as insignificant, a few days' intermission or a temporary diminution of the dose being thought sufficient to permit the excretion of all the poison and to make a continuation of the medication safe.

The evidence submitted to the Royal Arsenical Commission directed attention particularly to this question, and, taken with the observations of others in recent years, furnishes a basis for a much clearer idea of the extent and importance of the accumulation of this substance than was formerly entertained. The fact that these observations are not generally accessible, and that they have a direct bearing on the cases under consideration, is sufficient reason for introducing them here with some detail.

Peterson and Haines say (5): " Peculiar features are found in chronic poisoning that have given rise to the theory that arsenic is cumulative. Careful investigation shows that the poison is not stored up in the tissues for such a length of time as are lead and mercury, though the effects appear to accumulate in force and gravity.

" Arsenic is readily diffusible and, passing to the tissues, abides for a few weeks and then is eliminated. The dose may be considerable, yet if the patient lives for three weeks, the arsenic may have entirely disappeared from the soft tissues, but, as Brouardel and Pouchet found, it may still be detected in the bones. On the other hand, cases are recorded where the poison has been found in the liver and bones after two and even six months."

They further say (6): " Hills analyzed the urine for arsenic in 180 cases. \* \* \* In some cases as many as 80 days elapsed before the arsenic disappeared from the urine."

In another reference to the same subject they state: " Arsenic has been detected in the urine ninety-three days after a single

large dose had been administered, causing acute symptoms and having a sequel of paralysis."

These are cases in which arsenic was retained in the body during a long period of time after a single large dose. The question in which we are most interested is, What occurs when smaller doses are administered daily for weeks or months? The evidence submitted to the Royal Arsenical Commission probably comes the nearest to answering this question of any which is at present available.

In this connection, Mann made the following statement (7): "In England, chronic arsenical poisoning, as in the present outbreak, is quite a new matter. A great distinction must be drawn between cases of acute arsenical poisoning which were previously known in this country and these cases of chronic arsenical poisoning; for example, in the acute arsenical poisoning you will not find arsenic in the urine longer than ten, twelve or fourteen days at the outside. I have never found it in acute cases longer than five or six days. It seems to me that the constant taking of small doses causes the arsenic to back up, if I may use the expression, in the tissues. I do not think that it combines in the sense that the other metals do, but more is received than can be eliminated. A certain amount is stored up and it takes time to come away. The general tendency is for the arsenic to get away, judging from the cases I have followed so far, in six or more months, probably, but something like that ("months" is possibly a misprint for "weeks," as the witness states elsewhere that the longest period in which he had found it was 59 days after the patient had ceased drinking beer.—D. E. S.). \* \* \* I should like to point out to the Commission that there is a very thick line to be drawn between acute arsenical poisoning and chronic arsenical poisoning, so far as elimination goes. We have always regarded arsenic as a non-cumulative poison up to now. Cumulative is a relative term, but arsenic lingers in the system much longer than we thought."

The same witness stated (8): "Arsenic was found in the urine 21 days, in another case 32 days, and the longest period

in which I found it was 59 days after the patient had ceased drinking beer."

Kelynack said (9): "It is generally believed that arsenic is excreted rapidly, but our recent experience has conclusively shown that arsenic may act as a cumulative poison."

Luff said (10): "Another lesson probably taught by the epidemic is that the views hitherto held as to arsenic being a non-cumulative poison will probably have to be modified. Some of the symptoms point to the fact that the arsenic must have accumulated, and have been retained in the system for a considerable period of time."

Delepine said (11): "What I have found is that when a very small amount of arsenic is administered daily there seems to be an accumulation. There is an accumulation, because one finds several days after the arsenic has been stopped that there may be in the body a larger amount of arsenic than the daily dose given."

The same witness said with reference to his experiments on rats (12): "Arsenic was found in the tissues of two rats which had ceased to take arsenic for more than 40 days before death. In experiment 1, the amount found was nearly equal to a daily dose. In experiment 6, the amount of arsenic found was 16 times greater than a daily dose. The daily dose in this case was exceedingly small."

Since the older evidence cited shows that arsenic may remain in the tissues a long time after a single large dose is given, and this more recent evidence shows that it may remain and accumulate when daily small doses are taken, we cannot avoid the conclusion that arsenic in either large or small doses may be retained in the tissues. If the doses, either great or small, are repeated daily, it may accumulate so that there will be more in the body at one time than the daily dose given. This being the case, we should not be surprised to find that in a certain number of cases, when arsenic is taken daily, the effect is greater than would be expected from the size of the daily dose. It is a poison, therefore, which cannot be repeated with the same impunity as drugs

which spend their force and are entirely eliminated within a few hours.

In considering the effect of the slow elimination of arsenic as increasing the probability of harmful action when animals ingest moderate doses daily for a long time, it must not be forgotten that in addition to the retention which may occur with the eliminating organs in a normal condition, there is another form of retention due to pathological conditions of the eliminating organs which diminish their permeability. Thus Peterson and Haines (13) tell us that "Organic diseases of the kidney, by retarding elimination, as a rule decidedly increase the effects of most poisons, a dose that would ordinarily not be over large sometimes produces serious results when the person is suffering from renal disorder."

With the greater part of the animals of the Deer Lodge Valley suffering from marked renal disorders, as shown by the microscopical examinations of the writer, it may be assumed that they were more susceptible and suffered from a smaller dose than would similar animals with normal kidneys. That there must, also, have been a great accumulation of arsenic in the tissues seems clear, not only from the analyses of bones and hair cited in this article, but also from the large quantities revealed in the livers of some of the animals, as shown by the table published in the third article of this series. It will be seen by referring to that article that with four animals in the experiments of Harkins and Swain poisoned with large doses of arsenic, and which died of acute poisoning, the maximum quantity recovered from any liver was 12.2 parts per million. A horse which died of acute poisoning in the experiments of the writer (No. 92), and which had been given repeated large doses, carried in its liver 14.8 parts per million. In the livers of Deer Lodge Valley animals were found as much as 31.7, 33.8, 52.5, and 63.12 parts per million, or from two to four times as much as the maximum of acute cases in the experiments. Now, how are we to explain the much greater quantities of arsenic found in the livers of the Deer Lodge Valley animals, some of which had shown no acute

symptoms and were sacrificed for examination, except on the theory that a great part of it had accumulated by the long-continued ingestion of sublethal doses?

With animals carrying such an accumulation of arsenic in the tissues, and with the eliminating function of the kidneys diminished by chronic nephritis, it is evident that only a moderate increase, or perhaps no increase at all, in the daily dose was required to overload the tissues, overcome their power of resistance and bring on acute symptoms or death.

*(To be concluded in the next issue.)*

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BUREAU MEN DINE.—The Bureau of Animal Industry employees of South Omaha and their ladies assembled in banquet recently and spent a very pleasant evening. Plates were laid for 120 and a fine five-course supper was served. Dr. Thomas White acted as toastmaster and was also the leading spirit of the banquet. The supper was followed by a program and a general social time. At the following regular monthly meeting of the Bureau of Animal Industry employees it was voted to make the banquet a regular annual affair.

THROUGH the courtesy of Secretary Peter F. Bahnsen, we have had the privilege of examining the questions on the various subjects used by the Board of Veterinary Examiners, State of Georgia, at its last examination for license to practice in that state, which, but for want of space, we should publish in the present number. The rules of the Board demand that no paper shall fail to grade 60 or better, and the general average must not be less than 75. The doctor states that four of the applicants that came before the Board were not graduates of recognized colleges, and they all failed to pass. The following graduates successfully passed the State Board: Dr. Otis Perrin, Kansas City Vet. Col., 1911; Dr. Jesse C. Wright, Kansas City Vet. Col., 1911; Dr. J. M. Jehle, C. V. C., 1911; Dr. S. N. Bradshaw, Ala. Pol. Inst. Vet., 1911; Dr. A. P. Edgerly, Ohio State Vet. Col., 1909; Dr. Jean V. Knapp, Col. State Vet. Col., 1911; Dr. Cecil S. Lemon, Col. State Vet. Col., 1911; Dr. W. M. Burson, Cin. Vet. Col., 1907.

## SOME OF THE FEATURES OF SANITARY POLICE WORK AS APPLIED IN THE FEDERAL QUARANTINE SERVICE.\*

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Sanitary police work, as related to veterinary science, is to be regarded as the practical application of prophylaxis in connection with the live stock interests of a given section, or of a nation, and therefore constitutes the chief function or office of a quarantine organization, whether it be Municipal, Local, State, or Federal.

The sanitary police work of the United States Bureau of Animal Industry, having reference to the importation of live stock from foreign countries, is under the direction and supervision of the quarantine division of that Bureau, so likewise is the control of the importation of hides and skins, and some of the other animal products, as well as hay, straw, and feed stuffs, all of which are covered by regulations numbered and known for identification as Bureau of Animal Industry orders in the case of animals, hay, straw, and forage, and Treasury Department, Division of Customs, orders in the case of hides, hide cuttings, and parings, or glue stock.

The foregoing represent the main sources through which the contagion or infection of the diseases of live stock threaten us from abroad, and which long ago might have gained entrance with serious results to our great animal industry were it not for the adequacy of our laws and regulations, and the effectiveness with which they are administered. For when the greatness of our maritime commerce with other countries of the world and the immensity of our agricultural area are considered, together

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with the wealth and progressiveness of Americans in matters pertaining to breeds, breeding, and the development of the animal industry, it would seem impossible otherwise that any of the animal plagues and diseases of the old world could have been excluded. Neither rinderpest, sheep pox, nor swine erysipelas have ever gained an entrance to America, nor indeed did the dreaded foot-and-mouth disease in the outbreaks of either 1902 or 1908, through any of the avenues over which the Bureau of Animal Industry has supervision. We say dreaded foot-and-mouth disease not so much on account of the seriousness of the disease to the animals attacked, but on account of its extreme contagiousness and the disaster and demoralization that would result from an economic viewpoint should it ever gain a footing and become disseminated over America.

#### CONTAGIOUS DISEASES OF ANIMALS IN FOREIGN COUNTRIES.

A number of foreign, particularly European, countries maintain sanitary supervision over their live stock, and issue periodical reports showing the status of contagious diseases of domestic animals. The reports covering last year have been tabulated and the results are shown in a series of tables in the Annual Report of the Bureau for 1910. The problem of controlling foot-and-mouth disease proved, as heretofore, a difficult one in many of the European countries. All of the countries of western, or at least of northwestern Europe, recognize the necessity of adopting very prompt measures of eradication, and these countries were practically free from the disease at the close of the year. Most of them, however, including Great Britain, had to deal with one or more isolated outbreaks, and owing to the prevalence of the disease in central and eastern Europe both Great Britain and Denmark have reported outbreaks during the present year. In England there were outbreaks this year, in March at Chobham, Surrey, and again in July. The prompt destruction of animals and disinfection were effective in the arrest of the disease in the March outbreak, it being confined to the one premises. It was surmised that the infection in this instance was introduced in Russian oats, of which the owner of the farm infected had re-

cently purchased a large quantity, though it was subsequently stated that the Board of Agriculture and Fisheries was absolutely unable to determine the source of the infection. The July outbreak or outbreaks have been the cause of much concern. On July 5 the disease was reported on Bland's farm, Hounslow, County of Middlesex, and two days later on another farm about a quarter of a mile distant. The third outbreak was reported three or four miles farther on, near London. An investigation by the officers of the Board of Agriculture showed that the second and third farms infected was by mediate contagion from the first but another outbreak was reported at Winchelsea, near Rye, in the County of Sussex, on the 17th of July, and on the 19th a number of sheep were found infected, which were pasturing on the marshes on a farm adjoining the Winchelsea farm.

Regarding central and southern Europe, although only Italy and Switzerland were affected during the first part of 1910, the disease later traveled northward with great rapidity and the efforts which were made to prevent its spread proved ineffectual.

#### AUSTRIA-HUNGARY.

The tables for Austria, Hungary, and Germany, in the previously mentioned Annual Report of the Bureau, give a fair illustration of the extreme contagiousness of foot-and-mouth disease, especially those for Austria and Hungary. These two countries were entirely free from the disease during the first six months of 1910, but it gained a foothold in July and afterwards spread so rapidly that both countries were entirely overrun at the close of the year.

Thus the reports for December show that the year ended with a total of 72,389 farms or premises infected in Austria and Hungary. There was not much change in the status of the other diseases in Austria as compared with 1909, except hog cholera, the outbreaks of which were nearly four times as numerous in the last four months of 1910 as they were during the same period in 1909.

Aside from foot-and-mouth disease in Hungary, the outbreaks of most of the other diseases were considerably less than in 1909. This applies especially to erysipelas of swine. Hog cholera, however, as in the case of Austria, was more prevalent. It has occurred to me frequently since my visit of last spring to Dr. Paul Fischer's hog cholera serum plant of the Ohio State Board of Agriculture, that these countries would find it profitable to take up the Dorset process of immunization.

#### BELGIUM AND THE NETHERLANDS.

Also with regard to foot-and-mouth disease in Belgium and the Netherlands, it is of interest to note that during two years, or a little more, prior to November 18, 1906, the United States Department of Agriculture was permitting the importation of cattle from Belgium and Holland. On the date just mentioned a shipment of brown Swiss cattle left Antwerp for New York. These cattle had been taken from Switzerland to Belgium a little more than six months previously, and kept on a farm a short distance from the port of shipment, in order to meet the requirements of the Department's regulations in the matter of eligibility for certification by the Belgian authorities, cattle not being permitted from Switzerland on account of foot-and-mouth disease in that country. Almost simultaneously with the shipment of these Swiss cattle, Belgium imported the infection of foot-and-mouth disease in some French sheep, which disease, before the end of the following month, December, extended to every province in Belgium, and over the border into Holland, with the result that both countries became overrun with the disease, the official reports showing that Belgium reached in that month (December, 1906) 5,878 cases.

The Netherlands seemed to hold the disease in check until July, 1907, there being 104 cases reported in December, 1906: 175 in January, 1907; 186 in February, none in March and April, 195 in May, and 43 in June, 1907. In July they evidently lost control, as there were 47,398 cases reported for that month,

and 137,243 for August. So it has gone on both in Belgium and the Netherlands, seeming to be under control for a period and then breaking out with fresh vigor, with this summer recording an extensive prevalence of the disease. The manner in which foot-and-mouth disease crops out at widely separated localities, after several months' intermission, would seem to show the possibilities with regard to the virus lurking on premises ready to attack several months after it had been considered to be extinct. For instance, there was no foot-and-mouth disease in the Netherlands in May, 1909; there were then two outbreaks in June, none in July, none in August, and one in September. The country was then free to the end of January, 1910, and arrangements were made to permit an importation of Holstein cattle from the Netherlands. In fact, the permit had been issued, when an outbreak of foot-and-mouth disease was reported as having occurred in February, which necessitated the cancelling of the permit, as our regulations require that the section from which ruminants and swine are exported to the United States shall have been free from infectious and contagious diseases during the six months preceding. The February outbreak occurred in the province of South Holland. There was another in March in the province of Overijssel, and still another each in April and May in Guelderland and South Holland respectively. It will be noted that these are each single outbreaks, and that those occurring in the four successive months were at widely separated points. There was no foot-and-mouth disease reported in the Netherlands from then (May, 1910) until February, 1911, for which latter month 44 outbreaks are reported. There was no foot-and-mouth disease reported in Belgium from May, 1909, to August, 1910, with a record of 1,639 cases for April, 1911, and the last official reports received, *i. e.*, June, 1911, showing a total of 68,763 cases on 4,389 premises. Also, in the Netherlands during the same month (June of this year) the disease is reported as existing on 18,214 premises, affecting every province in the country except one, Groningin.

As previously stated neither of the outbreaks of foot-and-mouth disease which made their appearance in the United States in 1902 and 1906 gained an entrance through any of the sources or channels over which the Bureau of Animal Industry has supervision. The disease has appeared in the United States only on five different occasions, viz.: in 1870, 1880, 1884, 1902, and 1908, and fortunately each of these outbreaks has been promptly stamped out. The methods put into practice since the establishment of the Bureau of Animal Industry permit of no compromise in the handling of such maladies, the prompt slaughter and destruction of diseased and exposed animals alike being required, such slaughter and destruction to be immediately succeeded by thorough disinfection: that is, we aim to eradicate every trace of infection from each premises or locality dealt with. Great Britain and a few other European countries now operate along the same lines, though except in the handling of single or isolated outbreaks on the continent the disease has usually been combated by isolation and quarantine, and it would seem from the consular reports received that in those countries in which the disease exists, and is more or less prevalent much of the time, that they simply quarantine the affected and exposed animals, proceed to infect the latter, treat them in accordance with the indications, and hope there will be no further spread of the disease. In the latter part of June the Agricultural Department received through the Department of State a communication from the American consul at Breslau, Germany, regarding the prevalence of foot-and-mouth disease in Silesia and elsewhere in Germany, in which it was stated that practical farmers are applying the lessons of observation and experience to the handling of cattle stricken with the disease. Knowing that its appearance signifies the certain infection of the entire farm, no matter how carefully the different stalls are isolated from each other, they take steps as soon as a case appears to accelerate the spread of the disease so that it may rapidly run its course. This is done by artificial infection through mixing the feed; taking that contaminated by an animal with a mild form of the disease with a view to trans-

mitting the same mild form to the other cattle. This seems to us a rather primitive method of combating contagious disease. Indeed, I think it will not be claiming too much to state that America set the pace in contagious animal disease eradication in its wonderful campaign against pleuro-pneumonia, successfully completed in the spring of 1892, in the thickest of which it was my privilege to have an active part.

The last outbreak of foot-and-mouth disease in America was definitely traced to some calves used to propagate vaccine virus, and the most careful investigations as to the origin of the 1902 outbreak shows it to have had a similar origin. Quite full particulars in this connection may be obtained in Bureau of Animal Industry Circular No. 147, issued June 16, 1909, and entitled, "The Origin of the Recent Outbreak of Foot-and-Mouth Disease in the United States." The first outbreak to occur in America, that of 1870, was introduced by way of Canada, and spread into the New England States and into New York, though the disease at this time appears to have been of a mild type, and the dissemination of the contagion was quite easily arrested. In 1880 there were two or three lots of animals brought to the United States affected with the disease, but there was no extension of the disease from the animals originally affected. In 1884 there was a small outbreak at Portland, Me., from imported animals, which spread to a few herds outside of the quarantine station, but this outbreak was likewise easily controlled because of the small number of animals affected and the limited area covered by the disease. It was in this same year, 1884, under the act of May 29, that the Bureau of Animal Industry was organized, the pleuro-pneumonia campaign inaugurated, and regulations promulgated, with permit, health certificate, and affidavit provisions, which placed importations of live stock under a more complete Governmental sanitary police control.

When the United States came into possession of the Philippine Islands, in the adjustment of affairs with Spain over Cuba, we took up the study of some of the tropical diseases because of the new danger with which we then seemed to be menaced by

returning soldiers, officers, and others desiring to bring animals to the United States from that archipelago. An order was issued by the Secretary of Agriculture, effective December 13, 1901, prohibiting the landing of animals from the Philippine Islands at any of the ports of the United States or its dependencies, as it was soon recognized that most all of the serious communicable diseases of live stock were to be found there in more or less abundance, and owing to the fact of the United States having a climate, somewhere within its vast area, that would seem adapted to the perpetuation of most any kind of an animal disease, should it once gain an entrance and foothold, it was deemed necessary to control or cut off every possible recognized avenue through which the infection of their animal diseases might be introduced, particularly surra and rinderpest. *Surra* could have been properly included in the list of the more serious animal diseases of the Old World, thus far successfully excluded from the live stock of America, and even though the disease did reach our shores in an importation of 51 head of so-called Brahman cattle shipped from Bombay, India, April 27, 1906, it did us no injury because of the manner in which the importation was handled, but on the contrary proved something of a blessing in disguise, as it gave the Bureau actual experience with surra, and served as an additional test of the vigilance and efficiency of our sanitary police service. For the information of members of our association who have not yet seen the Twenty-sixth Annual Report of the Bureau, I would state that this importation was undertaken by Mr. A. P. Borden, executor of the Pierce Estate, Pierce, Texas. It appears that about 31 or 32 years ago, Mr. A. H. Pierce introduced into Southern Texas a number of these so-called Brahman cattle from India, which were successfully crossed on the native cattle, with the result that their progeny were relatively free from ticks, while the native stock in the same pasture would be literally covered with these pests. As a consequence, the Brahman grades thrived under the same conditions, which served to deplete the native stock. The Brahman grades not only withstood the semi-tropical weather conditions

present in the Gulf Coast section, but their sebaceous secretion seemed to be repugnant to insect life, and while the hide of this animal is probably thinner than that of our domestic bovine, it is very tough, as shown by the difficulty experienced in attempting to puncture it with a small trocar and canula or the hypodermic needle. The hair also is very short, another possible reason for these animals not carrying ticks. Through Mr. Borden's representations as to the suitability of these cattle for the Gulf Coast section, and the importance of procuring stock which, when only one-eighth Brahman, possessed the above-named advantages over their native cattle improved through mixing with pure-bred stock principally by the use of Hereford and Shorthorn bulls, the Secretary of Agriculture consented to permit him to make an importation under precautions, which it was supposed were adequate to protect us against the introduction of any of the diseases of live stock in that country. Dr. William Thompson, a veterinary inspector of the Bureau of Animal Industry, who had served two years in the veterinary service of the Phillipine Islands, was detailed to go to India to inspect the cattle before purchase, inquire into their history, supervise their transfer to the seaboard, and accompany them to the United States. He was directed to exercise the utmost care in making inspections, and to accept no animals from an infected locality, and in the event any infectious disease should be discovered among the animals prior to shipment it was stipulated that the entire number should be considered as exposed, and rejected. On the 31st of March, 1906, Dr. Thompson and Mr. Borden met at Bombay, and proceeded first to Miraji, where 22 very fine bulls of the Kreshna Valley breed were purchased. Six bulls of the Nellore breed were secured from Madras. Other purchases were made at other points in sections reported to be free from rinderpest, surra, contagious pleuro-pneumonia, foot-and-mouth disease, and all other contagious diseases, until there were secured in all 46 bulls, 2 cows, 1 heifer and 2 calves, representing seven different breeds, which were shipped to and accumulated at the agricultural farm at Poona, whence they were transported in cleaned and disinfec-

ted cars to Bombay for their ocean voyage. At Poona microscopic examinations of their blood were made on two different occasions, and as a precautionary measure they were inoculated with anti-rinderpest serum to guard against any possible exposure during loading or detention at Bombay. Blood tests were likewise to have been made, by rabbit inoculations, but unfortunately it was impossible to obtain the rabbits for this purpose at Bombay.

*(To be concluded in the next issue.)*

EXPERIMENTS IN ARMY HORSE BREEDING.—The public generally knows that the Government has outlined a plan to encourage the breeding of horses for the army whereby owners in suitable sections will have the command of service to first-class stallions free, in return for which they agree to give the United States options on resulting foals at a fair price. The plan was taken up as a means to provide a good supply of horses such as the army needs, which, strange as it may seem, is rapidly becoming more and more limited. An appropriation was suggested at the last session of the Sixty-first Congress, but no action was taken, one objection being that the plan was not practical—that farmers would not enter into such agreements with the Government.

Fortunately, funds were available to make an experiment to determine this point. Mr. August Belmont, of New York, presented to the Government two of his best known stallions, Henry of Navarre and Octagon, and the Department of Agriculture placed them at the command of farmers in the vicinity of Front Royal, Virginia, on exactly the terms outlined in the Government plan.

By the approval of the War Department, the price to be paid for the resulting foals at three years of age was \$150, and no difficulty whatever was experienced in getting farmers to breed their mares under these terms. About fifty mares were bred, the stallions reaching Virginia somewhat late in the season and Octagon's usefulness being curtailed by a severe attack of distemper.

The interest of the Virginia farmers is keen, and already fifty additional mares have been offered for the season of 1912, and the services of more stallions could easily be utilized if available.  
—*Rider and Driver.*

## ANTHRAX AND TICK FEVER.\*

By W. H. DALRYMPLE, BATON ROUGE, LA.

(Of Committee on Veterinary Sanitary Police Measures.)

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ANTHRAX.—The work of this committee being devoted to Veterinary Sanitary Police Measures, it will not be necessary to take up time in the discussion, in a general way, of either of the topics assigned me, but rather the epizootiological side, more particularly with regard to prevention, and including, of course, sanitation.

Besides, it would seem rather tautological, if you will permit the expression, to make a general report on anthrax, seeing that the subject has been dealt with by this association from time to time, and the papers duly published in the official reports of the proceedings.

And further, there are not only some excellent text-book articles on this disease, but also those from other authentic sources, such as our national Bureau of Animal Industry, some of the state experiment stations, the various professional journals, etc.

In other words, I desire to convey the impression that you are all more or less familiar with anthrax; and it would be more or less a waste of time to try to tell you something you already know.

Hence, I have kept out of this paper a good deal of "filling," and have taken up the sanitary side of the subject almost from the start. This will not only tend to conserve your patience, but at the same time lead to greater brevity.

It may be necessary, however, to mention a few things concerning the bacillus of Duvaline, or the *Bacterium anthracis*, as

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it is the sole cause of our trouble. If this tenacious organism would only perish with its victim under ordinary unsanitary conditions, what a world of anxiety it would save to the veterinary sanitarian whose lot may be cast in those sections of the country where permanent infection exists.

Suffice it to say, then, that Duvaine, in 1863, recognized to be the specific cause of anthrax, or charbon, the "little sticks" which Pollender, of Wipperfurth, stated previously he had found in the blood of cattle affected with anthrax.

It was the late Dr. Koch, however, who gave us more light regarding the development of the spores, and their transformation into rods.

The germ is generally classed as an aerobic, rod-shaped, non-motile, spore-bearing organism; and in one or other of its stages may exist intracorporeally, or, under favorable conditions, outside of the body.

I am rather inclined to doubt, however, the absolute accuracy of the statement made by some of the earlier investigators, that spores have been brought, from deeply buried anthrax carcasses, by earthworms to the surface of the ground. In the first place, the anaerobic conditions surrounding the infection in the deeply buried carcass would tend to hasten the degeneration and death of the aerobic organisms before it was likely for earthworms to come in contact with them, and afterwards raise them from the lower depths to be ultimately spread upon the surface in their castings. And, further, although the depth to which this annelidian representative descends varies according to conditions of temperature and moisture, in the summer it is found near the surface and in winter just below the frost-line, and varying in depth according to the depth of that line.

Hence, I would rather give credence to the opinion that the infection on the surface, which has been credited to the upward freight-carrying ability of the earthworm, had never been buried at all, but had been left there through the medium of infected discharges, either rectal, nasal, or other, and overlooked in the final obsequies.

On the contrary, I am of the opinion that if all the natural orifices of the cadaver are effectually closed with tampons of tow, or lint-cotton, saturated with some effective germicidal fluid to prevent the escape, and destroy the infectivity, of any possible discharge, and the carcass interred, with or without lime, the chances for infection being left at that point will be extremely small.

In short, if the *whole* carcass, including its infected tissues, discharges, etc., is carefully buried, the risk of future infection from that source will be reduced to the minimum, and without much fear of its being brought to the surface from the bowels of the earth in the bowels of the earthworm.

The size of the rod is usually given at from 5 to 8 microns long, by about 1 to 2 microns broad, with square-cut ends.

In bouillon cultures the rods grow into long, flexible filaments, made up of separate segments which are readily distinguishable in the stained specimen.

The organism grows freely on a variety of culture media at a suitable temperature, say from 20° to 38° C. It is said to cease to grow below 12° C. and above 45° C.

The rods are said to survive a temperature of 45° C., but are destroyed in ten minutes at 100° C.

The spores are much more resistant than the rods, and are said to have survived 130° C. And when old and dry, may require several hours at 140° C. to sterilize them.

The short description I have here given of this organism may be more or less classical—when taken from the blood soon after death.

The problem of identification becomes more difficult, however, with the age of the material to be examined, due to contamination with septic forms, some of which have a certain resemblance to the anthrax bacillus, and also on account of degenerative changes in the germ itself.

Then, again, some methods of staining are not so satisfactory as others, on account of their shrivelling action on the protoplasm.

It would seem that the methylene-blue method, first described by Sir John McFadyean, I believe, has the greatest diagnostic value—staining the undistorted rod-protoplasm blue, while the capsule assumes a rose-pink hue.

That this organism may, and does, under favorable conditions of heat, moisture and nutritive material, vegetate outside of the animal body, I hardly think there can be any question. For, according to Koch, the bacteria grow readily upon potato, infusions of hay, mashed barley, mashed wheat, and numerous other substances—all the conditions being favorable; and at the Louisiana Experiment Station Dr. Howard J. Milks, a member of this association, and at the time assistant veterinarian and bacteriologist of the station, inoculated with spores such media as alfalfa, Bermuda grass, vetch, clover, stringbean, etc. with resultant growths of anthrax bacteria.

From this it may readily be inferred how difficult a problem it is to deal effectively with anthrax infection especially in the warmer sections of the United States, where, although laws may be altogether adequate, sufficient appropriations are not made by state legislatures in order to properly enforce the sanitary provisions of such laws.

True, conditions have much improved in this respect, and are improving as time goes on. But, unfortunately, for want of adequate state appropriations in the infected commonwealths of the Lower Mississippi Valley to enforce the necessary sanitary regulations, with regard to proper disposition of carcasses especially, and required by law at that, infection is being added to year by year.

The channels of infection in the animal are chiefly by ingestion and external inoculation, although it is possible the respiratory tract may occasionally be added, in the event of dried forage being contaminated with spores and the latter inhaled, much as in the case of the wool sorter or the mattress maker, with dried spores from wool or horse-hair.

My own experience seems to have been that the initial case, or cases, was usually some animal grazing over pasture pre-

viously infected through the blood and tissues of an anthrax carcass left carelessly exposed. Then, the outbreak continued through the medium of innumerable myriads of tabanids, or horseflies, which had been feeding upon the infected blood and, with soiled probosces, inoculating other animals externally—in my section of the country, at least.

But while these tabanids (and I expect we may include some other flies and mosquitoes) are, in my judgment, responsible for widely spreading the infection, when once they obtain it from an animal in the last stages of the disease, or even shortly afterwards, so long as the blood remains warm and fluid enough to be imbibed by them, there are numerous other media of transmission.

At the annual meeting of the United States Live Stock Sanitary Association, held in Chicago two years ago, there was a resolution adopted, if I mistake not, recommending the repeal of all state laws protecting the turkey buzzard and carrion crow, which frequently scavenge together. Some states in the South have, I think, already done so; and I am firmly of the opinion that, in order to circumscribe the infection of anthrax, in some of our Gulf States at least, these birds will either have to go, or their tastes educated to more delicate morsels than the tissues of the anthrax cadaver.

On the presumption that any agent which comes in contact with anthrax-infected blood, and can mechanically carry it on the exposed parts of the body, is capable of transporting anthrax infection and creating fresh foci of the disease, the buzzard has naturally been looked upon as one of the guiltiest of these agents; and to make a test of the matter and, if possible, authenticate the presumption, some experiments have, during the present year, been conducted and are being conducted by Dr. Harry Norris, assistant veterinarian and bacteriologist of the Louisiana station, a brief summary of which is as follows:

On March 1, anthrax spores from four agar-slopes were fed to a buzzard in captivity. Twenty dilution plates were prepared from cultures made from the excreta, but no anthrax was found.

On the 7th, 8th and 9th, spores were fed to a buzzard, the excreta collected, and thirty plates prepared, but with negative results.

On the 20th, a rabbit which had died of anthrax was fed to a buzzard. On the 21st, twenty plates were made from the excreta: on the 22d, twenty more plates were prepared, but with negative results.

On the 30th, a rabbit dead of anthrax was fed. An hour and a half later the feet and bill of the buzzard were scraped, and cultures made from the scrapings. Vomited material which the buzzard had emitted was also cultured and all showed anthrax organisms.

On April 1, a rabbit was fed to the buzzard at 11 a. m.

Forty-eight hours later, cultures were prepared from the feet and bill and all showed anthrax.

On the 8th, another rabbit was fed, and anthrax infection was found on the feet and bill thirty-two hours afterwards.

On May 23, a rabbit was fed to the buzzard, and twenty hours later the bird was killed. Cultures were made from the mouth to the rectum, with the result that anthrax was found in the crop and in the gizzard.

On June 4, a similar experiment was conducted. The buzzard was destroyed nineteen hours later, but with negative results.

On July 11 a buzzard was fed spores inoculated into meat. The bird was killed nineteen hours later, but with negative results.

On the 17th, the previous experiment was repeated with similar results.

Incidentally it might be here mentioned, that both common houseflies and ants that had been feeding upon the anthrax carcasses of the rabbits used in the experiments were carefully caught on agar-plates, resulting in profuse cultures of anthrax organisms.

The chief deductions to be made from these few practical experiments, which were, I think, as close to natural conditions as possible, are:

(1) That, in these experiments at least, no anthrax infection was found in the excreta of a buzzard fed animals dead of the disease.

(2) That buzzards, after feeding upon anthrax flesh, have their bills and feet contaminated with anthrax infection, which they may carry considerable distances and create fresh foci of the disease.

(3) That, after feeding upon anthrax flesh, the vomitus from the buzzard, which is frequently emitted after a full meal, may be infected, and may also produce fresh centres of the disease.

(4) That the housefly and the ant, and probably other forms of insect life, after feeding upon or otherwise coming in contact with anthrax flesh, may become extremely dangerous as carriers of the infection.

Other agencies through which infection may be carried are, of course, dogs, hogs, etc., which have had the opportunity to feed upon anthrax flesh.

Streams, also, into which the virulent blood may have been washed, or contaminated directly through carcasses being thrown into them.

Occasionally, I fear, spores may be introduced and spread through fertilizers composed of animal tissues not sufficiently exposed to heat to thoroughly sterilize them. I recollect a fertilizer of this kind coming to the chemical laboratory of our experiment station to be analyzed in accordance with our state law. This material was labeled a "foreign tankage," and was found to contain nothing but leather (not a very available form of nitrogen for plant food), wool, and shoddy. It was not tested bacteriologically, and I do not know that it was infected. The chances are, however, that this so-called fertilizer came from one or other of the countries to the south of us, where anthrax frequently exists, but not much sanitation.

I merely cite the above as an instance where animal tissues, in the form of fertilizer, might sometimes be the means of introducing and spreading anthrax infection over a wide area without even being suspected. The sale of this particular shipment of "foreign tankage," so-called, was prohibited on our local market.

Then, foodstuffs doubtless do occasionally harbor and convey spores of anthrax. I have had at least two instances in my own experience, and there are others recorded. In my own cases, which occurred a number of years ago, although not verified by bacteriological examination of the foodstuffs, the circumstantial evidence was so pointed in each case as to dispel any doubt in the matter.

There are, doubtless, other media of transmission which could be mentioned, but I shall allude to just one more, viz.—hides.

Carcasses are often skinned for their hides by the unwary during extensive outbreaks of anthrax. Of course, the gravity of the undertaking is not realized by those who do it, and the result often is carbuncular anthrax in human beings, with, frequently, death following. I have known of this procedure in my own state, and have witnessed some of the unfortunate human victims.

Such hides as referred to are usually shipped somewhere to market, and sometimes conveyed to the shipping point on the wagons of public carriers or transfer companies. The consignees may be either intra- or inter-state; and if the latter, it brings up the point of the interstate shipment of infection-carrying articles of commerce, which, I believe, ought to come within the purview of our authorities at the National Capital.

Brought down to its ultimate analysis, the most militant factor against the successful work of the veterinary sanitarian in dealing with anthrax infection is *the infected carcass*.

Artificial methods of prevention are good, and necessary, and highly to be commended. But when the victim succumbs to the disease, all interest in it is lost, so far as the owner is concerned.

State sanitary legislation may be adequate, as is the case in some of our worst-infected commonwealths, but the gravity of the situation and the necessity for adequate appropriations do not appeal to the average state legislator, who generally knows little and probably cares less concerning matters of this kind, with the result that strict sanitary measures, especially with reference to the careful disposal of the charbonous cadaver, cannot be enforced because of the lack of sufficient money to effectively carry out the provisions of the law on the subject.

This is certainly an anomalous condition of affairs, and applies, I expect, in more states than one, if all the facts were known.

It takes *money* to deal, even reasonably effectively, with anthrax infection. And, where that infection is so widespread, as it is in some parts of the Lower Mississippi Valley, it is, I am afraid, going to take a larger sum of money than at present appears in store, from local or state sources at least, to make any appreciable effect upon the present unsavory situation.

A great deal of good has been accomplished by the use of protective inoculation in the past; but this is mainly voluntary, with us at least, on the part of the owner, making the work erratic rather than regular, which militates against a larger success.

If vaccination, where required, was made compulsory, as it should be, and in the hands of state live-stock sanitary authorities or competent veterinary practitioners, the number of cases would, undoubtedly, be very much reduced from year to year.

It is probable, also, that the use of anti-anthrax serum to protect, temporarily, animals during a present outbreak, may accomplish similar results. But these, although extremely valuable, are merely adjuncts in the general sanitary scheme for the prevention, control and eradication of anthrax infection. Some stock owners will vaccinate regularly; others only when an outbreak of the disease on their own or a contiguous place frightens them into it. And yet, neither of them may realize the importance of seeing to it that a carcass, seething with organismal

life for future infection, is carefully disposed of and placed beyond the reach of the various agencies that are capable of transporting infection from it.

It is largely due to ignorance, or indifference, or both, on the part of the people themselves in not asking, and the state legislatures in not granting, the necessary wherewithal for general state live-stock sanitation, that so much difficulty is experienced in dealing adequately with the anthrax carcass.

I dislike to appear to play the role of the pessimist, as I must admit to having witnessed some slight improvement, from a professional point of view, in my part of the country. Yet, after an experience of quite a number of years in a section where anthrax infection does exist to some extent, I am almost forced to the conclusion, notwithstanding the excellent provisions of some of our state live-stock sanitary laws, that the proper sanitary control of this disease, as it stands to-day, is more than is likely to be accomplished in the near future, if dependent upon the inadequate appropriations made, or likely soon to be made, by at least some of the infected states. And, on account of its bearing upon interstate traffic in disease-carrying articles of commerce, it is a question in my mind whether it is not a matter to be dealt with by, or at least receive the assistance of, the Federal authorities, in order to attempt to place a check on the ravages and loss occasioned almost annually by this fatal, infectious malady.

*(To be concluded in the next issue.)*

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VETERINARY PRACTICE NOT ON DECLINE IN BROOKLYN.—Dr. W. J. McKinney, Brooklyn, N. Y., has purchased the lot at the rear of his hospital, which will enable him to add thirty more stalls to his establishment, a fact which indicates that veterinary practice is not on the decline in the "city of churches."

BROTHER PRACTITIONERS WELCOME.—Dr. Chas. H. Beere, of Waterbury, Conn., writes, "I have lately installed at my hospital in this city a 'Chicago Veterinary Operating Table,' which I find entirely satisfactory, and offer its use at any time to the other members of the profession."

## THE IMPORTANCE OF HOG CHOLERA AND THE PRODUCTION OF HOG CHOLERA SERUM.\*

BY F. A. BOLSER, V.S., NEW CASTLE, IND.

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The importance of "Hog Cholera" and the production of hog cholera serum to the live stock interests of the world will be readily seen when one considers that according to the year book of the United States Department of Agriculture for 1910. there were millions of dollars lost from the greatest enemy to swine. There has always been doubt as to whether the highly infectious disease, hog cholera, existed in different states or whether the reported outbreaks of cholera were not caused by some dietary condition as, for instance, Moore has pointed out in the case of feeding swill which contained large quantities of powdered soap.

However, after the discovery that a filterable virus is the cause of the epizootic disease and not the bacillus of hog cholera, it was suggested that some of the outbreaks of apparently infectious diseases of swine from which this latter organism could not be isolated might be due to the filterable virus. With this in view, historically, it is interesting to note that hog cholera has existed in this country for a long time. It was first reported in Ohio in 1833 and was thought by American authorities to have been imported from Europe. Scientists on that continent, however, denied its existence in Europe until long after its existence here. The absence of positive diagnosis at that time failed to make clear in which country it originated. It is reasonably certain, however, that Ohio was the first state to be infected. During the next twenty years after its first appearance there were over ninety outbreaks divided among several states

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and furnishing centers from which the infection has been carried to practically every state in the Union.

Dr. Geo. Sutton, of Aurora, Ind., made the first report upon the disease in 1853. This was followed by reports by E. M. Snow, of Providence, R. I., in 1861, Dr. James Law, Ithaca, N. Y., in 1875, and Dr. Detmers in 1877. Dr. Law's report contains the first accurate and complete description of the disease. The work of these men covered the symptoms of the disease and the post-mortem appearance of the organs of the animals that had died of it, in fact, all that could be learned from field observation alone.

In 1878, Congress made an appropriation for the investigation of swine diseases. Nine men were appointed for the investigation of 1878, and these for a period of two months only. Consequently little was accomplished. The researches of these men were made in the field and various measures applicable to the control of epizootic diseases were tried. The results of these investigations were summed up as follows in a publication of the Bureau of Animal Industry, 1889, Hog Cholera:

1. Swine diseases were found destructive in the most widely separated districts of the country.
2. The symptoms and post-mortem lesions were similar to those described by Sutton, Snow, Law and others.
3. No evidence was discovered to show that there was more than one disease which prevailed as an epizootic.
4. It was believed that the outbreaks were due to a contagion and that the disease was communicable.
5. The remedies tested were either without effect or of doubtful value in the treatment of affected animals or guarding against the contagion.

Of the nine investigators only Law and Detmers retained their appointment more than two months. These men did considerable laboratory work. Law made inoculations into rabbits, rats and sheep and seemed to establish the communicability of the disease he investigated. Detmers, by the aid of the microscope, thought that he discovered the cause of the disease and named

the organism *Bacillus suis*. Both of these conclusions were in error but pointed out the need of bacteriological research and careful laboratory work as the only means of determining the cause and prevention of the disease. Law and Detmers continued their investigation for the Department of Agriculture in 1879. In 1880 Salmon was added. Law devoted much of his time to the production of a vaccine by attenuation of the virus or cause of the disease. In this he was unsuccessful. During this time Detmers continued his investigation with the microscope. During the next four years little was done in investigation because it was understood that it had been carried about as far as possible under the methods then employed and because of a lack of facilities for and clear methods of bacteriological research.

In 1885 it was announced that Salmon and Smith had discovered the cause of the disease. This was determined as due to a motile rod, to which the name has been given *Bacillus cholerae suis* or hog cholera bacillus. These investigators showed that this organism was found in the organs of most of the animals which they examined that died of cholera. Further, they could produce symptoms similar to hog cholera and lesions, in many cases, indistinguishable from those of animals that had contracted the disease naturally. They were also able to recover the bacillus from the animals which had died as the result of the inoculation.

In 1886, Smith described an entirely different infectious disease of swine due to an organism belonging to the present Septicaemia Haemorrhagica group. Accordingly, it was considered that there were two distinct infectious diseases; hog cholera in which the lesions were largely in the digestive tract, and swine plague in which the lungs were mostly involved. In many outbreaks they were able to find both diseases present and to recover both organisms from the same animal.

The results of Salmon and Smith were confirmed by scientists of this and other countries and it was generally conceded

that there were two contagious diseases of swine, namely hog cholera and swine plague.

Since *Bacillus cholerae suis* was announced as being the cause of hog cholera, the work has been largely to find a vaccine or serum which would serve as a preventive of the disease. Various vaccines and sera were tried but none of the preparations gave satisfactory or practical results. It was not until twenty years later that de Schweinitz was led to the suspicion that *Bacillus cholerae suis* was not the cause of the epizootic form of the disease. He noticed that although hog cholera was very contagious and spreads readily to other members of the herd when once it is introduced, yet when an animal was injected with pure cultures of *Bacillus cholerae suis*, in many cases the animal would become sick and die from the effects of the injection, but other animals associating with it would remain well. He also found that it was difficult to produce cholera by subcutaneous injections of cultures of the hog cholera bacillus, while the injection of some of the blood of a sick animal subcutaneously into a sound one would produce the disease. Other reasons were that although made immune to pure cultures of hog cholera bacillus, animals were by no means immune when exposed to animals sick with the cholera.

These facts led to further investigation. In 1903, de Schweinitz and Dorset reported that *Bacillus cholerae suis* was not the specific cause of the epizootic disease, but that the cause was a filterable virus or one so small that it could be passed through the finest porcelain filter. It might be well to add a word relative to the term "filterable virus." There are certain diseases, for instance, rinderpest and food-and-mouth disease, that are highly contagious, and which are due to invisible organisms or viruses present in the blood and fluids of the body. These viruses are so small that they can be passed through the finest porcelain filter and are invisible even with our strongest microscopes.

As a result of the experiments published in 1895, it was determined that the filterable virus is the real cause of the epizootic

disease of the swine; that the hog cholera and swine plague bacteria are, so far as the epizootics are concerned, secondary invaders. The fact, however, must not be lost sight of that *Bacillus cholera suis* and *Bacterium septicæmia hæmorrhagica* are the cause of certain diseases of the swine, and in many outbreaks they exert considerable influence as to the manifestations of the disease.

MEANS BY WHICH THE INFECTION IS SPREAD. Hog cholera may be spread from a single center of infection in many ways. One of the most prevalent is the purchase of a hog from an infected herd and placing it in a sound one. It is also spread to some extent by taking the sows from a sound herd to an infected herd for service. This has occurred once in our experience in which we had a clear history. The infection may also be carried from one farm to another upon the attendant's shoes or upon the wheels of wagons driven through the infected territory. Horses and cattle, though not capable of contracting the disease, may carry the infection from one place to another upon their feet. This also holds good in the case of dogs feeding upon carcasses dead of the disease. Furthermore, it may be carried down a stream of water from pollution higher up. Pigeons are dangerous carriers also.

PERIOD OF INCUBATION.—The period of incubation varies from a few days to two or even three weeks. This depends a great deal upon the method of exposure, virulence of the virus, and resistance of the animals exposed. Young and pampered animals are usually more susceptible and have the more acute form of the disease. A short period of incubation usually means a virulent type of the disease. As in the case of most infections, the virus of hog cholera is more virulent in the earlier part of the outbreak of the disease and may become so weak that the resistant animals may not become affected at all.

SYMPTOMS. The symptoms of hog cholera are not very characteristic. Fever is usually present and in animals that are coming down with the disease, which have not as yet shown any symptoms of sickness, the temperature may be several degrees

above normal. Frequently it is subnormal in the last stages of the disease. Soon after being attacked the animal loses appetite, becomes weak and may have convulsions. In the early part of the attack, the young and very fat animals may succumb without showing any symptoms of the disease. Diarrhoea may be present and usually follows constipation, although constipation sometimes persists through the disease.

The symptoms vary somewhat with the virulence of the outbreak and the resistance of the animal attacked. If the virulence is high and the resistance low the acute form is seen. In this type of the disease, the animal shows fever, dullness, stiffness, soreness, tremors, weakness and loss of appetite. It does not move unless made to do so; in general there is great depression. The eyes are inflamed and the lids gummed with the secretions. Red patches usually appear upon the skin, especially in the region of the ears, lower jaw, abdomen and inside of the legs. Sometimes the redness is diffuse, covering the entire regions mentioned. Before death this may turn to a purplish color. Coughing, rapid breathing, and other symptoms of respiratory derangement may be present but usually these symptoms are not pronounced until shortly before death.

In the chronic type of the disease about the same symptoms are exhibited as in the acute except that the illness may last several weeks or months, during which there is the usual weakness, loss of appetite, inflammation of the eyes, and usually profuse diarrhoea. If these cases recover they are usually of little value to the owner. It will be noticed from the above description that there are no symptoms characteristic of the disease. However, if an animal or two have died and then after an interval of a week or ten days others become affected in a similar manner, there is sufficient grounds for suspecting the presence of hog cholera.

**POST-MORTEM APPEARANCES.**—There may be reddish or purplish spots upon the skin or the entire region mentioned under symptoms may be colored. Petechiae may be present upon the surface of the heart and occasionally upon the pericardium

and lungs. Frequently pneumonia is present but is not so characteristic as the small hemorrhages. In acute cases the spleen is usually enlarged, dark colored, soft, filled with blood, and may show hemorrhages beneath its capsule. In chronic cases this enlargement is not noticed and the color is often lighter than normal.

The lymph glands in the inguinal region are swollen and red or even dark in color in the acute form of the disease. Those in other parts of the body, mesenteric, angles of the jaw, etc., may be affected in a similar manner. These lesions are not often found in the chronic cases. The kidneys in the acute cases are usually the seat of small hemorrhages. To observe the condition of the kidneys it is necessary to remove the capsule. If the kidneys are slit open hemorrhages of a similar nature may be seen on their inner surfaces. The color of the kidneys is usually darker than normal and the hemorrhages may vary in size from a mere point up to the size of a pin head.

Sometimes petechiae are found on the serous side of the stomach and small intestines. The mucosae of these organs may also show hemorrhages. The large intestine, however, is usually the seat of extensive lesions. In the acute form of the disease hemorrhages may be present on both surfaces of this organ. Erosion of the mucous membrane is also common. The mucosa may be blood stained and the contents of the bowel blood stained from the extravasation of blood. In the chronic form of the disease, the so-called "button ulcers" may be found. These ulcers are usually found in the caecum upon or near the ileo-caecal valve and are quite characteristic of the disease. They are circular, hard, yellow in color, with a darker greenish yellow centre, raised distinctly above the healthy mucous membrane. They vary in size from mere points to an inch in diameter and are so numerous in some cases that large portions of the organ are destroyed. If the ulcers are found diagnosis can be made fairly accurate, although there is no other disease in this country in which the petechiae are found in the heart, lungs, kidneys and other organs.

Any or all of the above described lesions may be found in an animal dead of cholera, but only an occasional animal exhibits all the lesions. For instance, it is practically impossible to find the button-like ulcers in the acute form of the disease and but rarely are the hemorrhages seen in the chronic type.

DIAGNOSIS.—Before diagnosing a disease as hog cholera there are a few important factors one should bear in mind. In the first place, is the disease contagious? That is, can it be spread from one animal to another? Then the symptoms and post-mortem lesions should be considered. It is impossible to get a good idea relative to the disease from these observations, but in order to prove conclusively that the disease is hog cholera, it is necessary to produce the disease in a sound animal by inoculating it with some of the filtered blood of a dead or very sick animal.

The disease must be distinguished from sickness due to improper feeding, especially in cases of swill or garbage fed animals, as it has been shown that powdered soaps used in washing dishes may cause a disease which resembles cholera. Of course, disorders due to dietary conditions would not spread as an epizootic, while hog cholera would most likely spread throughout the neighborhood. There are so very few other diseases which might be confused with cholera that time will not be taken to discuss them.

*(To be concluded in the next issue.)*

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FIFTIETH ANNIVERSARY, A. V. M. A.—The first official meeting of the Committee on the Fiftieth Anniversary of the American Veterinary Medical Association was held in New York City on the evening of January 17, with Dr. John F. Winchester, of Lawrence, Mass., presiding, and Dr. W. Horace Hoskins, of Philadelphia, Pa., recording. Other members of the committee present were: Dean Coates, of the Veterinary Department of New York University, and Drs. Ackerman, Berns, Cochran, Ellis, Gill, Hollingworth and Kingston. Outlines of the working plan were drawn, sub-committees appointed and the work of preparation for the greatest national event in the history of veterinary medicine in America begun.

## COMPARISON OF PERIODIC OPHTHALMIA OF EQUINES WITH GLAUCOMA OF MAN.\*

BY L. C. TIFFANY, SPRINGFIELD, ILL.

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This paper is presented with the avowal that the writer is not possessed of profound or superior knowledge of the anatomy, physiology or pathological changes which affect the eye of either equines or man, but is presented for the purpose of stimulating others to the acquirement of such knowledge, and particularly concerning the condition so long termed "periodic ophthalmia" in equines.

Several years ago, when engaged in practice in Jacksonville, Ill., this subject engaged much of my thoughts, as the cases were numerous and the patients often very valuable. It was my good fortune to have the acquaintance of one of the most accomplished ophthalmologists in this country at that time, and now, perhaps, in the world, and with him I frequently conversed upon the subject. He advised me to procure some literature upon the eye and to study the matter thoroughly.

This was obtained, and some time afterward it was evident to me that there was an almost or quite complete analogy between a serious affliction of man and that which destroyed the sight of so many of our patients, although much more common in the latter. I refer to glaucoma, and its symptoms, together with its predisposing causes, appear identical with periodic ophthalmia. There is also a hereditary predisposition in both cases.

Those of us who have observed the eye of the horse critically have noticed that we are able to detect those animals whose eyes are predisposed to the condition under consideration. We notice the wrinkled upper lid, produced, probably, by the hypermetropic

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\* Read at 29th Annual Meeting. I. S. V. M. A., at Chicago, December 8, 1911.

eye underneath. The hypermetropic eye is present and is congenital.

Comparison of the symptoms in both glaucoma and periodic ophthalmia discloses the fact that the attacks are periodical and very sudden; often the first attack is without warning, especially in our patients. As the symptoms in the latter are so well known, it is unimportant to describe them here, and will only say that they seem practically identical with those of glaucoma.

In both we have the hypermetropic eye with increased intra-ocular tension. The one being the important predisposing cause and the other the immediate cause of glaucoma.

The large, deep eye seems exempt from recurrent or periodic ophthalmia, but the small, shallow one is the kind in which we expect to find it sooner or later. In both glaucoma and periodic ophthalmia the period of attack is not usual in early life, but perhaps the latter makes its appearance at a comparatively earlier period than does glaucoma in man. This, however, may possibly be accounted for in the method of feeding equines; for corn-fed animals appear to be more subject than do those who are fed on less fat-producing grains. Again, plethoric animals, or those of that type, are more often affected than are those of the lighter breeds, or non-lymphatic type.

Much of which follows is quoted from the excellent work by Dr. Ernst Fuchs, Professor of Ophthalmology in the University of Vienna:

“ Easy as it is to deduce the symptoms of glaucoma from the elevation of tension, it is quite difficult to account for the origin of the latter and thus explain the essential nature of glaucoma.

“ Of the many theories which have hitherto been propounded upon this subject, no single one is satisfactory in every respect. Only the most important of them will be adduced here, and that mainly with the object of showing upon what circumstances increase in tension in general depends.

“ The intra-ocular pressure is determined by the relation between the internal capacity and the elasticity of the envelopes

of the eyeball, on the one hand, and the amount of its contents on the other.

“ If the latter factor increases or the former factors diminish, the pressure is elevated. An alteration of the internal capacity of the envelopes of the eyeball cannot be brought into account for the increase of pressure, since the volume of the envelopes, as a whole, is unalterable. In advanced life, to be sure, the sclera is not only more rigid, but also a little contracted; but the diminution in volume so caused is extremely slight. We must, therefore, look for the cause of the elevation of tension in an increase in amount of the contents of the eyeball, the envelopes being at the same time not sufficiently elastic to adapt themselves to their increased contents without marked heightening of the pressure. Now the amount of matter contained in the eyeball depends, on the one hand, upon the amount of ocular fluids which are constantly being secreted by the blood-vessels, and, on the other hand, upon the quantity of fluid which leaves the eye through the lymph passages; it corresponds, that is, to the relation between inflow and outflow, between secretion and excretion.

“ In the normal eye this relation always remains about the same; since with any increase of the inflow the liquid, which is now subjected to an increased pressure, also leaves the eye more quickly, so that the normal pressure is soon restored. For any permanent increase of pressure to occur, a disturbance of this self-regulating action must be present. Such a disturbance can be looked for only in the excretory apparatus, for so long as this works normally, every increase in the amount of fluid would soon be compensated for by increase in the outflow. But if the outflow is interfered with, a normal or even a diminished inflow of liquid must lead ultimately to over-distention of the eyeball. Consequently the explanation that is accepted by most authorities at the present time to account for the increase of tension, namely, the theory of Kneis and Weber, presupposes a disturbance of the outflow. The most important path for the outflow lies in the sinus of the anterior chamber and passes through the ligamentum

pectinatum into Schlemm's canal. It is at this spot that the obstacle must be looked for. Such an obstacle is produced in the following way: A genuine glaucoma develops only in an eye which has a *predisposition* to it. This predisposition depends on insufficient spatial relations. These affect the eye as a whole and particularly the region of the anterior and posterior chambers. They are afforded by: (1) smallness of the eye as a whole; (2) shallowness of the anterior chamber; (3) unusual size of the ciliary processes; (4) disproportionate size of the lens.

Such relations appertain to the hypermetropic eye when it has become old. The hypermetropic eye is smaller than the normal eye, its anterior chamber is shallower, and its ciliary processes are unusually large because the ciliary muscle is hypertrophied on account of the constantly maintained accommodation. Yet the lens in such eyes is no smaller than it is in the emmetropic eye. And, as regards the lens, there is the additional fact that it increases in size progressively with advancing age, and yet the eye itself grows no larger, so that ultimately the lens becomes too big for the eye. Hence the hypermetrope does not get glaucoma as long as he is young, but gets it only when with advancing age his lens has become too large, for then the space between the lens and the ciliary processes becomes too narrow. It is through this circumlental space that the lymph flows from the vitreous to aqueous cavity. When this space is contracted the lymph becomes dammed up in the vitreous. The latter consequently increases in volume, pushes the lens and iris forward, and thus makes the anterior chamber still shallower. An actual increase of tension, however, is not yet present in such an eye because the sinus of the chamber is yet present, so that an increased volume of aqueous, such as would correspond to the increased volume of the vitreous, can still be discharged exteriorly. An actual attack of glaucoma does not occur in the predisposed eye until this passage of outflow is blocked. This takes place from closure of the sinus of the chamber and is pro-

duced by some one of the causes which, we know, can excite an attack of glaucoma.

“The exciting causes of this sort, that we know, are disturbances in the circulation of the blood and dilatation of the pupil.

“Let us, to begin with, consider the first case, a stasis of blood in the veins of the greater circulation. In the eye such a stasis makes itself apparently principally in the ciliary processes which are extremely rich in veins. The ciliary processes then swell up and, as the circumlental space is so narrow, soon extend to the margin of the lens.

“In this way the communication between the vitreous cavity and the anterior chamber is still more interfered with, and the vitreous, owing to the retention of lymph, swells up to a still greater extent than before and pushes forward still more strongly upon the swollen ciliary processes. Since the latter are already abutting against the margin of the lens, they can give way toward the front only. They swell forward into the anterior chamber until they reach the root of the iris and jam the latter forward against the cornea-sclera. But in so doing the iris shuts up the passage of outflow for the aqueous, and, hence, the intra-ocular pressure at once necessarily rises. In this way a glaucomatous attack is brought about.

“If the swelling of the ciliary processes soon recedes, or the pupil soon contracts, the iris returns to its former position, the sinus of the chamber becomes free, the tension falls, and the attack, being in this case simply a prodromal one, passes off. If, on the other hand, a return to the normal condition does not take place soon, the root of the iris becomes agglutinated to the corneo-sclera, and out of this agglutination an adhesion afterward develops, a return to the normal conditions has become impossible, and the glaucoma is permanent.

“TREATMENT OF PRIMARY GLAUCOMA.—Glaucoma passed for an incurable disease until Von Graefe discovered the curative action of iridectomy. Afterward still other methods of operating were devised, none of which, however, has been able to displace iridectomy. In this operation the wound should be in the sclera,

not in the cornea; and the excision of the iris should be carried to the ciliary margin and be made as broad as possible. Incarceration of the iris in the wound after the operation should be avoided by careful reposition. If possible, the iridectomy should be made upward, so that the coloboma may be covered by the upper lid, and not cause trouble through the dazzling due to irregular refraction.

As regards the time for performing the operation, it is best to operate as soon as possible.

“MEDICINAL TREATMENT.—The miotics, eserine and pilocarpine, are powerful agents in combating increase in tension. They act only when the iris is capable of contracting satisfactorily; hence, in old cases of glaucoma with a complete atrophic iris they are useless. Their action is accounted for upon the supposition that by contraction of the pupil the iris is stretched in a radial direction, and so is drawn away from the wall of the eyeball to which it has been applied, so that the sinus of the chamber again becomes free. The effects of miotics are only transient and cannot cure glaucoma.

“In the prodromal stage of glaucoma, miotics are employed to cut short the attacks. If a miotic is instilled at the commencement of an attack, it comes to an end quickly, and we can thus, for a long time, prevent the prodromal attack from rising into an acute inflammatory attack. Nevertheless, we should not prolong the prodromal stage in this way until excavation of the optic nerve, with permanent impairment of sight, sets in.”

From a comparison of these strikingly similar conditions the conclusion arose that periodic ophthalmia in equines is glaucoma, and experimental surgical operations were undertaken by the ophthalmologist first referred to in order to demonstrate the correctness of such conclusion. Unfortunately, however, the operator was a very busy man, and soon my time was occupied with another branch of the profession and only two subjects were treated. The first was a four-year-old trotting bred stallion afflicted in both eyes for several months. Before the operation was begun the surgeon insisted that the animal be castrated, and

although the owner was not present, this was done and the operation of iridectomy immediately followed on both eyes.

The owner promised to keep me informed as to the result, which he faithfully performed, and he reported at intervals. This animal did not have a recurrence of the trouble up to the time of his death, from an accident, some nine months later.

The other operation was also on a stallion seven years old, and was not successful. From results in these two cases we should not form definite conclusions, but from the fact that one of them appeared successful, it would seem that we are justified in continuing experiments along this line.

My memory frequently brings to light an account which I read in my days at Toronto, of a physician in Scotland who attempted something about the eye of a horse subject to attacks of periodic ophthalmia and that the cornea was accidentally punctured permitting the aqueous humor to escape and that the trouble did not recur. This, if true, should add some weight to the theory here advanced.

In glaucoma of man the operation of iridectomy gives good results if performed early, and perhaps similar results might follow the operation in the horse. Also, this operation on the predisposed animal with the hypermetropic eye, before he has been the subject of an attack, might be beneficial in a prophylactic way.

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THE VETERINARY CONFERENCE AT THE NEW YORK STATE VETERINARY COLLEGE January 10 and 11 was a great satisfaction to Director Moore, who is always best pleased when he is doing somebody some good, and at the conference he and his colleagues did a lot of people a lot of good. More than two hundred veterinarians from all over the State assembled there. An account of what work was done at the conference will be published in our next issue.

THE ARMY VETERINARY BILL bears House No. 16843; write it on the sweat-band of your hat with pen or indelible pencil, so that you are sure to have it with you when you call on or 'phone your Congressman.

## DYSENTERY IN CALVES.\*

BY H. L. SOMMER, V.M.D., FORT ATKINSON, WIS.

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Dysentery in calves is a subject that has been described numerous times by great authorities, but I shall beg your indulgence if I touch this subject rather roughly, and should I not express myself as technically as I may desire, I crave the pardon of the profession, for my shortcomings will be due to my inexperience rather than the lack of painstaking.

The form of dysentery I will describe is the one which attacks calves one to two days old. Due to the severity of the attack, there are very few chances of a calf's recovery, unless strenuous treatment is given immediately.

The premonitory symptoms are hardly recognized, as the calf seems to look well when dropped and performs its function as regularly as a healthy one. After twelve to twenty-four hours, and sometimes even after thirty-six hours, the calf begins to scour an odorless, light yellow liquid. When this stage of the disease is reached, the calf looks dumpish, sleeps with its head on its flank, refuses feed, breathes fast; the excreta changes its color to a deeper yellow and in some cases becomes brown. The excreta eventually develop a fetid odor, constantly oozing out of the anus, and in some cases it comes out with great force and accompanied by flatus. At this stage the calf refuses all feed and unless vigorous treatment, as I will describe below, is given, it will die.

The cause of this disease is yet unknown to me. The bacteriological results of a post mortem held by Dr. Hadley, of the Wisconsin Agricultural College, can be summed up by saying that the swab obtained from the heart's blood revealed a bacillus

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\* Presented to the Keystone Veterinary Medical Society, Philadelphia, Pa.

similar to the colon bacillus, but it did not prove pathogenic to rabbits.

To prove that this form of scours is not the ordinary "calf scours," we isolated a cow and her stall was previously washed and scrubbed with a carbolic acid solution and whitewashed, 1/500 per cent. of the whitewash being bichloride of mercury. Fresh bedding was supplied that had never come in contact with any of the cows infected. The hind parts of the cow were thoroughly washed with antiseptics and every precaution taken, but the disease was reproduced in the calf.

Another cow was isolated in a barn some distance from the other barn and the foregoing method of applying antiseptics was followed, but the disease made its appearance.

Ordinary medicinal treatment for calf scours failed to check the dysentery, and Drs. Alexander and Hadley, of the Wisconsin Agricultural College, who were called for consultation, advised the trial of a polyvalent dysentery serum manufactured in a German laboratory owned by the Pasteur Institute.

My first experiments with the above serum began at the farm of a former governor of Wisconsin, Hon. W. D. Hoard, who owns a pure-bred herd of Guernsey cattle at Fort Atkinson, Wis.

The following experiments were carried on with five calves of different ages and diversity of attacks:

CASE NO. 1.—Called at 5 p. m., November 21. Calf born 8 p. m., November 18, developed scours after twenty-four hours. When seen, calf was prostrated, sleeping with head in flank. Respiration, 28; temperature, 101.8° F.; pulse weak and rapid. Refused food for twelve hours. Had several loose passages of a brown color and fetid odor. Injected 20 c.c. of polyvalent dysentery serum.

November 22, 9 a. m.—Calf looked brighter; would get up and accept milk offered to which 5 gr. of powdered opium had been added. Respiration, 22; temperature, 101.4° F.; pulse strong and bounding. 5 p. m.: Calf bright; had one loose pass-

age since injection, yellow in color. Temperature, respiration and pulse unchanged.

November 23, 9 a. m.—Sleeps and scours again; looks droopy and dejected. Conjunctiva highly injected. Respiration, 24; temperature, 102° F.; pulse strong and rapid. Feels chilly and shivers. Injected 10 c.c. of polyvalent dysentery serum. 5 p. m.: Calf seems better. Holds head up more. Conjunctiva still injected. Has had several passages yellowish white in color, liquid in consistency. Pulse strong; temperature, 102.4° F.; respiration, 24. Sleeps all the time. Weak, cannot stand up. Shivers.

November 24, 9 a. m.—Looks bright, jumps around in stall. Has had no passages whatever. Pulse strong; temperature, 102° F. Is very thin. Has had milk with 5 gr. of powdered opium. Responds to external stimuli readily and lays down cautiously. Has more strength in his legs. 5 p. m.: Looks bright, rests easy, holds head up high. Has had no passage yet. Takes food out of pail offered with 5 gr. powdered opium. Temperature, 102.2° F.; respiration, 22; pulse strong.

November 25, 9 a. m.—Is very bright. Takes food offered and eats greedily. Has had two passages during the night, normal consistency, yellow in color and devoid of offensive odor. Walks around stall and holds head up naturally. Temperature, 101.6° F.; pulse strong and full; respiration, 20. Recovered.

CASE No. 2.—Born 6 a. m., November 19.

November 21, 5 p. m.—Has been well for forty-eight hours, but developed scours after that. Does not care to suckle mother; sleeps. Temperature, 101.8° F.; respiration, 24; pulse weak and fast. Injected 10 c.c. of polyvalent dysentery serum.

November 22, 9 a. m.—Sleeps; scours dark yellow in color, very offensive odor. Does not suckle mother. Temperature, 102° F.; respiration, 30; pulse weak. Injected 10 c.c. polyvalent dysentery serum. Separated from mother. 5 p. m.: Quiet, sleeps; has had one passage of a thicker consistency than before. Has had 5 gr. of opium in milk offered in a pail and

accepted. Pulse strong; temperature,  $102^{\circ}$  F.; respiration, 24. Not strong enough to stand up.

November 23, 9 a. m.—Still lies down. Has had one passage, normal consistency; light yellow in color. Pulse strong; temperature,  $101.2^{\circ}$  F. Does not seem very strong. Looks emaciated. Accepted milk with 5 gr. powdered opium. Dull, does not respond.

November 24, 9 a. m.—Lies down yet. No great change since yesterday. 5 p. m.: Is bright, refuses food and had to be fed with milk bottle. Temperature,  $102.4^{\circ}$  F.; respiration, 20; pulse strong.

November 25, 9 a. m.—Has had several passages during the night. Yellow in color and natural consistency. Stands up, stretches, walks around stall. Feces has no odor. Temperature,  $102^{\circ}$  F.; pulse strong. Recovered.

CASE No. 3.—November 21, 5 p. m. Twenty-four hours old. Has been well and lively. Temperature,  $102.4^{\circ}$  F.; pulse strong; respiration, 24. Injected 10 c.c. polyvalent dysentery serum.

November 22, 9 a. m.—Calf developed scours. Discharges are thicker than No. 1 and No. 2. Yellow in color and slimy. Very faint odor detected. Pulse, temperature and respiration unchanged. Willing to feed. Received 5 gr. powdered opium with milk and accepted. Separated him from cow.

November 23, 5 p. m.—Lively. Keeps head up smartly. Ears erect, conjunctiva normal. Pulse strong; temperature,  $103.2^{\circ}$  F.; respiration, 20. Has had no passages since this morning which were thicker than yesterday.

November 24, 9 a. m.—Looks bright. Walks around stall. No passages whatever. External coat natural. Eyes bright and responds to calling. Pulse strong and full. Temperature, 103; respiration, 20. 5 p. m.: No change; no passage. Eats well.

November 25, 9 a. m.—Very bright. Had two passages during the night. Natural consistency and yellow in color. Bleats and plays around in stall. Recovered.

CASE No. 4.—Born 5 p. m., November 25. Born in an isolated barn stall which had been thoroughly disinfected and whitewashed with a 1/500 bichloride whitewash. Unused bedding has been spread and carbolic acid solution sprinkled on bedding. Cow's genitalia have been washed antiseptically for two days previous to parturition. Calf very large and healthy. Navel has been disinfected and tied.

November 26, 5 p. m.—Calf does not look very bright. A little redness noticed on anus. No signs of scours.

November 27, 9 a. m.—Calf developed scours. Injected only 5 c.c. of polyvalent dysentery serum. Discharges are yellow in color and of soft consistency, coming out with great force. Suckles well, looks bright. Temperature, 102° F.; respiration, 24; pulse strong and fast. Separated from mother.

November 28, 9 a. m.—Sours badly. Sleeps all the time. Refused food. Temperature, 101.8° F.; respiration, 28; pulse feeble. Injected 10 c.c. of polyvalent dysentery serum. 5 p. m.: Calf seems lively, no passages. Temperature, 102.2° F.; respiration, 24; pulse stronger.

November 29, 9 a. m.—Calf lively; accepted food offered in pail with 5 gr. powdered opium. Has had one passage, yellow in color and thicker consistency. No odor. Recovered.

CASE No. 5.—November 27. Calf born 6 a. m. in common cow barn, where Nos. 1, 2 and 3 were born. Calf a weakling. At 9 a. m. injected 10 c.c. polyvalent dysentery serum.

November 28, 9 a. m.—No dysentery developed. Eats well and sleeps much. 5 p. m.: Has had one passage of natural consistency, yellow in color. Recovered.

For lack of space I shall not mention other cases, but I can say that Case No. 1, which was so severe when treatment was given that it has remained stunted and is growing very slowly, while the calves treated soon after birth have made splendid recovery and are growing naturally. I may also state that Case No. 1 has developed pneumonia after four weeks' recovery, and is under treatment now for this affliction of which I will write in another article as soon as I collect more data.

In conclusion I may say that a calf given an immunization

dose of polyvalent dysentery serum (which is 10 c.c. and not less) immediately after it is born will not develop this dysentery. Those cases in which less than 10 c.c. have been injected develop a temporary immunity which does not last long, and have to be injected with the therapeutic dose afterwards, which is 20 c.c. Money and time will be saved by injecting 10 c.c. of the serum right at the start.

The serum, I am informed, is produced in the same manner as is all other true serums, viz.: from horses that have received repeated injections of the bacilli.

The same laboratory manufacturing the polyvalent dysentery serum also manufactures a germ-free extract of the dysenteric bacilli, which is used in connection with the polyvalent serum in conferring active immunity; it is claimed, will also be conferred on the unborn calf.

Both Baebenroth and Shupp, of Germany, have experimented with these serums and have used the simultaneous treatment, viz.: the immunization of the calf in utero, claiming very good results.

Just what changes undergo in the body as soon as the serum has been injected is not very clear to me. But according to the rise in temperature and the coloration of excreta discharged by the animal after the injection, I assume that it either increases the phagocytic power of the blood or it neutralizes the toxæmia produced by bacterial action or both. Should I be enabled to make a further study of this disease, and facilitated to make a bacteriological examination of the blood during the entire course of the disease, I shall subsequently report more definite data.

Undoubtedly the disease exists in utero and the calf is born with it. Just why the disease does not manifest itself immediately after birth or at the same time, I assume that certain conditions are necessary for the development of the disease.

As the germ-free extract is not as yet in existence in this country, upon its arrival I shall try to immunize the unborn calves and report my work to you hereafter.

Suffice it to say that, so far, I have found the polyvalent dysentery serum a good immunizing, as well as a reliable curative agent, and recommend it to the gentlemen in the profession to give it a thorough trial.

ADMINISTRATION AND COMMAND IN CANADIAN ARMY VETERINARY SERVICE.—The officer administering the Canadian Army Veterinary Corps shall be the director of transport and supplies. The principal veterinary officer of a command or independent district may be appointed from the regimental lists of the C. P. A. V. C. or C. A. V. C. or from the regimental veterinary service.

DUTIES.—Any officers holding the appointment of principal veterinary officer shall be responsible to the O. C. the command or independent district for the administration of the Canadian Army Veterinary Service, and shall command the C. A. V. Corps within the command or independent district. The commanding officer of the C. P. A. V. C. in a command or independent district shall be the senior C. P. A. V. C. officer of the detachment detailed for duty in the command or independent district.

DUTIES.—Any C. O. of the C. P. A. V. C. shall distribute the personnel of the C. P. A. V. C. allotted to the command or independent district by the O. A. C. A. V. C. as circumstances may require.

STORES.—Veterinary stores in commands or independent districts will be under the charge of P. V. C.

QUALIFICATIONS FOR CANADIAN ARMY VETERINARY CORPS.—Candidates for admission to the Canadian Army Veterinary Corps must make a written application to the officer commanding the command or independent district on M. F. B. 237. The minimum age of candidates is 21 years and the maximum 35 years, except in very special cases or on urgent occasions, when the latter limit may be exceeded. Candidates will not be accepted unless in the opinion of the Minister in Militia Council they are in all respects suitable to hold commissions in the active militia of Canada. Every candidate for a commission must be a graduate of a recognized veterinary college, and must be recommended by the P. V. O. of the command or independent district. Candidates on appointment shall be given the rank of veterinary lieutenant, but shall be required to undergo a qualifying examination within two years of their appointment.

*(Continued on page 685.)*

## THE PROBABLE INFLUENCE OF THE OPEN WATER TROUGH IN THE SPREAD OF GLANDERS.\*

BY A. T. KINSLEY, M.S., D.V.S., KANSAS CITY, MO.

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The control of glanders has concerned practically all civilized countries for several centuries. Sanitary regulations for the control of this disease have been modified from time to time in accordance with the newly acquired knowledge of the *Bacterium mallei*, which was positively identified in 1882. Experiments conducted by various investigators have thrown much light on the microbiology of the *Bacterium mallei*, and particularly upon those characteristics which are of prime importance in the sanitary control of glanders.

The general principles of the control of glanders in different localities are similar, but many of the details may differ because of variation of the factors concerned in the spread of this disease. Thus the control of glanders in rural communities involves the same principles, but it is not as difficult and does not involve the same details as the control of this disease in cities. With the present knowledge of the microbiology of the *Bacterium mallei*, glanders should be relatively easily controlled.

The control of glanders, like the control of any infectious disease, resolves itself into a clear understanding of three things: first, the length of time that the pathogenic organisms retain their virulence outside of the animal body; second, the source of infection and channel of entrance of the infectious agent; and third, the avenues of elimination of the infection from the animal body. The first and third actors mentioned will not here be discussed.

In general, bacteria gain entrance into the animal body either through the skin or through the mucous membrane of the diges-

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\* Presented at the Fifteenth Annual Meeting of the United States Live Stock Sanitary Association, Chicago, December, 1911.

tive tube, respiratory channels, genito-urinary system, or the conjunctival mucous membrane. The most important channel of entrance of the *Bacterium mallei* is still a disputed point, and many experiments, some valuable and some valueless, have been conducted to prove the most frequent channel of entrance of this micro-organism into the animal body. The *Bacterium mallei* gains entrance to the tissues of the body, either through the mucosa of the digestive or respiratory tracts, skin or ocular mucous membrane. The disputed point is, "Which is the most frequent channel of entrance?" It is possible that variation of the surrounding conditions may be responsible for the variation of the most frequent channel of entrance.

In referring to different authors, one finds varying opinions as to the most frequent channel of entrance.

Virborg, in 1793, recognized ingestion glanders. Simonds, Renault and Bouley produced glanders in horses by giving them water contaminated with the *Bacterium mallei*. Schütz, Nocard and McFayden transmitted glanders to horses proven to be free of infection by mallein testing, by introducing the *Bacterium mallei* directly into the stomach.

Friedberger and Frohner hold the view that the most frequent channel of entrance is through the respiratory tract.

"Inoculation in a skin wound or abrasion is the most effective mode of transmission, but the virus undoubtedly enters in certain cases with the air, food or water, or by the accidental lodgment of a speck of the virus on the mucosa of the eye, nose or other natural opening. Through the healthy mucosa the bacillus may enter, \* \* \* Skin, in its healthy state, is usually resistant, but Babes has conveyed infection by rubbing with virus mixed with vaseline \* \* \*. There is ample evidence that primary lesions appear not only in the skin and nasal mucous membrane, but also in the bronchi, intestines and other parts" (Law).

"I long ago arrived at the conviction that not only is infection possible by ingestion, but that this mode of introducing the poison is by far the most common" (Hunting).

From limited observations the writer is of the opinion that the open water trough is a source of infection and that animals do become infected by the ingestion of water contaminated with the discharges of glandered animals, as well as by contact with glandered horses while drinking, by licking discharges of glandered horses from the margin of the drinking fountain and by coughing and sneezing, thus forcibly carrying infected discharges from diseased to healthy horses.

The percentage of horses infected that drink at public watering fountains probably depends upon the type of fountain. To substantiate the foregoing views, the following data are presented:

Dr. S. H. Ward, of the Live Stock Sanitary Board of Minnesota, kindly supplied the facts and figures for St. Paul and Minneapolis:

| Year.     | St. Paul. | Minneapolis.     |
|-----------|-----------|------------------|
| 1904..... | 59        | 117              |
| 1905..... | 51        | 110              |
| 1906..... | 71        | 117 <sup>a</sup> |
| 1907..... | 34        | 48               |
| 1908..... | 15        | 13               |
| 1909..... | 4         | 5                |
| 1910..... | 8         | 7                |
| 1911..... | 0         | 7 <sup>b</sup>   |

<sup>a</sup>—(Fountains closed.)

<sup>b</sup>—(Up to the present time.)

A year represents the time from August 1 of one year to July 31 of the following year.

From the above table it is noted that glanders was quite prevalent in St. Paul and Minneapolis until the closing of the drinking fountains in 1906. Since that time the number of cases has diminished materially, there being only four cases reported in St. Paul and five in Minneapolis in 1909. Seven of the eight

cases in 1910 in St. Paul, according to Dr. Ward, were due to the fact that during this time glanders was discovered in a feed barn where over 120 horses were tested, of which 7 reacted and were destroyed. In Minneapolis during 1910 and 1911, the majority of horses killed were reactors found on testing horses in transit to other states.

Dr. D. F. Luckey, State Veterinarian of Missouri, and Dr. R. C. Moore, Deputy State Veterinarian, of Kansas City, Mo., kindly supplied the following data:

| Year.     | Kansas |        | Total. |
|-----------|--------|--------|--------|
|           | City.  | State. |        |
| 1896..... | 2      | 30     | 32     |
| 1897..... | 0      | 22     | 22     |
| 1898..... | 0      | 20     | 20     |
| 1899..... | 0      | 16     | 16     |
| 1900..... | 0      | 28     | 28     |
| 1901..... | 18     | 47     | 59     |
| 1902..... | 113    | 47     | 160    |

| Year.     | Kansas<br>City. | St.<br>Louis. | St.<br>Joseph. | Out<br>State. | Total. |
|-----------|-----------------|---------------|----------------|---------------|--------|
|           |                 |               |                |               |        |
| 1903..... | 296             | 10            | 1              | 56            | 363    |
| 1904..... | 83              | 5             | 3              | 101           | 192    |
| 1905..... | 69              | 4             | 0              | 24            | 97     |
| 1906..... | 53              | 23            | 0              | 37            | 113    |
| 1907..... | 78              | 14            | 0              | 27            | 119    |
| 1908..... | 84              | 37            | 10             | 49            | 180    |
| 1909..... | 67              | 23            | 0              | 26            | 116    |
| 1910..... | 86              | 16            | 0              | 4             | 106    |
| 1911..... | 58              | 12            | 4              | 22            | 96     |

Number of cases in Kansas City from 1896 to 1911, 995.

Number of cases in rest of state from 1896 to 1911, 624.

Number of cases in Kansas City, Mo., from 1901 to 1911,

993.

Number of cases in rest of state from 1901 to 1911, 408.

A year in the above tables is from December 1 to November 31, inclusive.

On reviewing this data, it seems that at first sight that no definite conclusions can be drawn; however, on an analysis of the various factors, this data is of considerable value. The first portion of this report, from 1896 to 1902, perhaps is not very accurate, as the efforts to eradicate glanders was not systematically applied. It is noted that there were 101 out-state cases in 1904. This was due to an extensive outbreak in a grading camp in which fifty-four horses and mules were found to be affected with glanders and were destroyed. The reason for the large number of cases in Kansas City in 1903 is explained by the fact that during June and July of this year many local veterinarians were employed to make a barn-to-barn canvass and examine each horse individually. During these two months over one hundred cases of glanders were officially diagnosed and destroyed; further, it may be stated that immediately following this canvass the public watering troughs were closed and remained closed until April, 1904, when they were again thrown open to the public use through the efforts of the Humane Society. During March and April, 1904, no cases of glanders were reported. During 1905 and 1906, the fountains were closed periodically, and it was noted that within six weeks after these fountains were closed the number of cases of glanders diminished. From 1907 to 1910 the watering fountains were left open most of the time and glanders in Kansas City was probably as widespread as in 1903, although the table does not so indicate. It was found that many cases of glanders were sent direct to the desiccating plant without being reported to the state, there being in some months as many as forty or fifty cases of glanders disposed of by this means, probably more than three hundred during the year. The

fountains were closed during 1910, and although from the above table there seems to have been an increase in the number of cases of glanders, this is explained by the fact that the members of the Team Owners' Association were active in locating and reporting all cases of suspected glanders, hence the official record includes practically all cases which developed during the year. The authorities have been led to believe that the cases of glanders reported the last year represent quite accurately the number of cases that appeared in Kansas City during that time. It is interesting to note that although St. Louis has more than double the population of Kansas City, Mo., relatively few cases of glanders have been reported from that city in spite of the fact that they have open drinking fountains, but the St. Louis fountains are of a different type than those used in Kansas City. The fountains that were in use in Kansas City were about four feet high and were relatively small and shallow, had flaring margins, and were not more than three feet in diameter. The size of the fountain facilitated contact between different horses when they were being watered as well as preventing a very great dilution of the discharges of horses drinking at the fountain, and the flaring margins favored the accumulation of discharges, three conditions which favor transmitting the infection to the horses watered at these fountains. The drinking fountains in St. Louis are found distributed over the city, are large, in some instances being as much as eighteen feet in diameter, three or four feet deep, and having perpendicular sides. These large tanks are an efficient means of diluting the discharges contaminated with the *B. mallei*, and the large tank also prevents contact with other horses drinking on the opposite side. The perpendicular walls do not favor accumulation of discharges:

The number of the cases of glanders in St. Paul, Minneapolis and Kansas City is apparently significant, and although these facts should be of some value in determining whether the water fountain is a factor to be considered in preventing the dissemination of glanders.

## THE GENERAL PRACTITIONER OF VETERINARY MEDICINE IN LIVE STOCK SANITARY CONTROL WORK.\*

AN ADDRESS BY DR. E. M. NIGHBERT, OF THE UNITED STATES BUREAU OF ANIMAL INDUSTRY, ATLANTA, GA.

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It is with a good deal of pleasure that I have this opportunity for the first time to appear before the Georgia Veterinary Medical Association. One in my position has the opportunity of being on the outside, so to speak, which brings to clear view the veterinary profession of various sections and localities. It is with much pride that I am able to state that the veterinary profession has improved in every way everywhere I have been.

The factors bringing about this great improvement and uplift and progress are, knowledge and education. Everything to-day is on a higher standard of perfection. These higher standards have been necessary in order that efficiency and qualifications may be assured. Knowledge is a thorough comprehension of what we have to deal with, while education is the fundamental principle necessary before accuracy and success will follow.

Ancient history reveals that practice of the veterinary art was plainly depicted on Egyptian frescoes, representing the administration to ailments of oxen and other animals years before the Christian era. Since that time the establishment of the profession of veterinary science has continued as civilization progressed and developed into fixed and definite governments.

In studying and thinking of the ancient development of our great profession, I cannot help but come to the conclusion that the main object in view, then as now, was to prevent the dissemination of the various animal plagues that proved a menace to the animal industry and the people of those days.

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\* Delivered before the Fifth Annual Meeting of the Georgia State Veterinary Medical Association, December 21, 1911.

In A. D. 69, Columella and Dolus Mendicius are mentioned as men of great influence in their profession at that time and highly efficient in the control of animal diseases. In A. D. 400, Vegetius Renatus plainly described sanitary measures in dealing with a serious cattle disease.

The profession of veterinary science is builded upon sound facts and a high principle; she has proven to be an absolute necessity in ancient and modern times. Modern times have placed a greater responsibility upon the practitioner, the municipal, state and national veterinarian—in fact, all connected with the profession, including the teachers and research workers. All are conscious of the public eye and responsibility of safe-guarding the nation's greatest necessity, the live-stock industry, against disease. Modern times have brought about rapid transit facilities for the movement of live stock, and legal measures controlling such movement. These measures have proven necessary for the protection of the public health and the health of the animal industry of the various states.

No law nor a few officers of the law of this nature are capable of accomplishing the results intended without the co-operation of the public, and especially the veterinary profession. It is here where the general practitioner may play an important part, because he is on the ground in close association with owners of animals who are interested in whatever sanitary measures affect their business.

To-day I am speaking from two viewpoints, namely: the veterinary profession as a practitioner, and from the position of a sanitary officer.

I believe it is fair to make this statement, because I have had long experience in both, devoting all my time and energy. I am sorry for but one thing, the mistakes made. Experience has completely convinced me that a practitioner is not in a position to proficiently conduct a practice and execute sanitary laws at the same time, no matter how well he may be qualified. The true sanitary officer builds in his make-up a great conservation principle: he has the welfare of the animal industry and the

public in mind with each act; he looks beyond the present and does not expect extra remuneration for each service rendered. In short, the sanitary officer is a public servant. The general practitioner, on the other hand, is a professional business man; his aim is to take care of what business comes his way and to be ever on the lookout for new business. His clients are his friends and counselors, and he is his friend's counselor should occasion arise necessitating the enforcement of sanitary measures on the live-stock property of such persons. Therefore, the general practitioner may be of a great advantage or disadvantage in live-stock sanitary control work. Every man may have a hobby, but a hobby that is very closely connected with the main avocation or business of a person has not in my experience been a success. To illustrate: The inexperienced graduate generally emerges from college with insufficient funds to equip himself for practice. He may seek a salaried position, expecting to develop a practice on the side, then one or the other, or both, suffers failure, and the public complains and the profession is condemned.

Forty-two states to-day have laws requiring health certificates for animals entering such states. The general practitioner is largely depended upon to safeguard such states in accordance with law against dangerous and communicable diseases of animals. Many thanks for such laws, because, in addition to the protection against disease that may result, the law has been the means of picking out the deceptive and dishonest person who willfully and knowingly makes a false report, no matter what his position may be.

In dealing with live-stock sanitary measures, certain fixed and definite rules are laid down for guidance; such rules are adopted after long experience and consideration by those best qualified on every phase of the subject. The laity and the unscrupulous person of position may not consider these laws seriously.

You will admit there must be a minimum and maximum deviation in executing laws and regulations of this nature. To

go further either way means failure to accomplish the real intent and purpose of the fixed scientific rule. For instance, in applying the tuberculin test, a test that is not questioned as to its accuracy and reliability when properly applied, a test that is demanded by forty-two states and nearly all enlightened governments. Why should a qualified person fail in applying this test accurately and with satisfactory results? If the test fails, it is willful and intentional on the part of the owner or person applying it, or ignorance of the mode of application.

The application of hog cholera serum, one of the greatest discoveries of to-day, the first precaution we read—it must be applied by a skillful hand, preferably a qualified veterinarian. Think of it, gentlemen, the responsibility that rests with you, the great position of trust, representing millions of dollars. Can you not afford to be honest, skillful and scientific? Qualifications, practicability and honesty must be uppermost in the minds of the profession in dealing with this great problem of live-stock sanitary control work, because the farm valuation of animals in this country represents to-day two and a quarter billion of dollars.

No problem pertaining to the diseases of live stock, which has proven a menace to the industry, has been too great for the American veterinarian and the live-stock husbandman to master or formulate measures to suppress or control.

The eradication of the cattle fever tick from this great Southland is the greatest work ever undertaken for an agricultural people in all the annals of time. If the general practitioner does not believe in this work, or that it cannot be done, it is because he has failed to keep step with scientific progress and the fixed and definite plans back of the movement. This great work, I am glad to inform you, is now so deeply rooted that failure is not considered. This work is a success now and will continue to succeed until completed. It started with the cattle owner on the farm; he freed his premises of this disease-transmitting parasite; the county started and freed itself; the state started and the nation started to push this work to completion. In the

past six years one hundred and forty thousand square miles of territory have been freed of this trouble and the road is now open for safe and profitable development of the cattle industry in the most favored section of the nation.

The veterinary profession is greatly indebted to the private practitioner; we are all in need of each other. The practitioner depends upon the men in the laboratory and in the field of research and the sanitarians for facts and a principle to guide them. Without this close relationship and co-operation and exchange of facts and experiences, little headway could be made.

I want to emphasize another point or two. Honesty and sincerity of purpose. It is a great blessing to be conscientious in our work; it will equal in results the skill and tact of any man. You have no scientific secrets that are worth the snap of the finger, unless it has been technically investigated, tried and confirmed by the profession and the scientists of the world. A scientific medical fact, to be of value even to one's self, must be known to the profession. To illustrate, all we have to do is to look into the history of scientific discovery of recent years and we see what Cooper Curtice, Theobald Smith, Kilborne, and Salmon, gave to the scientific world in the discovery of the cattle tick and its connection with disease. This discovery opened the great field of research on parasites of high and low origin and has cleared the way to some of the greatest scientific achievements of man.

I want to impress you of how small and insignificant we are in the professional world alone and how little can be accomplished single handed.

Your association has accomplished much, but you have still greater things to do and you should keep in mind concerted thought and action, and that the great plan of our veterinary institutions and associations and the definite rules and principles laid down for general practice and the execution of general live-stock sanitary control work were not made by one lone, selfish man.

## DO OUR DEMEANOR AND EQUIPMENT DISTINGUISH US AS PROFESSIONAL MEN WITH MEN OF OTHER PROFESSIONS ? \*

BY WALTER R. PICK, VETERINARIAN FIRST UNITED STATES CAVALRY, BOISE  
BARRACKS, IDAHO.

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When first asked by your secretary to read a paper at this meeting, I begged off, giving as an excuse the uncertainty of my being able to attend, but after thinking the matter over it occurred to me that your society was small, composed of only a few members, and that each one would have to do his part in order that each meeting should be a success, giving each member new food for thought and inspiring each practitioner returning to his clients to do better work and to maintain a dignity commensurate to the social and professional standing to which his chosen profession demands of him. It is my intense interest in the social and professional standing that a veterinarian should aspire to that prompts me to take up part of your valuable time at this meeting. I think the army veterinarian has this question placed before him more forcibly than any other branch of our profession; his associates are educated gentlemen and he will be received as just what he individually is and not necessarily as an educated gentleman, as many other callings in life places a man until he is found to be otherwise.

There is no denying that our profession has been under a ban for years, and why? It is because so many of the men representing us do not practice or aspire to the role of refined, professional men; and until our profession as a whole does this, we will be classified individually and the veterinary profession at large will be the loser. It is the duty of every veterinarian at all times to maintain towards each other a professional dignity, due gentlemen of the same vocation in life; critical remarks

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\* Read before the Idaho Association of Veterinary Graduates, October, 1911.

of a brother practitioner in the presence of the laity, or an attempt to discredit his professional ability, reflects more seriously upon the one who makes them than upon the colleague attacked, and far more than to either is the serious injury done to the profession at large; for no individual, society or profession is respected by the public more than he or it respects itself; and if we treat each other with disrespect, how can we expect the community or state in which we practice to regard us, or our vocation, with greater distinction than we practice towards ourselves? If our colleague has been guilty of an unprofessional act, the state society is the proper place for the matter to be brought up and discussed and not among the public; and right here, gentlemen, is where I want to emphasize the necessity of every qualified practitioner in the state becoming a member of the state association, for in unity there is strength, and if all are members no individual could afford to be in disrepute with his state association.

We should be proud of the wonderful progress made in the practice of veterinary medicine during the past few years. We find many of our colleagues marching shoulder to shoulder with the best of the sister profession, giving to the community in which he lives, and to the profession at large, services not gauged by dollars and cents, and receiving in return not only a satisfactory monetary consideration, but the respect and gratitude of his community and profession. This should be the aspiration of all veterinarians.

How can we best lay the foundation upon which to build a successful career?

The colleges at which we graduate are responsible for our technical and theoretical qualifications, but we ourselves are responsible for the manner in which we display them. I believe it the duty of every veterinarian to present as good a personal appearance as any professional man he meets; his private office should be as neat and as well furnished; his dispensary as clean and as well equipped as becomes a successful practitioner; his hospital should be an example of what a sanitary, up-to-date

stable should be; for are we not supposed to advise and educate our clients in stable construction and sanitation, and if we as veterinarians do not practice it at home, how can we expect our clients to put any faith in us or what we say?

Not long ago, while our squadron was on the march from Sequoia National Park to San Francisco, California, our quartermaster had occasion to go ahead of the column to find a camp site: upon making inquiries, he was referred to a veterinarian who met him with his machine, and after finding a suitable camp site returned to his hospital. The officer, telling me about it afterward, said it was the best-kept stable he was ever in; that his office and dispensary was as well furnished and equipped as any M. D.'s; and I remarked to him, "Why shouldn't it be?" I relate this to show what a good appearance means to the observing public. Such practitioners are paving the way for equal recognition with other professional men and are stamping out the old term of "horse doctor."

We of the army, I believe, feel the lack of proper place and equipment for the performance of our duty more than any of you, for we have in a great many cases very inadequate accommodations furnished us. I am glad to say, however, that we have a few posts with well-equipped hospitals, and I am pleased to state that the officers of the mounted branches of the service are recognizing and acknowledging the efficient work being done at these posts by the veterinarians in charge, and we are in hopes that these good results and reports will in time bring us the proper recognition.

Gentlemen, let us examine ourselves thoroughly. Are we keeping pace with the rapid strides of progress made in our profession? I sometimes think, when I read the advance work being done by men of our profession, that I am only a drone.

Your chosen state has a wonderful future; the completion of the great irrigation projects now under construction will place Idaho in the forefront of agricultural districts; her climate is conducive to the development of a great and profitable stock industry, and with this development will arise sundry and com-

plex sanitary questions which only the educated veterinarian can solve. Is the veterinary profession of the state of Idaho so establishing itself with its clients and state officials, daily demonstrating their ability to cope with the sanitary needs of the state, that they will seek your advice and abide by your judgment?

I know that the veterinarians of the state of Idaho compare favorably with those of any state in the Union, but the day has come when the veterinarian is not merely a medicine giver but a man versed in agricultural economics and an authority on questions pertaining thereto. I congratulate you upon your state association; I admonish each and every member to attend all the meetings, not alone for the technical and practical knowledge gained, which is always very profitable, for no two or three professional men can get together and discuss a subject but that each will be the wiser; also, by meeting together, each will become acquainted with the various situations in every part of the state, discuss the requirements necessary to the good of the profession, and for the formulating of regulations to be enacted into laws.

Gentlemen, I thank you for your invitation and for the pleasure of meeting with you. I trust that my remarks may be taken in the spirit that they are given, for my desire is that the community in which we practice and the profession at large will be the better for our having been veterinarians.

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Dr. D. F. Luckey, State Veterinarian of Missouri, relinquished that position on January 15 to engage in private practice and farming in Stoddard County, that state. We surely wish that the doctor's efforts in his new field of activity may be attended with the success that he so thoroughly deserves.

OUR AMERICAN HORSE INDUSTRY.—Our 6,000,000 farms have 25,000,000 horses and mules and 6,000,000 horses in our cities, towns and villages gives a grand total of 31,000,000 horses, greatest of any nation, at government valuation of \$110, is \$3,500,000,000. \* \* \*—*Live Stock Journal*.

## MAMMITIS.\*

BY R. MILTON WEIGHTMAN, OSWEGO, N. Y.

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In selecting my subject I thought I would choose one that had given me a great deal of trouble.

Some diseases which used to cause us great anxiety and worry have been made comparatively easy to treat by the scientific discoveries of the past few years, viz.: milk fever, with the oxygen treatment; colics and impactions with the hypodermic tablet treatment, and the many serums and antitoxins that we can keep on hand for immediate use, so convenient and easy to carry and apply.

But this common disease of mammitis, which we meet so often in practice, has always been very troublesome for me to treat successfully, and I have brought it forward in the hope of getting "more light" on the subject.

If we have a client with a thousand-dollar cow, and she loses a quarter from mammitis and the chance of ever making a record, we don't stand very high in his estimation.

Sometimes we have a case develop over night, without any apparent cause, when a good clean-out, with careful diet and thorough or almost constant milking, the case will respond to treatment very quickly and soon be well; but usually the cases are well advanced when we are called, some advertised cure having been used by the owner. Some cases are much longer developing, beginning with a scab on the end of the teat, the inflammation traveling up the milk duct into the udder and finally developing mammitis. This form seems infectious, and I believe many cases are caused from bacterial infection, by the teat coming in contact with the bacteria on the floor, while the

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\* Presented to the Central New York Veterinary Medical Association, November 28, 1911.

cow is in the recumbent position; the floor being soiled by the bad habit of milking these cases on the floor and not cleaning it away, or from a retained placenta or anything of a bacterial nature. Other causes, such as cold drafts; sudden changes from hot to cold, wet weather, kicks, blows, barbed-wire cuts, a teat stepped on and cut or crushed, poor milking, improper feeding, hefting or stocking for sale, and many others which you all know.

But no matter what the cause, I always find mammitis a difficult disease to cure and bring the patient back to her normal flow of milk.

A good deal of the care has to be given by the owner or hired help, and in protracted cases they are apt to get discouraged and the case, very much neglected, ends badly.

The treatment is to remove the cause, if possible.

Internally, clean out with epsom salts, either one large dose or small doses in conjunction with nitrate of potash, or eserine and pilocarpine can be used; if the fever is high, a few doses of aconite, and stimulants during a chill if seen during that stage.

Externally, blanket, keep body warm, clay dressing and cotton, camphorated oil, phytolacca or belladonna ointment, iodoform and oil injections, sodium or hydrogen peroxide irrigations, iodine. If the udder is very swollen and heavy, a suspensory bandage should be applied with proper holes for the teats, so that milking can be continued without disturbing the dressing, as it is most important in all cases to milk out often and keep the bag empty, using the tube if milking by hand causes pain; if the udder has got indurated, so hard that you cannot make any impression, mercurial ointment, camphor and linseed or olive oil mixed and applied two or three times a day.

The old-time method of putting a hungry calf to a cow suffering from mammitis is atrocious and cruel.

If the teat cannot be kept open and the contents of the bag milked out, abscess formation must take place; then the case must go to the knife, and when pus is once detected the sooner it is let out the better. If gangrene develops, which is not at all

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unusual, and may develop in a very short time, and usually in the teat, promptly remove all parts affected, apply chloride of zinc solution until the destruction is controlled, then heal up by packing with white lotion and cotton or healing powders.

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THE MINNESOTA VETERINARY MEDICAL ASSOCIATION at its fifteenth annual meeting in St. Paul, January 10, 11 and 12, enacted the entire program as published in the January number of the REVIEW and, in addition, had a very successful clinic at Dr. Chas. E. Cotton's most excellently equipped hospital in Minneapolis on the last day. One of the especially interesting and satisfactory features of this meeting was the presentation of "Stallion Board Work," by Mr. Montgomery, assistant secretary of the Minnesota Stallion Registration Board, with a horse for clinical demonstration, at the university farm, examinations and discussions being taken part in by a large number of the veterinarians present. This was especially *a propos*, as great effort is being made in Minnesota to secure the most cordial and helpful co-operation between the veterinarians of the state and the Stallion Registration Board management. Stallions are not allowed to stand for public service in that state until a qualified veterinarian has examined them and attested to their freedom from infectious disease and transmissible unsoundness. Another thing that added very materially to the enjoyment and edification of the members was the fact that the Minnesota State Live Stock Breeders' Association was in session at the same time. Several veterinarians attended the breeders' association banquet, a very good example for veterinarians in general to follow. Dr. J. N. Gould, of Worthington, Minn., spoke for the veterinary profession in the after-dinner program. According to a provision by law, which the Minnesota Veterinary Association has created, it had three voting delegates as usual to the State Agricultural Society (State Fair), President Mack, and Drs. McGillivray and Amos. This evidence of progression and expansion in importance of the Minnesota association in relation to the live stock industry of its state impresses us and makes us wonder if in any other states the state veterinary associations have a voice in the management of their State Fairs. We wish that *all* might have.

## REPORTS OF CASES.

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### MY OBSERVATIONS ON OVARIECTOMY OF THE MARE.\*

By H. FULSTOW, Norwalk, Ohio.

Ovariectomy, or castration of the mare, is an operation that is chiefly performed for the relief of nymphomania.

Mares that are affected with this troublesome affliction are a source of great annoyance to their owners and, in fact, to anyone who has the care and management of them. They are irritable and ticklish, and if anything happens to touch them they kick, switch and urinate. If they are hitched they get straddle the pole or over the cross-bar, or get tangled in the harness, and sometimes run away and do a great deal of damage.

Others will be just the opposite; they will kick all of the time when not in heat, but when they are in heat will be gentle and tractable.

Again, others will not kick at all but will switch and urinate, especially when another horse happens around or you touch them with anything.

This operation is not a new one by any means, but it is the *modus operandi* which is now practiced that relieves it of the great dangers that accompanied it when the flank operation was in vogue. As far as I know, no one ever attempts the flank operation on a mare, although it is performed successfully upon cows.

Prof. Williams, of Ithaca, N. Y., was the first one, I think, in this country to perform this operation to any extent, per vagina, and in 1900, while at Detroit, I heard Prof. Williams describe his *modus operandi*, which seems to be a very safe way of operating.

Out of 87 mares that I have operated upon per vagina, I have had only one fatality, and that was from hæmorrhage, and one of them was in foal at the time at the time of operating, and I

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

did not know it until I had cut into her. Of course, I must admit it was carelessness on my part in not finding out that the mare had been bred, and furthermore, had I examined her before I commenced to operate, I would have known that she was pregnant and would not have attempted to operate upon her at that time. But fortunately, no complications arose; she never missed a meal, as some of them have done that were not in this condition. She went on and had a live foal about four months afterward.

While I have had only one fatality, I have had three or four that developed abscesses and one or two that got constipated and showed colicky pains. But by close observation and treating the different complications as they arose, they went on and made good recoveries.

When I first began to operate, I took any mare that came along, regardless of the history, but I had not operated upon very many before I found that the results to be obtained were a complete failure in some cases, while in others they were all that could be desired.

I think I can safely say that 95 per cent. of all the cases I have operated upon had one or more ovaries that were cystic.

There is no doubt in my mind but that all of you have run across some cases of this kind, and when you do, just what to advise your client as to the results to be obtained by operating is the question to be decided.

Now, I have arranged or divided them into three classes:

1. Mares that are mean when in heat only and those that are continuously in heat but do not kick, will be cured by ovariectomy.

2. Some mares that kick nearly all the time, whether in heat or not, will be cured by the operation. Some others will be benefited, and in some few cases it will do no good.

3. Old mares that have kicked for years and have contracted the habit, and those that kick all of the time when not in heat, but when in heat are gentle, the operation will not benefit at all.

#### MODUS OPERANDI.

All the instruments needed are a Colin's scalpel and a spaying ecraseur.

The first and most essential thing is to examine the patient and make sure that she is not suffering from any contagious or

infectious disease, and that she is otherwise healthy. Also inquire whether she has been bred or not.

Then, if the animal has been kept up on dry feed, it is a good plan to give a laxative to clean out the intestinal tract and feed her on bran mashes with a little hyposulphite of soda in it.

The tail, vulva, and all external posterior parts should be well cleansed with warm water and soap and then a 1-1000 bichloride of mercury solution. Place a sterile bandage on the tail.

Just before the operation give a rectal enema to remove all fecal material, and then the clitoris and lips of the vulva are cleansed of all sebaceous material and dirt by using a 50 per cent. alcohol solution. This must be immediately removed by a  $\frac{1}{2}$  per cent. soda bicarb. solution, to prevent irritation of the mucous membrane of the vagina and straining on the part of the mare.

Once more the posterior parts are cleansed and given a 1-1000 bichloride bath, and a clean, sterile bandage applied to tail. Now she is ready for the operation, which may be performed with or without anaesthesia, the one without seeming more popular, more practical and somewhat safer.

When ready, place the animal in stocks, if you have them; if not, you may use a sling or hippo-lasso, which does very well. But I prefer stocks.

By means of ropes, surcingles and hopples, secure her so she can neither lie down, rear up, strike, kick, or swing her head from side to side, and have an assistant to elevate the tail.

The instruments, which have been previously sterilized by boiling in soda bicarb. solution, are handy.

You must have a reliable assistant to hand you the instruments and to work the ecraseur.

The operator's hands and arms must be as nearly sterile as possible, as the success or failure of the operation depends greatly upon the antiseptic precautions taken.

The vagina is ballooned, that is, made to dilate and draw its walls tense, by introducing a warm, aqueous solution of soda bicarb., then going in quickly with the Colin's scalpel in the right hand and just to the right or left of the median line, and above the os uteri; make a forward thrust with the unsheathed blade of the knife. Don't cut upward, or downward, or any further in than is just necessary to puncture the wall of the vagina and the peritoneum covering it at this point. Then withdraw the hand, wash the hand and arm in a sterile water or a solution of

soda bicarb., and then, by introducing first one, then two, and then three fingers, dilate the wound so the whole hand may be passed through the incision. Then follow the uterus to its bifurcation, and then each of the horns to the ovary on the far extremity.

After locating each of the ovaries in this manner, draw out the hand, tighten the chain of the ecraseur so it will just slip over the ovary easily, and going in again slip the loop over the organ, tighten the chain slightly so the ovary will not slip out, and then make sure there is no loop of intestine in the ecraseur. The chain should be well down on the ligament and fallopian tube. The assistant takes off the ovary by the ratchet-like movement of the instrument. This should be done slowly, and the operator keeps the ovary in his hand till it is severed and out of the body. Then clean everything and take off the other ovary in the same manner. It is more convenient to use the right hand for the left ovary, and vice-versa.

After both ovaries have been removed, the vulva and external parts are cleansed of all blood, if there is any, and the posterior parts sponged off with a clean 1-1000 bichloride solution; and the mare is taken out of the stocks, blanketed according to the weather, walked for about two blocks, and then placed in a good, roomy box stall with plenty of good, clean bedding, and she must have very good attention; given only laxative food and not too much of it. And continue to give one ounce of artificial Carlsbad salts three times a day in water or mash.

If colicky pains develop, it is due to infection at the seat of incision and a small abscess there, or to constipation and the full rectum pressing on the wounded vagina.

If there is an abscess, it may be opened from the vagina, by the fingers or the scalpel. And if there is fever, give large doses of quinine. If it is due to constipation, give frequent enemas to remedy this.

After six or seven days of close observation, if no complications arise, and she is feeling good, send her home and she may be put to work as soon as she is in shape. But the owner must be careful till she has had time to forget her old habit.

The most important things to be remembered are to be sure that the mare is in good health before the operation; not to use strong, irritating antiseptics in the vagina; not to puncture the vagina till it is ballooned, and if it collapses before you puncture

the first time, balloon it again, and be sure to keep the bowels open, and to watch for colicky pains, or a rise in temperature.

The flank operation is not as practical for the mare because it is apt to lead to a septic peritonitis, and, besides, the ovaries are not as easily reached from that opening as from the other.

You will find this operation, as above described, a comparatively safe and easy one, and a means of making a good mare out of a practically useless one.

#### CASE REPORTS.

*Class No. 1, Case No. 1.*—Black mare, seven years old, draft breed. History: Kind and gentle when not in heat, but when in heat kicks and urinates, gets straddle the wagon pole, becomes unmanageable, and runs away. She was becoming worse every time she was hitched. I advised ovariectomy and performed it. The operation was successfully performed and no complications arose. The mare was kept quiet for ten days and fed a light diet, after which time she was put to light work, and after two years' observation I can say she was cured.

*Case No. 2.*—Gray mare, seven years old, roadster, pacer, with quite a burst of speed. History: Kind and gentle till in the summer of her fourth year, when one day as she was in heat and being worked out, she kicked herself free from the cart, and every time she came in rut after that she would kick. But she was gentle between times. I advised breeding, which was done, and the mare got in foal and was gentle all the time she carried it. But after foaling she was worse than ever; although she was bred several times, she failed to get in foal again. My advice was sought, and I advised spaying, but the parties thought it was too risky, so traded her off to an implement dealer, and then I traded for her for the express purpose of performing ovariectomy. Ovariectomy was performed; no complications arose until the tenth day, when she came down with influenza in a mild form. After getting well from the influenza, I hitched the mare without kicking strap, and drove her about every day for eighteen months to a buggy. About six months after the operation, while out making a call, she was stepping along in good shape when she suddenly became frightened at an object by the roadside and stopped; the outside belly-band broke and let the cross-bar onto her behind. You may be sure I was looking for some trouble, but she never wiggled her tail. I got out, made a belly-band out of my tie-strap, and went on as if nothing had happened.

*Case No. 3.*—Sorrel mare six years old, roadster. History: This mare appeared to be in heat all the time; she would switch, strain and grunt when another horse came around, or you happened to stop her in the road to talk to anyone. But she did not kick. Ovariectomy was performed and she recovered without complications. This mare was completely cured.

*Class No. 2, Case No. 1.*—Bay mare, roadster, eight years old. History: She would switch, kick and urinate all the time, whether in heat or not. Ovariectomy was performed; no complication arose: she only kicked once, about four weeks after the operation, and then did no damage, but she kept squealing for six months or more and finally stopped that. Now, after about eighteen months, she is a good, serviceable mare and is apparently kind and gentle, so that the owner's wife drives her everywhere.

*Case No. 2.*—Bay mare, seven years old, general purpose. History: Kicks, whether in heat or not, in the barn, and it is quite a "chore" to harness her. Also kicks when hitched, especially if a line or anything happens to touch her. Ovariectomy was performed, and the mare did well till five days after the operation, when she refused food, looked around at her side, appeared dull, had an elevated temperature, and her bowels were constipated. An examination revealed an abscess at the point of incision, which was evacuated with the finger. The constipation was relieved by rectal enemas and artificial Carlsbad salts. She also had a few doses of echinacea for the septic condition. In about a week she was sent home entirely well. She has not kicked since, now over a year.

*Case No. 3.*—Bay mare, five years old; grade, German coach, used by a liveryman. History: She was in heat all of the time; she would kick, switch and urinate, and was practically useless. Ovariectomy was performed and she recovered nicely from the operation, and was put to work, but occasionally she would kick. However, she was much better than before the operation.

*Class No. 3, Case No. 1.*—Gray mare, draft breed, aged. History: She would kick when in the barn and when at work. Ovariectomy was performed, and she got along nicely from the operation, but the owner said she was worse, if anything, than she was before the operation.

*Case No. 2.*—Bay mare, twelve years old, draft breed. History: She kicks all the time when not in heat, but when in heat she could not be made to kick. Ovariectomy was performed; no complications arose, the mare was taken home; but I can't say she was one bit better than she was before the operation.

*Case No. 3.*—Bay mare, cob, aged, well-bred roadster. History: She was switch, kick and urinate, and run away. I advised him to trade her off, as, in my opinion, the operation would do her no good. But he had seen one or two that had been operated upon and made good mares, and he wanted to take the chance. So I operated upon her. The operation was successful, but the patient still kicks and runs away.

In writing this paper I have given you my personal observations, so you can draw your own conclusions as to the results to be obtained.

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## RUMENOTOMY WITH A PERMANENT OPENING FOR THE RELIEF OF CHRONIC HOVEN.

By E. A. WESTON, G.M.V.C., B.V.Sc., Perth, Western Australia.

The subject of this operation was a valuable Ayreshire bull imported into Tasmania by a prominent breeder. Shortly after his arrival he was exhibited at one of the leading shows, where he took first prize in the two-year-old class. Unfortunately he had a bad attack of tympanitis of the rumen, and his owner punctured him with a trocar and canula. From this out these attacks recurred with increasing frequency, and the bull was punctured on several occasions by his owner. My advice was now sought, and I immediately prohibited the use of the trocar and canula and substituted the probang; meanwhile putting the bull on a long course of nux vomica, bicarbonate of soda and ginger. For a time he improved, but the tympanitis recurred and at length became so bad that the probang had to be passed twice daily. During this time the bull had wasted to a skeleton, and his owner gave him away to a neighbor, Mr. Barnard, President of the Dairymen's Association—merely stipulating that he should have the use of him (the bull) should he recover. Mr. Barnard again consulted me and suggested that the bull's life might be prolonged if a permanent opening into the rumen could be made. This I agreed to do, and having chloroformed the patient, I cut down on the rumen, which proved to be partly adherent to the peritoneum. After making an opening into the rumen, somewhat smaller than that through the skin and muscles, I stitched the edges carefully together. That night, when sitting in the dining room, we could hear an extraordinary sound pro-

ceeding from the stable, which proved to be the bull grinding his teeth. He would fix himself into position and go through the performance of throwing a cud, but the hole in the rumen seemed to prevent him from fixing the diaphragm and carrying out the process of forcing the wad of food into the œsophageal opening, and no cud passed up the œsophagus. He, however, seemed to think it ought to be there, and worked his jaws with great vigor, hence the sounds we had heard. Some days afterwards I received a note from Mr. Barnard saying that the bull was doing splendidly, and that "when he was not eating he was chewing his cud, and when he was not chewing his cud he was eating." Shortly after this I left Tasmania to take up a position in the Stock Department of Western Australia, and I heard no more of my patient for seven months, when I wrote to Mr. Barnard to know how he was getting on. The following is his reply:

"The bull is doing well, and during the summer grew a great deal. He is in capital order and this new outlet does not seem to bother him at all. Once it got blocked with a wad of grass and my efforts to remove it were disastrous to my clothes. He blew up at once, showing pretty clearly that without the hole he would be as bad as ever. It has healed up to about one inch in diameter. If it could have been about an inch and a half higher it would be better, as he would not overflow quite so much."

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## OESOPHAGEAL PULMONARY FISTULA IN A PIG.

By E. A. WESTON, G.M.V.C., B.V.Sc., Perth, Western Australia.

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*"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."*

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While inspecting some piggeries yesterday, I came across a case which is a novel one so far as my experience goes, and may prove of interest to some of your readers.

The subject was a white sow, who, her owner stated, had been ill for three weeks. He informed me that he had carefully studied the case, and consulted "Long's Book of the Pig," with the result that he had diagnosed the trouble as "gastritis." The

animal had a temperature of 105.5° F. and showed evidence of long-continued fever in her wasted appearance and dry, scaly skin. She had evident trouble in respiration, her breathing being short and rapid, while handling her produced a husky, rasping and continuous fit of coughing; reminding one of verminous bronchitis. However, when I came to use the stethoscope, I was at a loss to know what to make of the case. Some sounds suggestive of pleurisy could be heard on the left side, and nothing on the right. I advised the owner to slaughter the animal as there was some serious lung trouble, the nature of which I was unable to determine. This he consented to do, and post mortem revealed a curious state of affairs. The pig had swallowed a sharp piece of tin, pointed at both ends and closely resembling a small lanceolate leaf. This had traveled down the oesophagus till it reached about the middle of the thoracic cavity, when it had cut clean through the walls. Instead of the food escaping into the thoracic cavity, as one would have imagined, a sinus had formed leading into the lung. The pulmonary pleura had become detached from the lung, thickened, and firmly adherent to the thoracic walls, forming a cavity capable of holding a small cupful of food. Into this, portions of ingesta had continued to pass, and it was filled with debris containing split peas, wheat, oats, etc., while an abscess had formed in the diaphragm. This extemporary pulmonary stomach (if I may so term it) interposed between the lung parenchyma, and the thoracic wall was what had effectually prevented my hearing any sounds on that side. The abdominal organs showed no evidence of disease. One can only wonder how the pig lived so long, and she should take her place on the immortal scroll of fame with that legion of tough old cows who have at various times managed to live for weeks and weeks with hatpins, wire nails, pocket knives, umbrella ribs, barbed wire, plain wire and various other choice morsels penetrating their internal anatomy.

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### MULTIPLE INTUSSUSCEPTION IN A CALF.

By A. J. DAMMAN, D.V.S., M.D.V., Ellensburg, Wash.

I was called to see a calf owned by a farmer living seven and one-half miles out of town, October 6, 1911. The owner said that he had lost one the day before which appeared just the same

as this one. He urged me to hurry, or it would be dead before I would get there; and so it was. The post mortem was made by Dr. C. P. Clark and myself and revealed the knotted intestines as shown by the cuts, which were of all lengths, ranging from



PLATE No. 1.

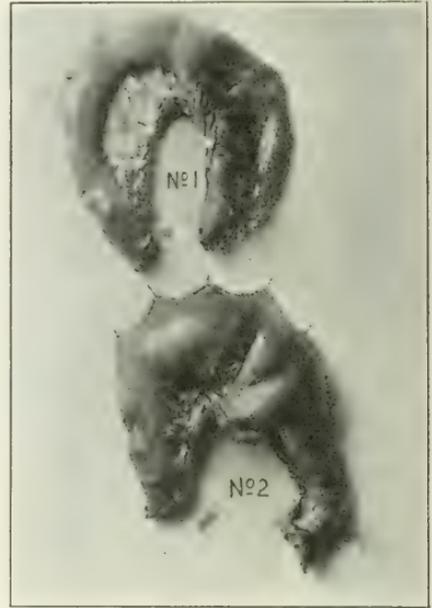


PLATE No. 2.

one inch to six inches of a telescope; there were 16 of these knots. The owner said that the calf was in great pain, would bawl as if it was being horned, and stamp its feet just like a horse with the colic. Plate No. 1, Cut No. 1, will give you an idea how the smallest appear, and Cut No. 2 in Plate No. 1 shows the larger ones; Cut No. 1, Plate No. 2, shows how the intestine was telescoped. The light part of the intestine was doubled back into the dark part of Cut No. 1, Plate No. 2. The calves had been running on pasture containing clover, alfalfa and timothy; also fed skim milk once a day. The grass had been frozen quite hard for a night or two before the calves took sick. There were ten or a dozen others which showed no bad effects. I questioned the owner as to whether the calf could have been kicked by a horse, fallen from a high bank, or squeezed through a small opening; all of which he answered in the negative. Will say

that all organs were normal and there was no gas in any of the telescoped parts.

What was the cause of the knotting? A free expression of opinion by REVIEW readers is requested.

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### LEAD POISONING—A LEGAL DECISION.

In the suburbs of the city, where the Duke of Connaught, Governor General of Canada, resides, a large area of land is being subdivided into lots and sold for building purposes. Approaching this area a large field sign was erected in a field at the instance of a real estate company and painted by a sign painting company. A landscape was designed and painted in striking colors with the name of the real estate company in conspicuous letters at one side. The property is part of the estate of Mr. Keefer, a white-haired old gentleman who installed the now extinct horse cars in Canada's capital many years ago, and was leased to a Mr. George Farmer for pasture purposes. The real estate company contracted with the sign company to erect it, but did not obtain the permission of the owner or lessee of the land. A few days after erected, two of Mr. Farmer's cows died, and a post mortem by Veterinary Surgeon Harris, of Ottawa, revealed that they had died from lead poisoning, such as found in paint. The veterinary surgeon inquired if there was any paint around the premises that the cattle might have eaten, and on examination quite a quantity of red, green, black and white paint was found within a radius of twenty feet of the sign. He at once attributed the cause of death to the cows eating the paint, a portion of which had evidently been thrown out of the cans when the painters had finished their work; for it was found in a copious batch several feet from underneath the sign. A quantity of the grass saturated with the paint was produced as an exhibit in the court. On the evidence the court held that the plaintiff had good ground for action and was entitled to damages, but just as to the relative responsibility of each of the defendants his Lordship had to do some deep thinking. The real estate men, it was pointed out, were primarily responsible for ordering the sign men to go there without having first obtained permission, but on the other hand the real estate men did not want to be blamed for what they regarded as negligence on the part of the painters in

throwing the paint around so that the cows could eat it. The sign men held that they were simply acting on the instructions, that the real estate company knew that there was an element of danger in the work and had no business to send them there to do the work without first notifying the plaintiff so as to give them an opportunity of taking precautions against the cows eating any grass from around the sign, as some naturally would fall from the brush in the process of the work. After a lengthy legal argument the court condemned each defendant to pay one-half of the amount paid for the loss of the cows.

### AN INTERESTING HOG.

By E. JACKSON, South Omaha, Nebraska.

This is a picture of the much-talked-of mule-footed hog, taken by Dr. Andrew English, of the South Omaha B. A. I. force. The hog is hanging by the gambrels, head downwards.



Another peculiarity shown by this picture is the growth of the wattles on the jowls. These are a fatty growth with a small arrow of cartilage, and a few muscular fibres running parallel with the cartilage, extending the entire length through the centre of the growth.

These wattles are not false teats, as supposed by some, this being the picture of a barrow hog. Neither are they the result of branding, as there is no scar tissue present. It has been contended that these growths were brands similar to the dewlap brand often seen on cattle.

## ABSTRACTS FROM EXCHANGES.

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### ENGLISH REVIEW.

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

MESENTERIC TUMOR CAUSES INTESTINAL STRANGULATION [*William S. Mulvey*].—Black hunter gelding has had a fairly stiff day's cub hunting, and is apparently not the worse for it. He seemed well up to late in the afternoon, when he had a sharp attack of colic. Draught is given followed by dose of physic. Later in the evening he is rather worse, his attacks are sharp, and at varied intervals sedatives and enemas are prescribed. The next morning he is dead. The post mortem showed a tumor of fatty nature suspended from the mesentery by a peduncle some eight inches long and attached some six inches below the right kidney to the muscular wall of the abdomen, having a small foramen through which a loop of intestine had passed and become strangulated.—(*Vet. Record.*)

ANEURISM OF THE POSTERIOR AORTA [*Henry B. Eve, M.R.C.V.S.*].—A thoroughbred brood mare, in foal, aged, 16 hands high, is taken to her stable, ate her feed and within a quarter of an hour is found dead in her stall. The post mortem revealed the cause of death to be due to a rupture of the posterior aorta, whose walls were found in an atheromatous condition. The animal had not been tied up, was not cast and died without a struggle.—(*Ibid.*)

SERIES OF CLINICAL HORSES [*Prof. J. J. O'Connor, M.R.C.V.S., of the Dublin Royal Veterinary College*].—*Castration of a double rig.* Operation described as follows: Incision of a transverse fold of the skin over the near external inguinal ring; exposure of a large plexus of distended veins equal to a man's thumb; exploration of the inguinal canal where the epididymis was found enveloped with fibrous sheath which was open; traction upon it to draw the testicle; failure in doing so, the hand

was passed to the uppermost and outermost part of the canal, the anterior wall was punctured, and with the two first fingers inserted into the opening the testicle was found soft and flabby and removed with the ecraseur. Same steps were followed for the second testicle.

*Thrombosis of the Iliac Arteries.*—Case of a seven-year-old mare which presented the ordinary symptoms of this lameness and at the post mortem of which was found a large, pale clot distending the posterior aorta at its division with the iliacs, all of which, except the right, were apparently completely occluded. There was also a large aneurism with calcareous walls in the posterior mesenteric artery. The mother of the mare suffered of a similar affection.

*Rupture of the Colon in a Horse.*—Old bay gelding manifested colics and died. At post mortem the abdominal cavity contained large quantity of food and sand. There was a large rupture of the first part of the double colon. There was also one of the stomach.

*Sinus in the Axilla of a Polo Pony.*—Record of the case of a pony which got staked jumping a fence, and was seen by the writer eighteen months after. Lameness and discharging fistula on the near axilla. Animal was cast, opening of the fistula enlarged and the broken-off top of a cut hawthorn bush was extracted. Complete recovery followed.

*Abnormal Quantity of Fat in Temporal Fossa of a Horse.*—Trotting horse had doughy swelling in the near temporal fossa. The eyeball has cataract and protrudes considerably. An incision was made over the centre of the swelling, which was found composed entirely of fat. It was removed. Also was the useless eyeball. The animal was then cured of a shying disposition which rendered him difficult to handle previous to the operation. —(*Vet. Journal.*)

INTUSSUSCEPTION [*Licut. H. C. Stewart, A.V.C.*].—Aged bay mare is suddenly taken with spasmodic colic. She has severe acute spasms, no distension of the bowel, normal temperature, no peristalsis audible, but borboryms. She endeavors to roll on her back. Rectal examination revealed presence of a cord-like, painful swelling. Rectum quite empty. Notwithstanding careful treatment the animal dies. Post mortem revealed ruptured stomach. Floating colon shrunken and empty. A dung-ball as big as a man's head and containing gravel, nails and screws were

found in the fourth portion of the double colon. Two small dung-balls were found towards the pelvic curvature. The small intestines contained blood and an intussusception found measuring about six feet. There was strangulation of the invaginated portion. After reduction and evacuation of the contents the invaginated portion measured  $7\frac{1}{2}$  feet and the invaginating 20; making a total of  $27\frac{1}{2}$  feet of intestines involved in the diseased process.—(*Vet. Rec.*)

LYMPHO-SARCOMA IN THE DOG [*E. Wallis Hoare, F.R.C. V.S.*].—This Irish water spaniel dog had distemper, and on recovering from it had a peculiar appearance of the eye and a number of enlargements on the skin in various parts of the body. He had acute conjunctivitis, and these hard, flattened swellings are observed over him. He shows distress when exercised. After a few days some of the tumors of the skin ulcerated, the lymphatic glands became enlarged. The dog was destroyed. Autopsy: Small amount of fluid in the pericardial sac. Liver enlarged and congested. Abdominal lymphatic glands enlarged. Examination of these glands and cutaneous tumors revealed them to be round-celled sarcoma.—(*Vet. Rec.*)

CHRONIC BURSTITIS IN A DOG [*Prof. J. J. O'Connor, M.R.C. V.S.*].—Irish wolfhound had a swelling on the left ischial tuberosity with callous ulcer, the opening of a cavity lined with hard granulations. With cocaine injected, the dog was operated. The opening enlarged, the lining of the cavity dissected and the cavity dressed with tincture of iodine and later with antiseptic powder, nitrate of silver, etc. Biniodide of mercury was applied to stimulate the absorption of the cicatricial tissue.—(*Vet. Journal.*)

FISTULA ON THE RADIUS OF A SETTER [*By the same*].—Dog got bitten by another on the right foreleg. After three months the wound is not yet healed. There is swelling hot and painful, and two fistulas, one on each side. Anæsthetized with the chloroform, the fistulas were incised and curetted, a cavity made in the bone, leaving the fistulas communicating. Dressing of iodoform and boric acid was used. After a fortnight small pieces of loose bone came away and the dog rapidly recovered.—(*Ibid.*)

CAVALRY COLLISIONS IN WAR [*Lieut. E. Lishman, A.V.C.*]  
—This is the interesting record of three post mortems due to

such accidents of collisions in horses galloping into each other, as would be the case in war in cavalry charging cavalry. Two of the horses had accidentally been galloped into each other head to head, and just before the impact took place one had raised its head, so that the full force of the collision was between the horse's mouth and the other's cranium. Both dropped instantly as if they had been shot. One had its brain penetrated by the upper incisor of the other, three of which were found broken off in the brain substance. The other head showed that the three upper incisors were broken and also considerable hæmorrhage at the base of the skull. No fracture could be detected after boiling. The vertebrae were also normal.

The third horse had been galloped into by another while standing still, had been knocked down, manifested colic and died two hours after. The autopsy showed a rupture of the stomach with the contents scattered in the peritoneal cavity.—(*Vet. Rec.*)

ABDOMINAL WOUND WITH INTESTINAL PROTRUSION IN A CAT [*E. Wallis Hoare, F.R.C.V.S.*].—Cat fell through a greenhouse roof and sustained two wounds, one in the abdominal region, in front of the umbilicus, and the other on the left flank. This last did not extend through the abdominal muscles, but the first did. It easily admitted three fingers, had a jagged character, and through it protruded a large amount of intestine. This and the omentum were soiled. Chloroform was administered, torn tissues removed, intestines cleaned with *Lig. cresolis* and peroxide of hydrogen, and returned in the abdomen. The wound was closed with Japanese silk and bandage applied over. The cat tore it up a few days after, but the sutures remained intact. The second wound suppurated some. The cat did well except that he had a little constipation, which was relieved with calomel.—(*Vet. Record.*)

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## FRENCH REVIEW.

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

TWO CASES OF SUPERFICIAL RUPTURE OF THE SPLEEN—DEATH IN TWO AND THREE DAYS [*M. Bonnigal*].—Two observations similar in cause and lesion, which differ only in the fact that in one the lesion occurred in the internal and in the other on the external face of the spleen.

In one the animal was placed next to another without separation; he was found one morning with marks of kicks on the legs, but none on the body. For two days he was out of sorts and refused all food. In the morning of the third day he was found dead in his stall. The post mortem shows the tissues pale and bloodless. The peritoneal cavity was full of blood, and on the internal face of the spleen there was a linear laceration measuring 20 centimetres in length.

The second horse was also in a stable alongside another without separation. Kicks were exchanged. This horse was put to work, performed it well, but ate poorly. In the middle of the night he becomes very restless, drops and dies. Post mortem reveals similar conditions as in the first case, but the rupture of the spleen is on the external face of the organ and runs in a transversal direction.—(*Presse Veterin.*)

ISCHEMIC GANGRENE OF THE INTESTINE IN A HORSE [*Mr. Puel, 4th year student*].—This animal had a fall while in harness; he slipped with his left foreleg carried in extreme abduction. He rises and is taken to his stall. The second day after he has violent colics which, treated, are somewhat relieved, but yet not entirely, as for two days longer he has slight pains and cold sweats. The fifth day after his fall he dies. Autopsy: Removing the left foreleg, abundant collection of dark blood is found under the pectoral and olecranon muscles. Opening the abdomen, the intestine is exposed with slightly red color and is distended with gases. The mesenteric artery is thick and hard. A short distance from the cæcum there is a mass of intestine 45 centimeters long, white, anæmic, and bound at its extremities by a hæmorrhagic ring. On a level with this gangrenous portion the serous coat is adherent to the omentum. There is no other lesion of the intestine, nor on the parietal peritoneum or omentum. Cutting the intestine open, all the characters of this ischemic gangrene are found and the separating fixture of the dead organ is well marked. There were also lesions in the stomach, liver, pleura, pericardium and myocardium, manifestations of the toxemia cause of death, resulting from the auto-intoxication produced by the gangrene.—(*Revue Veterin.*)

TREATMENT OF PARANXYSTIC HÆMOGLOBINEMIA BY SUBCUTANEOUS INJECTIONS OF AIR [*Mr. Brunschwig*].—Presuming of the similarity which is claimed by some as existing between

this disease and parturient apoplexy, the author has attempted a form of treatment which has proved in his hands successful in four bad cases. The animals seriously affected and unable to rise and stand up, were relieved in a few hours and recovered very rapidly. The treatment consisted in injecting under the skin of the neck, chest and shoulder a sufficient quantity of air so as to obtain a certain amount of insufflation to distend the skin as far as resonance with percussion. The air is pushed first over an antiseptic fluid and filtrated with wadding. The antiseptic fluid is made of spirits of turpentine, 4 parts; spirit of thymus, 2 parts; creosote, iodoformed ether, thymol, camphor, of each, 2 parts. The skin being open and the insufflation made, say, with a bicycle pump, the gaseous tumor is seen spreading. No reaction follows and the operation seems painless. The author has treated several cases of hæmoglobinemia by this method and obtained excellent results.—(*Journ. de Zootechnic.*)

VAGINAL BANDS IN BREEDING COWS [*Mr. E. Chapellier*].—These are not infrequently observed and, on account of their situation, are considered as the remains of the hymen membrane. Generally they do not interfere with parturition, but sometimes they do. In this present case the band represented a true fleshy column, occupying the middle of the vagina and preventing the expulsion of the placenta. A cow had delivered without difficulty a living calf, and was making unsuccessful efforts to throw off the placenta. It is hanging from the vulva and is kept held in the vagina. In one of the expulsive efforts of the cow, this organ prolapsed and thus, in its middle, was observed a long, reddish cord, round, in which the placenta was held by a loop. The knot was undone, the placenta removed and the cow relieved of her pains. Two weeks later, the vaginal band being relaxed to its normal size was found quite thick and flattened. It was attached to the mucus on the floor back of the urinary miatus and above on the roof of the vagina. It was removed with the ecraseur, cutting it at both ends.—(*Rec. de Med. Vet.*)

### ITALIAN REVIEW.

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

THE WHITE SPOTTED CALVES KIDNEYS [*Dr. P. A. Pesce*].—The author passes a review of the various works and theories that have been advanced on the subject. Those of Vaerts, Guille-

beau, Ostertag, Kitt, Rieck and others are concisely examined, and finally Pesce arrives at the following conclusions:

1. White-spotted kidneys of calves are undoubtedly of inflammatory nature. They consist in a parenchymatous and interstitial nephritis, with, however, a proliferation of the connective tissue, particularly during the later development of the disease.

2. The lesions do not disappear entirely with age, remain in adult life, undergoing changes which alter their aspect.

3. The theories of Vaert and Guillebeau are without foundation.

4. The primary cause of the disease can be attributed only to the action of micro-organisms, although no germ can longer be detected during the stage where those lesions are developed.

5. According to all probabilities, the lesions ought to be considered as an advanced stage of purulent nephritis and as a period of that disease.

6. To the point of view of alimentary hygiene, the importance of the disease remains limited to the kidneys, and these organs alone ought to be kept away from general consumption, and although no accident might follow their use, it would be a prudent measure to have them seized by the meat inspector.—(*Clinica Veter.*)

A CASE OF DIABETÈS IN A STEER [*Dr. P. Bimbi*].—Five-year-old steer is dull since some time and works with difficulty, getting tired easily. He has lost considerable flesh and moves with difficulty. The skin is dry and the coat staring. Temperature and pulse are normal. The animal drinks well and takes large quantities of liquid. He also urinates frequently and abundantly. Examination with the ophthalmoscope reveals slight opacity of the crystalline lenses, and when the animal is left alone when he walks he knocks himself against surrounding objects. Suspecting diabetes, the urine was examined and quite a large quantity of sugar was detected. Some days after the steer died in a comatous condition. At the autopsy there was found great atrophy of the pancreas, which was reduced to the condition of a small, fibrous mass.—(*Il. Mod. Zootia.*)

PILOCARPINE AND ESERINE IN ORSTRUCTION OF THE THIRD STOMACH AND TYMPANITIS OF CATTLE [*Dr. Giovanni Floris*].—This is the record of four cases among a number of other similar ones where the author resorted to the subcutaneous injection of

a solution of muriate of pilocarpine and sulphate of eserine. The condition of the animals was about the same in all; dull appearance, obstinate constipation, marked tympanitis, negative rectal exploration, normal temperature, etc. The constipation had been treated by rectal injection and soap-water drenches. The subcutaneous injection was followed with its ordinary effects and satisfactory results of abundant defecation shortly after its administration. The general condition of the animals was improved shortly after. The author insists upon the great benefit he had obtained and recommends the same in all cases accompanied with tympanitis and constipation, which in fact he says are of daily occurrence in cattle practice.—(*Il. Nuovo Ercole.*)

CASE OF DIABETES MELLITUS IN A PREGNANT BITCH [*Dr. Giuseppe Carlo Sparapani*].—A slut of seven years, pluripara, although eating plenty, has been losing flesh since four months. It is noticed almost day by day that she is getting thinner. She has great thirst, drinks in great quantity, urinates abundantly, and has progressive cataract of both crystalline lenses. She has had an attack of convulsions followed by coma, the day before the writer saw her. Her conjunctive membranes are rosy, pulse regular, respiration normal, temperature 38.8°. The border of the liver is readily felt two fingers' width below the last rib. The urine is examined; it is pale yellow, slightly cloudy, acid, with a density of 1039, evident reaction of acetone, traces of albumin, diabetic sugar 23.8 per 1000. Treatment, fleshy diet and small dose of alcoholic tincture of valerian. Three days later she was delivered of a dead pup which had no sugar in his urine.

This case is very interesting, as similar ones are very rare, at least very few are found in veterinary records.—(*Il. Nuovo Ercolain.*)

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### GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D., Troy, N. Y.

REPORTS FROM PRACTITIONERS [*District Veterinarian, Dr. Ott, Untherthingan*].—Fracture of the point of the lateral distal phalanx was cured by Dr. Ott through an operation, the part being afterward well bandaged, the latter being kept constantly saturated with Liegol's solution. Complete recovery resulted in about three weeks.

As a result of a nail puncture which penetrated the bone of the foot, the cow was unable to bear weight on the affected member. As the usual methods of treatment failed to effect a cure, Dr. Ott amputated the claw. Full recovery took place in about four weeks.

After recovering from colic due to overloading of the stomach, a milch cow suddenly showed symptoms of cerebral disturbance (stupidity and sometimes an expression of anxiety), turning towards the left. The head bent over in the same direction, swaying of the hindquarters. Treatment: Ice bags, chloral hydrate, rectal injections and ruminatorid alleviated in a few hours the Coernurius invasion-like symptoms.

For local anæsthesia, Dr. Ott recommends 3 per cent. alypin. In operations he adds one drop of paranephrin to every 2 c.cm. of the alypin solution.

In otitis externa good results were obtained by using 2 per cent. solution of nitrate of silver and afterwards dusting with dymal.

Painful inflammations of the udder are readily relieved by infusions of 250 gms. of 0.5 per cent. lukewarm solution of therapogen.—(*Münchener Tierärztliche Wochenschrift*, 1910, No. 11.)

THE TREATMENT OF METACARPAL EXOSTOSES [*Josef Löbl*].—The frequency of metacarpal splints occurring in the horse, their various locations—for instance, intermetacarpal, postmetacarpal, and so on—likewise their complications which frequently accompany them—pericarpitis, ankylosis, and so on—justify the efforts to cure the disease rapidly and effectively in order to render the horse serviceable in the briefest period of time. In all cases attention should first be directed to the correction of irregularities in the hoof, in order that the weight of the body may be uniformly distributed upon it.

In the case of lameness, the horse must be given rest, Priesnitz poultices must be applied, and the hydro-thermo regulator can be used with advantage. Also massage gives good results. Further, the various blistering ointments, such as Mellville's ossolin; Tempels and Bayer recommend the cantharadin ointment (1 to 4) and the ointment of the red iodide of mercury (1 to 6). Hoffman applies an ointment of iodine and mercury. Gibson, Mayall, Knauer, Plösz, removed exostoses in an operative way; the author has also been successful in removing splints through

operation. In other cases he obtained excellent results with Klein's antiperiostin. In one case in particular where the splint measured 4 cm. in length, 3 cm. in width and projecting outward 2.5 cm., the part was well rubbed with antiperiostin for ten minutes; the growth disappeared in four days; the scab loosened and fell away at the end of six weeks; the horse was laid up for four days only. In another case, where the splint on the metacarpus attained a size of 5 cm. in length, 2 cm. in width, and 2 cm. in thickness, to which the remedy antiperiostin was applied, at the end of the fifth week the splint disappeared. In this case the part was severely rubbed which resulted in a gangrene of the skin. However, the part healed over completely in about three weeks.—(*Allatourosi Lapok*, 1911, No. 7.)

CONCERNING PALPATION OF THE EYEBALL WITH THE INDEX FINGER FOR THE DIAGNOSIS OF MOON BLINDNESS [*Military Veterinarians, Junot and Roger*].—The authors have found that in horses affected with moon blindness a peculiar reaction is apparent when the index finger is introduced between the orbit and the eyeball over the iris, then bending the first joint of this finger toward the next joint, slowly and gradually exerting a pressure upon the eyeball. As soon as this pressure is felt by the horse, he reacts immediately if moon blind; he moves his head suddenly and violently away from the observer to avoid the pressure, just as if the eye was being treated by faradization. The symptoms are explained thus: The pain is produced by pressure upon the inflamed choroid and iris, and this is evident in all moon-blind diseased horses even when slight pressure is brought to bear upon the eyeball. The reaction just described is not to be confounded with similar movements of the head when pressure is exerted at the same point suddenly and violently without warning to the horse. In the case of nervous and excitable animals patience and command of temper must be exercised. The authors have made investigations on 300 horses, and from these they conclude as follows: First, the horse which does not react to pressure on the eyeball over the iris is not affected with moon blindness. Second, the horse which reacts with a sudden, violent movement, as if he were struck by an electric discharge, is suspicious as suffering from moon blindness, although on examination of the eye no lesions such as keratitis, conjunctivitis, or injuries to the organ are perceptible.—(*Berliner Tierärztliche Wochenschrift*, No. 14, 1911.)

PERHYDROL OF ZINC AND ITS APPLICATION IN THE TREATMENT OF WOUNDS [Dr. E. Hansschmidt].—Zinc perhydrol has in combination the disinfecting power of the perhydrols with the astringent properties of the zinc oxides. The remedy is applied in the form of an ointment in the treatment of *ulcus cruris* with success, in scalds and burns from explosions, in infected and non-infected wounds. In slight wounds a 10 per cent. ointment is sufficient in strength; in severe wounds a 20 per cent. ointment is recommended. It is superior to all other antiseptics. Fresh applications of the ointment are necessary every third or fourth day. Apart from the disinfecting action of this agent, it has an anæsthetic and a hæmostatic effect.—(*Fortschritte der Medizin*, 29 Jahrg., 1911, Seite 36.)

CONCERNING THE BEST METHODS OF RENDERING THE UDDER OF THE COW GERM-FREE AND ITS INFLUENCE UPON BACTERIA AND ON THE IMPURITIES IN THE MILK [Karl Volmer].—The author determined the bacterial contents and in some cases also the filth contents of milk after the udder and right flank of the cow had been treated by various methods before milking. The procedure was as follows: Dry wiping, moist wiping, moist wiping and greasing, dry bran, dry bran and greasing, washing with soap and water, washing and greasing, dry wiping and greasing, moist bran, wiping with oil, washing with a 1 per cent. soda solution, with a 2 per cent. soda solution, wiping with a 2 per cent. soda solution and then oiling. A milk scant in bacteria and almost free of filth may be obtained by wiping the udder and flank with a 2 per cent. soda solution followed with an application of oil. In order to obtain from the udder milk free from bacteria and filth, the methods just enumerated are not effective for the purpose.—(*B. T. W.*, No. 27, 1911.)

Dr. R. C. Longfellow (M.D.), of the Toledo Clinical Laboratories says: "Enclosed find my subscription for 1912, and it gives me pleasure to say that the AMERICAN VETERINARY REVIEW is one of my constant helpers in my work for the veterinary profession.

I find in the REVIEW articles of interest and help in other lines which have a bearing on human matters and profitable to me in my general laboratory service to all the professions. My greetings and kindest wishes for the REVIEW for 1912, its continued benefit to 'both man and beast.' "

## BIBLIOGRAPHY.

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### A MANUAL OF PATHOLOGY.

SECOND REVISED EDITION.

- A MANUAL OF PATHOLOGY. By Guthrie McConnell, M.D., Professor of Pathology and Bacteriology, Temple University, Medical Department, Philadelphia. Second Revised Edition. 12mo of 531 pages, illustrated. Philadelphia and London. W. B. Saunders Company, 1911. Flexible leather, \$2.50 net.

The author claims his work to be only a manual, not to supplant the larger and more complete text book. Careful reading of its pages indicates it to be just what the author intends the work to be: neat, small volume, flexible covers; can be placed in the pocket.

Dr. McConnell has given the student, the busy practitioner, a working and consulting manual of pathology, covering the essentials, the important matters dealt with only, in a clear, easily understood and terse language, that of the teacher.

The chapters on tumors, well described, are freely illustrated from various authentic works, which will greatly aid the student and practitioner in his microscopic diagnosis.

The chapters on immunity, blood, are short, possibly too limited in the everyday investigations, and should have mentioned Jenner's stain, as it is so universally used in all schools of medicine and clinical laboratories.

It seems to the reviewer, that in the present-day blood and serum diagnoses, complement fixation technics, that a mention of the Wassermann technic and modifications should have been given, as it leaves the reader at a loss for these now very important technics.

The chapters on bacteriology, media making, are good and up-to-date, with the exception of specific directions as to correcting reactions by more sensitive indicators, and lacking in the mention of the more modern differential medias for typhoid and colon search.

Few errors have accidentally crept in, possibly during the reading of the proofs, among which, on page 236, mention is

made: "Celloidin has the advantage of not requiring heat, and can be used for larger pieces of tissue. \* \* \* Paraffin can be used for small pieces of tissue only." In fact the reverse is true, for in very small bits of tissue, like uterine scrapings, where an assembled number may only be size of a wheat grain, celloidin is the only method to use, as the melting out of the paraffin would loosen and render useless the fragments for staining.

One statement made on page 253, "The agar will melt at 42° C.," is a mistake, as it will remain melted at that temperature, but requires a much higher temperature to melt it from a solid state. There is, however, so much good matter in this little manual that the few shortcomings, errors, do not detract from its worth to the student or busy practitioner.

The chapters on special pathology are well written, the lesions fully described, and clear illustration of the subjects.

The clear type, excellent paper stock used, binding excellent, leaves nothing to be wished for by the reader, and the publishers are to be congratulated on their work and with the very easy, full index, makes it a very useful, as well as desirable manual, and should be in the working library of every pathological student and worker.

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THE AUTO AND CARRIAGE FACTORY.—The increasing demand for buggies, carriages and all kinds of vehicles with the growth and development of the automobiles and mechanical traction has surprised everybody.

True, "the auto helps the horse," but the demand for good horses is greater than the supply and prices the highest in all the world.

After canvassing the leading manufacturers of horse-drawn vehicles, the New York Carriage Dealers' Journal ventures the prediction that sales of carriages and wagons will increase 100 per cent. in the next ten years. The great Studebaker concern alone will turn out this year about 100,000 horse-drawn vehicles, according to the present outlook, and several others are close on the heels of the famous South Bend builders. One manufacturer in New York state says he can not see that the builders of motor cars are in any real competition with him, so prosperous is his business. Another says his full force is working twelve hours a day, and another reports the best demand in years for light carriages. *Live Stock Journal*.

## ARMY VETERINARY DEPARTMENT.

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In the belief that they will serve as a stimulation to the many veterinary organizations—state, city or other local associations—there are published below the resolutions passed by the Illinois and Georgia Associations in December. Dr. Peter F. Bahnsen, State Veterinarian of Georgia, writes from his office in the capitol, Atlanta, that, in accordance with the resolutions passed by their State Association, a letter, enclosed in which is a copy of the resolutions, has been sent to each Senator and Representative to Congress from Georgia, calling upon them to support the passage of the bill "to consolidate the Veterinary Service, U. S. Army, and to increase its efficiency." The Illinois State Veterinary Medical Association passed favorable resolutions and instructed its secretary, Dr. Louis A. Merillat, who has a brother a retired captain of the regular army and whose son is in West Point preparing to become an officer of the army, to do much work in the propaganda for the passage of the bill. These resolutions and the action of the associations, it is hoped, will serve as an object lesson to all other veterinary organizations to do likewise. Unswerving loyalty to this great cause must take on an absolutely practical form. The Senators and Representatives to Congress must be written to and be shown the necessity for, the justice of and the demand for the passage of the bill. They will listen to and heed the dictates of those whose support they need in order to hold office. Hundreds, nay, perhaps thousands of letters of this character addressed to them by their constituents will be read and become effective. What Illinois and Georgia have done can be done by all the State associations if they profit by example. There is nothing like the contagion of enthusiasm. The representatives of the profession in the army are grateful for what Illinois and Georgia have done and are sure that all other state and local associations will make common cause in the interests of the bill.

D. A. H.

RESOLUTIONS PASSED BY THE ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION AT ITS 27TH ANNUAL MEETING IN CHICAGO, DECEMBER 7, 1911.

Resolved, That we, the members of the Illinois State Veterinary Medical Association, assembled in our Twenty-seventh Annual Convention in Chicago, this seventh day of December, 1911, do express our deep sympathy with the movement to secure commissions for veterinarians in the United States Army, and pledge ourselves, individually and collectively, to support the plan to secure such commissions for our brothers of the Veterinary Profession in the Cavalry and Artillery Corps the Subsistence and Quartermasters' Departments, United States Army, by means of a bill to be enacted by Congress in its present session.

Be it further Resolved, That the Secretary be instructed to make it his duty: (1) To present a copy of these resolutions to each veterinary journal in the United States for publication; (2) to send a copy of these resolutions to each State, city or other local veterinary association in the United States, inviting them to co-operate in the movement mentioned; (3) to send a copy of these resolutions and a letter to each Senator and Representative to Congress from the State of Illinois, inviting his support of the bill to commission veterinarians in the United States Army; (4) inasmuch as only a proportion of our total membership are present at this meeting, that the secretary be instructed to send a copy of these resolutions to each member on the roster of the Illinois State Veterinary Medical Association, together with a letter or other literature, explaining fully the necessity for commissioning veterinarians in the United States Army and the gross injustice being done to the veterinary profession therein.

RESOLUTION ADOPTED AT THE FIFTH REGULAR ANNUAL MEETING OF THE GEORGIA STATE VETERINARY ASSOCIATION ON DECEMBER THE 21ST AND 22D, 1911.

*"To the Honorable Senators and Representatives of the State of Georgia in Congress of the United States, Greeting:*

"Whereas, the veterinary profession has been officially recognized by the United States Department of Agriculture and by the various states; and,

" Whereas, The United States Department of Agriculture has stipulated certain requirements which the veterinary educational institutions must demand of matriculants in order to gain the recognition of said department; and,

" Whereas, The veterinary educational institutions have complied with said requirements; and,

" Whereas, The veterinarians now in the service of the U. S. Army are graduates of said recognized institutions, and are deserving of recognition by the War Department as professional men; and,

" Whereas, The United States is the only civilized country which does not grant such recognition to its army veterinarians; therefore,

" Be it Resolved, That the Georgia State Veterinary Association, in convention assembled, do hereby request your favorable consideration of a bill for the relief of said U. S. Army veterinarians, entitled, ' A Bill to consolidate the Veterinary Service, United States Army, and to increase its efficiency.' "

(Offered by the Committee on Resolutions.)

Unanimously adopted as read.

PETER F. BAHNSEN, *Secretary.*

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#### ARMY NOTES.

Dr. Charles W. Johnson, veterinary inspector in charge, Subsistence Department, United States Army, died in Washington December 29, 1911, in the fifty-seventh year of his age, and was buried in Elburn, Ill., January 1, 1912. Dr. Johnson, a graduate of the Chicago Veterinary College in the early '80s, was in the institution in the days when Dr. A. D. Melvin was a student. He served the Government as a veterinary inspector for nearly twenty years, having been for nearly ten years an inspector for the Bureau of Animal Industry in Omaha and Chicago. When the army was reorganized after the Spanish-American War, as a result of the embalmed beef scandal, it was decided to employ veterinary inspectors to prevent the recurrence of such scandals, and Dr. Johnson was the first appointee. He was transferred from the Bureau of Animal Industry for the purpose and took the oath of office July 9, 1901. From that time until his death he was expert for the Subsistence Department of the Army in

Chicago. He was well known for his astuteness, his high sense of duty and the rigor with which he carried on his inspection work. He was held in highest esteem by the Commissary General and all officers of the Department who came in touch with him.

His sad end illustrates well the wisdom of the bill for the consolidation of the Veterinary Service, United States Army. Last March Dr. Johnson was ordered to the maneuver camp, San Antonio, Texas, when the army moved towards the Mexican border. In bad health when he departed, he came worse when he arrived. Soon he was placed in the maneuver camp hospital. His case was diagnosed as dementia, and he was ordered to the Army Hospital for the Insane, St. Elizabeth's, Washington. There he remained until his death. His expenses in the hospital were paid for by the Government. But as he was merely a civilian he had no protective rights, nor right of retirement for disability incident to army duty. After two months in the hospital his pay was stopped—a hardship upon his family. Seven or eight months in the hospital under such circumstances cannot be reckoned as a gain, nor contemplated except with a feeling of shame that the War Department could not assure protective rights in so serious an emergency. Dr. Johnson's case towards the close was diagnosed as tuberculosis, probably with cerebro-meningeal tuberculosis, causing insanity. Secondly he was afflicted, according to the army medical officers, with pernicious anemia and arterio-sclerosis.

D. A. H.

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The bill "to consolidate the veterinary service, U. S. Army, and to increase its efficiency," has been introduced into the House of Representatives by Mr. Difenderfer, and is known as H. 16843.

The War Department has ordered Dr. Daniel Le May, 4th Field Artillery, and Dr. Walter Fraser, 13th Cavalry, to proceed to Indianapolis, Ind., for the purpose of attending the annual meeting of the American Veterinary Medical Association, August 26 to 29, 1912.

The following veterinarians have recently been appointed to the Cavalry and Field Artillery:

Ralph H. Buffington, Cornell University, 1905, formerly State Veterinarian of Florida, to the 4th Cavalry.

George H. Koon, College of Vet. Med., George Washington University, 1911, to the 10th Cavalry.

Daniel B. Leininger, Kansas City Vet. College, 1906, from the Bureau of Animal Industry to the 12th Cavalry.

James R. Haynes, Kansas City Vet. College, 1909, to the 5th Cavalry.

Richard H. Power, reappointed, former services January 29, 1902, to August 10, 1910, to the 9th Cavalry.

These appointments fill the vacancies in the Army veterinary service. O. S.

The organization of the Canadian Army Veterinary Service was approved November, 1910, and consists of three branches: The Canadian Permanent Army Veterinary Corps, the Canadian Army Veterinary Corps and the Regimental Veterinary Service.

The Canadian Permanent Army Veterinary Corps shall consist of veterinary officers gazetted to the corps and of non-commissioned officers and privates enlisted therein. The names of the officers so gazetted shall be arranged on a regimental list of officers of the C. P. A. V. C. in order of seniority.

DETACHMENTS.—C. P. A. V. C.—Officers, N. C. O.s. and men of the C. P. A. V. C. will be detailed by the officer administering C. A. V. S. to form detachments for duty as required in commands and independent districts.

The Canadian Army Veterinary Corps shall consist of veterinary officers gazetted to the C. A. V. Corps. Their names shall be arranged on a regimental list of officers of the C. A. V. C. and they will be detailed for duty with mounted corps of the active militia as required for a period not exceeding four years. When it is considered advisable, this term may be extended.

REGIMENTAL VETERINARY SERVICE.—This branch consists of the veterinary officers at present on the regimental staff of mounted corps. No veterinary officers shall, in future, be so appointed. The number of the personnel of both the C. P. A. V. C. and of the C. A. V. C. shall be as laid down in the establishment list annually approved by the Governor-in-Council.

RANK, PAY AND PRECEDENCE.—Officers will be entitled to rank and precedence, and subject to the provisions of the pay and allowance regulations, other advantages attached to corresponding rank of combatant officers, but such rank or position will not entitle the holder of it to the presidency of courts-martial, other than regimental, nor will they exercise any military command outside the C. P. A. V. C. or C. A. V. C. except over such officers or soldiers as may be attached thereto for duty.

## CORRESPONDENCE.

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CHICAGO, January 11, 1912.

Editor AMERICAN VETERINARY REVIEW, NEW YORK CITY:

I have just finished reading the January number of the AMERICAN VETERINARY REVIEW, more especially that part which has to do with the new *Army Veterinary Bill*. My heart is full and my joy overflowing on account of the Titanic energy that you have thrown into this movement, which, as you say, is for the good of the *Army Veterinary Service*, but also of endless good to the *veterinary profession of the whole American continent*. Time will show that what you said in your editorial in the January REVIEW is true; that such a reform will be uplifting beyond any recognition on the part of the veterinarians living at the present, to the profession as it will be in the future. We men who are now living should be optimists and utilitarians, and should therefore have in mind the fact that conditions to-day are as nothing; that we should work for the enlargement of the veterinary horizon, for the improvement of the veterinary profession which will grow in power, in effectiveness, in influence, as time goes on; provided we who are now living and work in it can be united in such a manner as will enable us to combine our energies to bring about this better future. Hence, my good Editor, I may say, in all sincerity, that I am proud of you and still more proud, if possible, of what you have done for the Army Veterinary Service in your high-minded editorial in the January number of the AMERICAN VETERINARY REVIEW, and in the care in your arrangement that you showed in the printing of the matter in that number found under the "Army Veterinary Department."

A happy New Year to you. Wouldn't it be fine, if, before the coming of the fiftieth anniversary of the American Veterinary Medical Association, to be held in New York City in 1913, we find that we have founded in the army a veterinary corps which has within itself the means for its own development and for a lasting good to the profession? This can be done if the numerous strong-minded men in the profession, like yourself,

add might to might, double and redouble energies until this bill becomes a law.

With my best compliments, cordially yours,

D. ARTHUR HUGHES.

CLEVELAND, O., January 7, 1912.

*Editors AMERICAN VETERINARY REVIEW:*

The Veterinary Section, Cleveland Academy of Medicine, held its first meeting of the year on January 5 and elected the following set of officers:

Dr. Wm. Redhead, president-elect.

Dr. James Considine, secretary.

Dr. A. S. Cooley, counselor of the section to the academy.

This section has held monthly meetings during the year except summer months. Instructive papers by members have been read and cases of interest reported.

Members of this section always have the opportunity of attending lectures given by the academy in its various sections. The academy proper makes up a course and has men of note from various parts of the country deliver lectures or talks upon subjects of interest.

Our section has planned to assist the state organization in the prosecution of illegal practitioners. We hope to do some effectual work along this line. It is time that something was done. Our state has spent thousands of dollars in the equipment of a veterinary department of the university to educate and make efficient men for the profession, and yet our legislature will amend laws to let the quacks in or neglect to enact laws to keep them from practicing in competition with the young men the state educates. We secured the approval of the academy and their assistance can be asked for in this work.

As one of the state board of censors I think I can say that we are getting well organized in this state to do effectual work. One year ago, while our state meeting was in session, we suddenly learned that our law (which we thought good, and the quacks feared) was about to be amended to favor the illegal and uneducated man to get in practice. We threw our influence against the amendment with the good services of Louis P. Cook, and prevented the adoption of them; for there was one in the Senate and another in the House offered.

The association officers met with the censors and formulated plans to work on. Our first work was to organize a committee of eighty-eight, one from each county in the state, to work with us, keep us posted on anything coming up of interest to the profession. We were careful to pick good, live men, of good character and influence, to work on this committee. At the same time to give us names of places likely to be good places to locate qualified men.

Our next work now will be to start prosecution of several in different parts of the state and try out the law. This will be up to the state association. We hope to instill into the organization a life of work, hard work for the betterment of the profession, becoming an influential factor in the work in our state, co-operating with the committees of the A. V. M. A. in their work of a national character.

(Signed) A. S. COOLEY.

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NASHVILLE, TENN., November 27, 1911.

C. BISCHOFF & Co., NEW YORK :\*

GENTLEMEN—As per your request, I am sending you report of 2,023 dairy cows, tested with the *Intracutaneous Test*. As this is the third year our dairies have been tested, the percentage of reactions was small. There were 5,126 cows tested here this year, of which we tested 2,023 with the intracutaneous test; of these 2,023 animals tested, 28 reacted and were slaughtered, 25 showing tubercular lesions. The other veterinarians tested 3,103 and found six reactors; these 3,103 were very nearly all tested with the subcutaneous test. Every one of our 28 reactors was retested and, without a single exception, they reacted to the second test, showing enlargements just about the same size on both sides of the neck. It was very noticeable that in herds where we had never found any diseased cows in the two former tests, not a trace on a single animal was shown; but every time we injected a herd where we had found diseased animals before, from one to ten would react. The intracutaneous test showed 14 reactors per 1,000, while the subcutaneous test showed 2 reactors per 1,000.

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\* A copy of a letter addressed to C. Bischoff & Co., from a patron, published at the former's suggestion, that the profession in general might benefit by Dr. Bell's experience as presented to them.

If the tuberculin test is made for the purpose of ridding the herds of tuberculosis, there is no doubt that the intracutaneous test is by far the best, as it will react on many slight as well as advanced cases in which the subcutaneous test will not; besides, it is much more humane and does not inconvenience the dairyman. When a herd is tested by the subcutaneous test in spring or summer, the cows will go off a large per cent. in their milk, which is positive proof that they have undergone a hardship and one far-reaching in its effects: the cow suffers, the dairyman loses milk and subsequently money, while his customers are short of milk. The subcutaneous test was all right when we had none better, but it is a back number to-day when we have a method so far superior. Again, the subcutaneous test is unsanitary and liable to spread disease where the temperature of a large herd is taken repeatedly and the custom followed of attaching strings to the thermometers and clamping them to the tail, in which case the thermometer will easily become contaminated with contagious abortion and, hanging over the vulva, is liable to spread the disease through the herd, thus doing inestimable damage. With the intracutaneous method there are none of these objectionable qualities:

It is clean; the subcutaneous test is not.

It is safe; the subcutaneous test is not.

It is reliable under all conditions; the subcutaneous test is not.

It cannot be plugged against; the subcutaneous test can.

It shows the stage of disease; the subcutaneous test does not.

It does not set the cattle back in milk; the subcutaneous test does.

It causes no rise in temperature of reacting cows; the subcutaneous test does.

It saves people from using milk from cows that are giving a constitutional reaction at the time they are milked and before they are condemned. The milk from a tuberculous cow that has been thrown into a state of fever from a constitutional dose of tuberculin, is many times more virulent than it had ever been before; yet people use this milk, for it is milked after the tuberculin was injected and before the cow was condemned, and while the virulence was at its highest point more damage could probably be done with one spoonful of milk taken at this time than such a cow's milk could probably do in several years under her physiological and yet pathological condition. All this danger is avoided by the intracutaneous test, as it reacts only locally.

I cannot see where the old subcutaneous tuberculin test has a foot to stand on in the presence of the later developments of the intracutaneous test, which has not one objectionable feature. It has been condemned by some, but those who condemn it never used it, and will not under the hardest pressure say why they condemn it and wherein it is weak.

Yours respectfully,

(Signed) WM. M. BELL, M.D., D.V.S.

QUALIFICATIONS (continued from page 632).—After five years' service in that rank, *Veterinary Lieutenants* may, if recommended by the P. V. O. of the command or independent district, and after successfully passing the examinations laid down in the regulations for the Canadian Army Veterinary Services, be promoted to the rank of *Veterinary Captain*, and *Veterinary Captains*, after ten years' service in that rank, may be promoted to the rank of *Veterinary Major*. *Veterinary Majors*, after five years' service in that rank and who have served consecutively during twenty years as veterinary officers, may be given the rank of *Veterinary Lieutenant-Colonel*. Officers of the Regimental Veterinary Service will be governed by the provisions of paragraphs 17 and 18 as regards promotion. The appointment of these officers will remain as at present, *viz.*, *Veterinary Lieutenant*, *Veterinary Captain* and *Veterinary Major*. The following regulations will be observed in the appointment of qualified candidates to the Canadian Permanent Army Veterinary Corps. The rates of pay and rules regarding promotion and retirement of veterinary officers are laid down in the pay and allowance regulations and in K. R. and O. for the militia. Candidates for admission to the C. P. A. V. C. must make written application to the secretary of the Militia Council. The minimum age of candidates is 21 years, and the maximum 35 years, except in very special cases when the latter limit may be exceeded. Candidates will not be accepted unless, in the opinion of the Minister in Militia Council, they are in all respects suitable to hold commissions in the Canadian Permanent Army Veterinary Corps. Every candidate must be a British subject and a graduate of a recognized veterinary college, and will be required to pass an examination before a board of veterinary officers before being granted a commission. He will be required to forward a certificate of birth or satisfactory proof of age with his application. If his application is approved, he will be required to be certified by an officer of the P. A. M. C. being physically fit.

## SOCIETY MEETINGS

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### KANSAS VETERINARY MEDICAL ASSOCIATION.

The eighth annual meeting of the above association was held at the Veterinary Building of the Kansas State Agricultural College, Manhattan, December 27, 28, 29, 1911.

The president, Dr. W. N. Hobbs, called the meeting to order at 1.30 p. m. As the secretary, Dr. Burton Rogers, was absent, Dr. J. H. Burt was appointed by the president as secretary *pro tem*. A large number responded to the roll call. The minutes of the last meeting were read and approved.

The address of welcome was delivered by Prof. A. Dickens, of Manhattan. Dr. F. W. Caldwell responded.

Thirty-eight applicants were next received into full membership.

At this session the following papers were presented and caused some instructive discussion: "Bacterins, Their Manufacture and Uses," by Dr. L. B. Barber; "Corn Stalk Poisoning," by T. P. Haslam. The brains of some animals that had died of corn stalk poisoning were exhibited.

Adjourned at six o'clock, to meet again for the second session at 7.30.

At the evening session, Supt. J. H. Miller, of the extension department, spoke of the advancement of farming and pointed out how the veterinarians could help the farmer by advocating better stock and the right kind of stock for certain localities.

Owing to the absence of Prof. L. Bushnell, of the bacteriology department, Dr. J. G. Jackley presented a paper on "Bacteria," which was well received. Drs. Kern, Basseler and Groome reported a number of interesting cases which created quite an instructive discussion.

The meeting adjourned at 10 p. m. to meet again December 28, 8 a. m.

The third session began at 8 a. m. Thursday, December 28. Dr. F. S. Schoenleber gave a talk on tuberculosis. Hon. J. H. Mercer, Live Stock Sanitary Commissioner, spoke on the laws

regarding the testing of cattle for tuberculosis and the disposal of the reactors.

At 10 o'clock the meeting adjourned for the members to pay a visit to the anti-hog-cholera serum plant.

At the fourth session, which began at 2 p. m., the election of officers took place. Dr. W. N. Hobbs was re-elected president; Dr. Burns, first vice-president; Dr. Tice, second vice-president; Dr. J. S. Burt was elected secretary-treasurer; Dr. Guilfoil was re-elected as a member of the executive committee until 1915. A motion was carried extending a vote of thanks to the retiring secretary, Dr. Burton Rogers, for the good work he had done.

The Committee on Resolutions were, C. B. Kern, chairman; C. W. Hobbs, H. R. Groome.

The following resolution was accepted:

Whereas, We feel that the veterinarian is an important and necessary part of the army service, and

Whereas, As there is now pending before Congress a bill to better the condition of the veterinarian in the army, be it

Resolved, that the K. V. M. A., now in session, urge the member of the Kansas delegation to Congress to carefully consider this bill and the brief accompanying it, and give it their support on the floor of the House and Senate to the end that it become a law, and

Be it further Resolved, That each member of this association take it upon himself to personally urge the delegates to Congress from his own district to support this bill.

Dr. C. W. McCampbell gave a talk on the stallion registration law, showing how the horse breeder is being protected. Dr. McCampbell showed photographs of certificates of pedigrees which the registry board had found were incorrect.

Meeting adjourned at 6 p. m.

The fifth session met at 8 p. m.

Dr. O. Verschelden presented a paper, "Some Observations on Blind Staggers." This paper caused a good deal of discussion as this disease is quite prevalent in some parts of the state. Dr. E. C. Bates and others reported some interesting cases.

As Dr. Reichenecker was not present to deliver his paper on "Hog Cholera," Dr. F. S. Schoenleber spoke on this subject and urged that results, both favorable and unfavorable, following the use of the serum furnished by the college be reported to the college. The meeting adjourned at 10 p. m.

The sixth and last session met at 8 a. m., December 29. As this session was devoted entirely to clinic, the reading of a number of papers had to be postponed. Dr. W. H. Richards, of Emporia, performed oophorectomy upon some heifers. This operation was very interesting and instructive, as Dr. Richards makes an opening in the flank not larger than to admit the thumb and forefinger, both ovaries to be removed through the opening on one side. As the opening is small, and the leg extended in such a position that the opening through the skin and muscles are not in apposition when the animal is released, no stitches or after-treatment is necessary.

Dr. R. R. Dykstra performed an operation for roaring by removing the mucous membrane of the ventricle beneath the vocal cord. Dr. Dykstra also operated upon a mule and Dr. L. L. Conkey performed oophorectomy on some sows. Unfortunately, a visit to Fort Riley had to be postponed.

The meeting was the best in the history of the association, about 125 members were present.

The meeting adjourned at 12 o'clock, December 29, 1911, to meet at Topeka, January, 1913.

J. H. BURT, Secretary.

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## VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular monthly meeting of this association was called to order by President-elect George H. Berns, of Brooklyn.

The minutes of the December meeting were read and approved.

Dr. Clayton, chairman of the "Smoker" Committee reported that arrangements were about complete for the annual reunion and smoker of this association and urged every member to be present and bring a friend along.

Dr. C. N. Darke, chairman of the Prosecuting Committee for 1911, who was unable to be present at the annual meeting, made his annual report which was duly approved.

Dr. Berns then announced the following appointments for 1912:

Board of Censors—Dr. R. W. Ellis, chairman; Dr. C. E. Clayton, Dr. W. W. Cochran, Dr. Chas. Jamieson, Dr. G. F. Bowers.

Judiciary Committee—Dr. W. Reid Blair, chairman; Dr. E. B. Ackerman, Dr. P. Burns.

Prosecuting Committee—Dr. W. J. McKinney, chairman; Dr. D. W. Mangan, Dr. R. H. Kingston.

Dr. Berns then thanked the association for the honor of his election as president and then gave an interesting address on the "Value of Veterinary Associations."

In this address the doctor brought out the points that veterinary associations promote good feeling and by discussion of different subjects obtain greater proficiency among the members. Also considers it the best post-graduate school for a busy practitioner. They elevate the standing of the profession and enable us to gain recognition, as well as to advance veterinary science.

Dr. Berns also mentioned the fiftieth anniversary of the A. V. M. A., which will be held in New York City in 1913, urging that this association do all in its power to promote the success of this meeting.

Dr. R. W. Ellis then gave an interesting address on "My Impressions of the Chicago Meetings."

The doctor stated that his first impression was that he was attending a second A. V. M. A. meeting in the same year, there being so many veterinarians present. Was also impressed by the diversity of opinions on different questions which arose and the earnest manner in which they were debated.

Tuberculosis in cattle was discussed at great length and the intradermal and ophthalmic tests were demonstrated by Dr. Mohler of the B. A. I. on 140 head of cattle at the stock yards. Dr. Mohler demonstrated the accuracy of these tests by slaughtering the reactors and holding post-mortem examinations.

Dr. Ellis was also strongly impressed by the grand exhibit of cattle at the Fat Stock Show.

Drs. Kingston and Clayton described an interesting case of calculus in a horse's bladder, which had caused difficulty in urinating for a long time.

The doctors decided to operate and with the assistance of Dr. R. W. McCully this was done. It was found to be impossible to crush the stone so the neck of the bladder was dilated, and after a long and tedious manipulation a stone weighing over 12 ounces was removed.

This animal was operated on December 20, 1911, and at present (January 3, 1912) shows every indication of making a complete recovery.

This case report created an interesting and instructive discussion on the subject of calculi.

Dr. Greissman described an interesting case in a horse which he was called upon to attend. On arrival he found the animal down and unconscious, and owner stated he had been down for eight hours. The doctor bled the animal, removing about eight quarts, after which the animal suddenly jumped to his feet. The urine was removed and about two buckets full of feces taken from the rectum, after which the animal again dropped down. He was placed in slings, and the only treatment given was alcohol and water. The animal remained in slings four days, was removed and made a complete recovery.

This case report brought forth several different opinions as to the cause of this condition. It was suggested that it was due to a disturbance of the central nervous system, auto-intoxication, or pressure due to the accumulation of the fecal mass in the lower bowel.

Drs. Percival K. Nichols and Alexander Schlesinger were elected members of the association.

NEW BUSINESS—Under the head of "New Business," Dr. Robert W. Ellis called the attention of the members to the bill to consolidate the veterinary service in the United States Army and to increase its efficiency. The doctor made a strong appeal in behalf of the bill, pointing out the *general* elevating effect upon the entire American veterinary profession that would accrue from the elevation of the veterinarian in the army to the rank merited by his professional attainments, and offered the following resolution which was unanimously adopted by the association: "Be it Resolved, That this, the Veterinary Medical Association of New York City shall go on record as indorsing the work of the Committee on Army Legislation of the American Veterinary Medical Association and as pledging their support to said committee, both as an organization and individually."

Drs. Cochran and Bowers stated that they would contribute papers on some interesting subject for the next meeting.

It was regularly moved, seconded and carried that the March meeting of this association be held at the Berns Veterinary Hospital in Brooklyn.

Dr. Chase spoke of the need of inspection in the outlying districts, as meat of diseased animals is frequently offered for sale. After some discussion it was deemed best to leave this

question to the State Society or the State Department of Agriculture.

A unanimous vote of thanks was extended to the contributors to the program of the evening.

Meeting adjourned.

R. S. MACKELLAR, V. S., Secretary.

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## SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION.

The semi-annual session of the S. V. V. M. A. was held at Reading, Pa., December 20, 1911, and was called to order by President W. S. Longacre, W. G. Huyett recording the minutes.

The following members were present: Drs. W. S. Longacre, E. D. Longacre, G. R. Fetherolf, G. A. Wehr, W. G. Huyett, O. G. Noack, U. S. G. Bieber and D. R. Kohler. Visitors present were: J. J. Kenney, N. Y.; Drs. J. W. Dunkelberger, Bernville; M. D. De Turck, Oley; N. L. Schaeffer, Fleetwood, and others.

The minutes of the previous sessions were read and approved. A number of new members were proposed, the applicants being Drs. J. W. Dunkelberger, M. D. De Turck, N. L. Schaeffer, and R. L. Berger, Shartlesville. The Board of Trustees acting favorably upon these candidates, a motion was made and seconded that they be duly elected as members of this association.

Among the various communications read was one relative to the soliciting towards a fund for the erection of a monument to the late Prof. S. Arloing, a distinguished veterinarian, and who had been for many years connected with the veterinary schools of France. Upon a motion that carried, the association donated five dollars toward this fund.

Delegates to the Pennsylvania, Keystone and American Veterinary Medical Associations, representing this association, reported excellent meetings with good attendance, especially the latter, which was represented by Drs. Huyett, Noack and Fetherolf, whose sessions were held at Toronto. It was brought out that this meeting far surpassed any other session both in attendance and in increasing the membership. There is no reason why every eligible practitioner should not become a member.

Under report of committees, the Committee on Meat and Milk Inspection offered a good report, the subject being quite

fresh in their memories, though in its infancy, by the recent inauguration of dairy farm inspection throughout the state, at the instance of our devoted and energetic State Veterinarian, Dr. C. J. Marshall, and under the auspices of the State Live-Stock Sanitary Board, the most competent practitioners throughout each county taking part in this work in connection with their practice.

Dr. E. D. Longacre presented a paper upon "Rhinitis." Quite a discussion arose in reference to the proper treatment, etc.

The other essayist, Dr. McCarthy, being absent, various other cases were related and considered, but the drift of the discussions were upon dairy inspection, some inspectors relating their experiences, and noting that the inspection will be a success, as many dairymen are improving conditions, and that very little objection is raised by the former against the inspector.

One member suggested that the association decide upon a uniform price in practice in making visits, performing operations, etc., but it was the consensus of opinion that such action would not prove to be a successful procedure.

The society adjourned.

W. G. HUYETT, Secretary.

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#### MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION.

The above association met December 28, 1911, at the A. and M. College, this being the fifth annual meeting of this association. The meeting was called to order by the president, Dr. E. M. Ranck, at 1 p. m., the following veterinarians being present: Drs. E. M. Ranck, John Oliver, B. M. Leigh, T. Butler, B. M. Mills, H. E. Buie, O. M. Norton, J. D. Townsen, W. H. Ewing, J. T. Alson, B. C. Mitchell and Wm. P. Ferguson. After the minutes of the previous meeting were read, committees submitted their annual reports.

The proposed act for legislation and other matters were taken up and discussed; resolutions were prepared and adopted to be presented to the Governor and members of the legislature, urging that an act be passed at the next session of the legislature to create a state board of veterinary medical examiners and require practitioners of veterinary medicine to secure licenses for the practice of their profession.

The following committees were appointed: Executive Committee, Drs. Oliver, Townsen, Buie, Leigh and Davenport. Legislative Committee, Drs. Oliver, Ferguson, Davenport, Norton and Ranck. Printing Committee, Drs. Butler, Norton and Archer.

While the meeting was not largely attended, those who were present worked earnestly for the good of the association. It is expected that the next meeting will excell all others in the way of papers, clinics and memberships.

Officers were elected as follows:

Dr. E. M. Ranck, president.

Dr. O. M. Norton, vice-president.

Dr. W. P. Ferguson, secretary and treasurer.

(Signed) WM. P. FERGUSON, *Secretary*.

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## GEORGIA STATE VETERINARY ASSOCIATION.\*

RESOLUTION ADOPTED BY THE GEORGIA STATE VETERINARY ASSOCIATION IN REGARD TO THE SUPPRESSION OF CERTAIN FORM OF SHIPPING FEVER OR STRANGLES IN HORSES AND MULES.

*"To the State Veterinarian, Greeting:*

"Whereas, Under the present live-stock sanitary laws of the State of Georgia, certain diseases of horses, asses and mules, which have proven a menace to the live-stock interest of the various states, are not included in the classification of infectious and contagious diseases; and,

"Whereas, It is the opinion of the various members of the Georgia State Veterinary Association that certain forms of shipping fever, influenza, stable pneumonia and strangles of horses and mules should be considered as infectious and contagious diseases and the movement of such animals so affected restricted; and,

\*See resolution passed by this association in relation to Army Veterinary Bill in Army Veterinary Department, page 677.

"Whereas, The shipping of such diseased animals invariably results in undue suffering to the affected animal, not infrequently terminating in death, and in the spread of these diseases to other localities, and in financial loss to the owners; therefore,

"Be it Resolved, That this association recommend to the state veterinarians that they promulgate, under the law now in force in the states interested authorizing the control and suppression of infectious and contagious diseases of animals, such rules and regulations as may be necessary for the control and suppression of the above-mentioned diseases; and,

"Be it further Resolved, That a copy of these resolutions be spread upon the minutes of this association, and that copies be forwarded to the veterinary associations and to the live-stock sanitary officers of each state concerned, and to the Bureau of Animal Industry."

(Offered by Drs. Jolly, Burson and Cary.)

Unanimously adopted as read.

PETER F. BAHNSEN, *Secretary.*

A BAFFLING QUESTION.—Our esteemed *confrere*, Dr. William Dougherty, of Baltimore, Md., received the following question while acting in the capacity of veterinary editor to the agricultural department of the Baltimore *Weekly Sun* some years ago. The good doctor finally succeeded in so educating the *Sun* readers that such questions ceased coming in:

"Mr. Editor of the *Sun*:

"I hav a valable cow that dropt me a Calf bout 4 weaks ago, an has never stud alone sense. I saw a cow docter an told him her Simtums an he pernounced her caise holler horn an sed he wood bring his insterments over in the mornin an releave her. the nex mornin he cum with a brase an bitt to boar her horns so as to apply terpentime an pepper, but when he rived he found she was a Buffaler cow an had no horns an sed he wood have to gow home to consult his book on such a complycated caise he left an has not been to see her sense what I desire to no is how to teet a caise of holler horn when the animule has no horns to boar and by so doing you will confeer a grate favor on a constent Reader."

## NEWS AND ITEMS.

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### OPEN LETTER TO GOVERNOR TENER, OF PENNSYLVANIA.

OCTOBER 28, 1911.

JOHN K. TENER, Governor,  
Harrisburg, Pa.:

DEAR SIR—After six months of patient waiting, I have learned by the newspapers' reports that you have finally decided not to reappoint me on the State Board of Veterinary Medical Examiners, undoubtedly because I had declined to act upon the many suggestions, or to accept the advice of numerous parties who waited upon me urging that I invoke the aid of the political bosses for my retention, and who had assured me that there would be no difficulty in retaining my place on the board if I would cease to be so active in my political efforts for better government in our state and city. To all of this I turned a deaf ear, because of my pride for my profession, and the devout hope that this board would not become a political one. More than six years ago my retention on the board was threatened, and I was strongly urged to seek the endorsements of your corrupt ally, the Ryan-Donnelly organization of this city, which I emphatically refused to do, though assured that with their endorsement there would be no difficulty in my retention. The laws which I was by my official place to enforce were intended to guarantee to the people of this commonwealth properly qualified veterinarians, and to see that those who were qualified were protected from quacks, charlatans, impostors and open law breakers.

During my sixteen years' service on this board I plead guilty to many times offending the machine of our state and city, and many of the abject followers of these organizations. In the performance of these duties, it is true I offended the political bosses of Cambria County, who in their daring disregard of law united the Senator, the Representatives for that district and the County Prosecuting Attorney, and through this combination the Grand Jury of that county denied us the right or even an opportunity of prosecuting an open and defiant law breaker, and by placing

the expense on the board, robbed the board of more than one hundred dollars—a tenth of its annual income.

It is equally true that our experience in Allegheny County, where members of the bar, who train with the machine, openly counsel with and aid law breakers and offenders against these laws, and through close relationship with the district attorneys, and the fact that some of these members of the bar never hesitate to fix juries when requisite, made our task practically impossible in ridding Allegheny County of many such offenders.

In prohibition Greene County of this state, an open breaker of these laws twice brought before the court was allowed to go free with a nominal punishment, because of the influence of a conspicuous druggist of that county, through whose store many prescriptions for whiskey were given by this breaker of the laws of veterinary medicine and surgery, which druggist it required more than six years of prosecution to convict for the many offenses he had committed in selling liquor without a license, but who was strong in the counsels of the machine of that county.

I again offended the state machine when I moved to arrest the Republican County Chairman of Monroe County, and whom, you will recall, is your present appointee as Sheriff to fill the unexpired term of a deceased Democratic incumbent, and when I reported the performance of this duty to the president of our board, and of a council of leading representatives of that district with State Chairman Walton to restrain prosecution of this law breaker. Later this letter became a matter of further consideration by the Republican bosses of Bucks County, through our president inadvertently exhibiting this written protest of such condign influences intended to defy the purposes of these laws. Subsequently a council was called in the Betz Building, at which there were several of Philadelphia's bosses, one or two Senators, following which there leaked out threats of my removal, and which later culminated in the Ripper Bill to destroy the value of these laws to the people of this commonwealth, rushed through the House in the late hours of the evening's sessions, and placed in the Senate in the custody of equally corrupt Democrats, who for more than five years, with the aid of the Republican County Chairman, a holder of office under your administration and previous ones, the judge and the district attorneys of Adams County have openly protected this notorious breaker of these laws. A man driven from Maryland as a law breaker, and under bond not to return, and guilty of breaking almost every law for public

peace and good order, thus defeating the purposes of these restraining laws. This, too, in the face of the appeals and protests of many of the good citizens of that county.

I plead guilty of offending the Republican machine of this city and its Democratic ally, in fighting for six years under every obstacle machine government can afford, the Johnson case of this city, another open law breaker, and who continued in the face of his arrest to break the law under the advice of counsel, who felt confident that this board would be compelled to give him a license. Said Johnson was furnished, as a threat, the aid of the organization's attorneys for his defense, and twice received the aid of Judge Martin's court in order to defeat the purposes of these laws. It is true that Judge Staake reversed the decision of Judge Martin: and it is equally true that the Superior Court of our state sustained the points contended for by this board in its interpretation of these laws, as well as the opinion rendered by Judge Staake.

I also arrested twice one of Senator Vare's followers, and through whom he was afforded bail, and who as a law breaker was employed by the Vare Brothers, and the work that he did denied to legitimate and licensed veterinarians in the southern portion of the city.

And once in fair Chester County, the northern terminus of the underground railway of abolition days—now the shame and disgrace of the country for burning a negro at the stake, the outcome of continued failure to punish law breakers protected by the machine and whose prosecuting officials, in the face of the most absolute evidence of guilt, freed through the grand jury a self-confessed law breaker because his conviction on the eve of an election might have injured the machine's hope of victory.

I denied to the present City Veterinarian of Philadelphia, an ex-Democrat, the right to send out a student to practice veterinary medicine contrary to law, to help carry on his practice while he was engaged in rendering city services under salary, and who willingly courted the assistance of the bosses and the "Sunday Morning Leeds Club Conference" to restrain my activity in enforcing these laws without fear or favor.

I dared to arrest Paddy Clark, a McNichol Democrat, a lodging-house keeper in the Tenth Ward, for brutally cutting the foot of a horse, and demanding and exacting \$12 for the same before he attempted this brutal act, that necessitated the killing of the animal to save it from its suffering and its future useless-

ness. That another one of the same ilk, who had urged the negro to pay this money, became the bondsman of this law breaker, and so much political pressure was brought upon the magistrate that he would not allow a charge of "cruelty to animals" to lie against this law breaker; but held him for court as a violator of the veterinary practice laws; where I have no doubt the same obstacles will confront the board in securing his trial and conviction, which have been put forward in every case where we have attempted to enforce these laws, where the offender was a willing adherent of the machine.

I have also offended a number of the abject followers of the machine, members of my profession who have repeatedly refused to comply with the requirements of these laws, some of whom were compelled to comply with the same when prosecutions for so offending were about to be instituted. It is true that you have denied the request and appeal of 98 per cent. of the profession of this state who desired my retention, solely because of my earnest efforts to enforce these laws. I know you are in possession of private communications from abject followers of the machine who charge me with being a Bryan Democrat, to which I plead guilty, and therefore, should hold no office that the machine could control. These same men have plead with Senator Penrose for my removal, and demanded that I be denied any public state work which I was selected to do by the lamented State Veterinarian Pearson, whose sad death was largely contributed to by the demands of the state machine to put into place unfit men; to keep in place salary grabbers, who render no service, and who was forced to keep in position men guilty of gross insubordination and neglect of duty—salary and expense grabbers; and whose successor, the present State Veterinarian, has equally been forced to keep in place, against his will and judgment, one of this number at your personal request or command.

I do not deny that many letters from men high in political place and power throughout the state have only received the same consideration that similar letters from humble citizens, and which were given equal consideration in determining the action of this board, and which gave offense to many clothed with political power when the board could not see its way to grant the favors asked without violating their oath of office.

It is equally true that I have not contributed to the state and city machine the voluntary contributions requested of all who hold places under the state and city administrations, and to you

I especially plead guilty of being one of the Blankenburg Committee for the defeat of John K. Tener for Governor, when I learned of the perfidy that led to the nomination of Senator Grim on the Democratic ticket and of the alliance with the liquor leagues which defeated my colleague, Dr. J. C. McNeil (whom you have also declined to reappoint), for a senatorial nomination in Allegheny County because his platform was an anti-Penrose one; and because he is a supporter of Mayor Magee, whose power and influence you have become a willing tool in destroying. Of course, I recognize I could not expect any better fate at the hands of a man whose public record had to be apologized for during an entire campaign, and who was willing to loan all his influence to smite the downtown leader through whose efforts you know you were elected Governor; because he desired to release himself from the yoke and collar you have shown your willingness to accept and wear as soon as you occupied the chief place in our commonwealth which you hold.

Of course, it is of no concern to those who have no regard for law that you have in one instance appointed one member who is not a licensed practitioner of the state and another who has on several occasions so disregarded these laws that he has for months at a time been an illegal practitioner. These members must now recognize that the machine in its throes of despair wants pliable men, for it is only those they seek to place in public positions.

I might go on and record many other like instances, but it is not necessary.

With no personal feeling or regret, conscious of a faithful performance of my public duty, and loyalty to my true professional colleagues, I sincerely deplore the placing of this board under partisan political control.

Yours in deep humiliation,

W. HORACE HOSKINS.

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Through an oversight we neglected to credit Dr. Reynolds' article on Hog Cholera in our January number to the U. S. Live Stock Sanitary Association meeting, where it was presented December 6, last.

## A LESSON ON CLEAN MILK.

John Mahoney was the father  
 Of the dearest baby girl,  
 And he wept to see it feeble,  
 Worried o'er the household pearl.

John was sad and pondered often,  
 Asked his wife: "Why is this true?  
 "Why should Nellie be so wraithlike  
 "When she should be strong, like you?"

Wife replied: "John, I'm heartbroken;  
 "While I feel entirely sure  
 "Dairy Bill is strictly honest,  
 "Can he sell milk that's not pure?"

"There are times when Nellie sickens,  
 "Can't retain the milk at all,  
 "If she doesn't quickly rally  
 "I must Doctor Curem call.

"Dairy Bill, however honest,  
 "Cannot keep his dairy clean,  
 "For when I've examined bottles  
 "Signs of refuse I have seen.

"Let us try another dairy,  
 "We might gladly be surprised;  
 "Have you heard of Tuttle's dairy  
 "With the bottles sterilized?"

John had read of Tuttle's dairy,  
 Thought him cranky 'bout the thing,  
 But consented that they'd try him  
 Just to see what change would bring.

Lo! wee Nellie smiled serenely,  
 Took her milk and sank to sleep;  
 Roses made her cheeks bloom sweetly,  
 Breathing soft and slow and deep.

Nellie fattened, growing daily;  
 On John's face there grew a smile;  
 Wife performed her duties laughing,  
 There was gladness all the while.

Then said John: "There must be something  
 "In the way the cow is kept;  
 "Even though the cost were greater  
 "I should buy from an adept."

Quoth he: "Yes, results are worth it,  
 "For I've seen my baby grow  
 "From a wailing wee dyspeptic  
 "Into childhood's ruddy glow."

Thus his wife: "Ah, John, my dearie,  
 "We've a lesson learned, I ween;  
 "We shall patronize the dairy  
 "That is absolutely clean."

(M. E. Knowles, at the U. S. Live Stock Sanitary Ass'n., Chicago.)

# AMERICAN VETERINARY REVIEW.

MARCH, 1912.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, January 15, 1912.

A STUDY IN COMPARATIVE PATHOLOGY.—A primitive sarcoma of the right frontal lobe complicated with fatal perineoplastic softening in a horse has been the occasion for a magistral article in the *Recueil de Medecine Veterinaire* by Prof. G. Petit, Dr. Marchand and Major Berton, Army Veterinarians.

“The symptomatology of cerebral tumors in animals is yet so little known that often the diagnosis is undecided and post mortem alone makes it possible to establish the seat and the nature of the lesions. This difficulty of diagnosis has several causes. Compared to the human brain, that of the horse has a relatively simple function. The intellectual symptoms, the signs of localization, the convulsive troubles do not present positive character, or, at best, are these only outlined. The general symptoms of cerebral tumors, so frequent in man, consisting of headaches, easy vomitings, constipation, are not recognized or observed in animals. The brain of the horse is much smaller than that of man, and a malignant tumor may perhaps grow bigger and invade more tissue, more rapidly, hence the exhibition of symptoms indicating rather a diffuse more than a localized lesion.

“ Notwithstanding the general progress made in later years by the clinic of cerebral affections in man, it must be acknowledged that errors of diagnosis are still relatively frequent when one is in the presence of encephalic tumors, and there is nothing surprising for these errors to be more frequent in veterinary medicine. *There exists no grouping of symptoms, no pathognomonic syndromes of cerebral tumors.* The signs that they give rise to are met in the course of other diseases of the brain. There are even cases where the onset, evolution and termination of the disease are such that everything contributes to induce the practitioner in error. The following is an example:

“ A seventeen-year-old artillery horse, good worker, has been generally healthy and given all satisfaction. One morning, being outdoors, *he suddenly drops—collapsed, so to speak—and remains about ten minutes, the legs flexed under the body, the nose resting on the ground, the head firmly flexed, the neck curved and the seat of strong, severe spasmodic contractions.* He got up abruptly, standing stiff with contraction of all the muscles—neck stiff, elevated; tail straight; legs moving all as if in one piece. The body is covered with profuse perspiration. Taken to his stable, and well rubbed, his condition is much improved. The horse is quieter. The respiration and circulation are about normal. The temperature  $38.4^{\circ}$  Conjunctivæ a little congested; pupils reflex is normal; no alteration of the fundus oculi. Appetite is fair. The animal moves slowly, but about normal. Lumbar reflex absent. Pricking with sharp needles for dysesthetic regions are not well marked. This condition lasted for 24 hours. The next morning appear series of paroxysms, which follow each other rapidly. *The animal has unrelaxing, sturdy falls, makes sudden jumps forward or sideways and exhibits general or local contractions.* He assumes most unusual positions; he rears up half way, sustained by a wall, with his feet in the manger, or again with his neck bent to the right and the chin resting on the shoulder. Keeping these peculiar attitudes during the day, towards evening he drops once more, is unable to get up, seems to be taken with paraplegia, and dies.

“ At the post mortem no meningitis was detected. The cephalo-rachidian fluid was clear, citrine in color and in small quantity. The cerebellum is slightly congested. On the *anterior third of the right cerebral hemisphere* there are fine *hemorrhagic spots*. The brain has a grayish tint and is soft in consistency. A transversal section of both hemispheres shows that the lateral ventricles are normal, *but in the white substance of the right frontal lobe there are deep alterations, tumors like*. The white substance is softened, difficult to cut. It is amber-colored, *with fine petechias*. The bulb and cervical marrow was normal. The histological examination revealed the true nature of the neoplasm; it was a sarcoma.

“ This observation is instructive, showing as it does that a *cerebral tumor may remain latent for a long time and suddenly, abruptly manifest itself by an apoplectic or epileptiformictus, without clear localized symptoms.*”

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AN ADDITION TO OPHTHALMIC VETERINARY SURGERY.—If not in use in veterinary medicine, the puncture of the sphenoidal sinuses, so as to empty them of their contents, has been already performed in human surgery, where cases of suppurative sphenoidal sinusitis have been observed.

Lieutenant H. J. Constant Thomassen, professor at the Royal Military School of Breda, has in the *Revue Generale* of Leclainche called attention to the indications that might be seen in horses and to the operation as he has performed it.

Suppuration of these cavities, whatever may have been its cause, will have for result neuritis of the optic nerve and amaurosis, and complete atrophy of the nerve may follow. Such, at least, seems to have been the condition of the cases spoken of by Lieutenant Thomassen.

The first case was in a mare which had had for some time double biocular amaurosis, of unknown origin, and to all appearance sudden in its manifestations. She was entirely blind, the eyes fixed and stiff in their motions, pupils dilated, the papilla of

the globe atrophied and the retinal veins dilated. The animal was destroyed. At the autopsy both optic nerves were found atrophied. The sphenoidal sinus was filled with orange-colored fluid. The opening of communication between it and the maxillary sinus was closed with polypous granulations.

The second case was again a mare which had had a cough and a nasal discharge for which she had been treated and had been able to resume work. One morning it is noticed that she seems to be fearful and hesitating in her actions. Turned out loose among others, she hesitates in walking, stops near another horse, which kicks her. She stands still, and when examined she is found completely blind. She has also exophthalmic paralysis of the muscles of the orbit. With the ophthalmoscope she shows the beginning of atrophy of the papilla, hyperhemia of the blood vessels. The discharge from the nose seems to be related to a sphenoidal sinusitis; compression of the optic nerves as well as that of those of motor muscles of the eye are suspected. Puncture of the sinus is decided.

After waiting a few days, when then the complete atrophy of the papilla of both eyes has progressed and is well marked, and of course restoration of the sight is beyond hope.

The animal is anesthetized with morphine and chloral, tracheotomy is performed in the middle of the neck and the laryngeal region well disinfested, an incision is made on the median line, the larynx is open, as in Williams' operation for roaring, and anesthetized with cocaine. An electric lamp permits the examination of the part, exposing well the "fornix pharyngis" and the openings of the two Eustachian tubes. Between these two a trocar, that invented by Vermeulen of Utrecht, which is used in man, is pushed through the bone with a little hammering, entered the cavity of the sinus and gave escape to a certain quantity of fluid. There was no bad sequelæ, and after a few days the animal had entirely recovered from the effects of the operation. On account of the advanced atrophy of the nerves, and no chance of recovery from the amaurosis, the animal was afterwards destroyed. At the post mortem it was observed that the opening of

the trocar had been too small and that the collection of fluid had returned.

The conclusions of Lieutenant Thomassen, after giving the above facts, are that: " Amaurosis of one or both eyes may be caused by sphenoidal sinusitis and that, on account of the small risk attached to the operation and the great danger of blindness, one must not hesitate to open the sphenoidal sinus as soon as such diseased state is about suspected." But certainly the examination of the condition of the eye with the ophthalmoscope and the degree of atrophy of the papilla must decide as to the proper indications for the interference.

\* \* \*

EXTENSIVE LOCAL ANESTHESIA.—The subject of anesthesia is one always of great interest to surgeons. The number of the publications, of new researches, which relate to it, show that the interest is still existing and that the ideal method remains to be found. Most of these investigations, during the last few years, appear to have a tendency to diminish the use of general anesthesia by ether or chloroform inhalation. This method has indeed again been the object of discussions, perhaps sometimes exaggerated, although to-day we are better acquainted with its dangers and the accidents that may accompany its application. And to supplant it various processes have been proposed to either produce narcosis by other means or to realize the anesthesia of surfaces of the body, more or less wide, without entire loss of consciousness.

" After each anesthesia," says Dr. Lenormand, in *Un Mouvement Medical*, " which passed by various phases of ups and downs before it reached the place relatively modest that it occupies to-day in practice, we have seen proposed the mixed anesthesia by scopolamine, morphine-chloroform, that by rectal injection, by intravenous injection of ether, etc. None of these methods seem to seriously threaten the classic inhalation for general narcosis; their technical complexity, their insufficiency, their dangers will always present their generalization. They were inter-

esting attempts, perhaps liable to improvements, but will not be methods which will be accepted as of daily application.

With these new methods, however, the field of action of local anesthesia has been developed, and we are now far indeed from the hesitating and limited applications of the beginning.

The substitution of novocaine-adrenaline, which allows the use of much larger doses, has much contributed to the extension of the method. And specially that which has for object to bring the anesthetic in direct contact with the nervous trunks of a field of operation, producing more simply and more surely the insensibilization of a wide surface.

It is this extensive application that two German surgeons have put in practice recently. Drs. Hirschel and Kulenkampf have had simultaneously the idea of producing the complete analgesia of the entire upper extremity by novocainisation of the brachial plexus in man by methods which are relatively simple. The techniques consist in reaching the plexus by a single prick made through the skin and without previous incision. Hirschel makes its injection directly through the axilla. Kulenkampf reaches the nervous trunk by a puncture, above the clavicle, as it comes out of the interscalenus triangle. Hirschel has reported three cases of severe operations where this extensive anesthesia permitted him to amputate forearms. Kulenkampf has resorted to it in twenty-five cases of abscesses, wounds of the hands or forearm, fractures and amputation.

Of course it does not seem that this method of obtaining extensive local anesthesia may find its indication in our veterinary practice, but it is a progress in surgery which even to veterinary surgeons must be of some interest.

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URINARY POUCHES.—In human medicine this name is given to more or less developed sacciform cavities, developed at the expense of the coats of the urethra and where the urine collects and remains between evictions. Some are simple defects of conforma-

tion and of congenital origin; others are the result of accidental dilatation of the urethral walls.

When a permanent obstacle to the flow of urine occurs, such as a stricture of the urethra, a calculus or a foreign body, the rupture of the bladder takes place most fatally under the progressing pressure of the collected urine. However, and specially in youth, when the vesical muscular structure is very strong, it is possible for a spot of less resistance to exist, no more near the bladder, but on the course of urethra, and then under the influence of the pressure made by the urine above the obstacle, the urethral coats give way some, become distended beyond their limit of elasticity, do not retract any more, and then a pouch more or less developed is formed. In fact, one can almost presume of the case where the urinary pressure will overcome the resistance of the walls of the pouch, promotes its rupture and be followed by the infiltration of the peri-urethral cellular tissue and the formation of a chronic urinary abscess.

In man these accidents are extremely rare. Writers acknowledge that, if theoretically the formation of a urinary pouch is easy to explain, clinics have not demonstrated that strictures of the urethra are commonly the cause of urinary pouch. In veterinary medicine this lesion is still more rare, as, according to Professors Besnoit and Robin, it has not yet been recorded. And yet, in some species of animals, ruminants especially, the etiological conditions of the accidents are normally observed, such as the length, narrow dimensions and multiple flexuosities of the urethra, promoting urinary stagnation, or the deposits of calcareous concretions on the walls of the canal, or again the stopping of calculi.

The symptoms presented usually are well described by Professors Besnoit and Robin in the *Revue Veterinaire*, where they describe a case which was brought to their examination, viz., in a yearling bull, which had bad habits of masturbation, suffered with balanitis, which were followed by violent and severe colics, and a few days after a swelling on the perineum. It was then as big as the head, situated in the median line and ovoid in shape. It extended from the ischial arch above to the sigmoid flexure of the

penis below. It was painless and fluctuating. By gradual pressure a certain quantity of urine was squeezed out by the meatus and the tumor was reduced in size. There was a certain amount of incontinence. Once emptied, the tumor was soon filled again and reappeared little by little, and when it had reached a certain size a spontaneous stream of urine escaped. An explorative puncture revealed the true nature of the contents of the tumor.

The animal was not put under treatment, but destroyed. The post mortem will be found among the contents of the French Review of this month.

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NEOL.—The antiseptics which have been in use for years are now almost entirely ignored in most large hospitals. Phenic acid, corrosive sublimate, iodoform, formol, salol, boric and picric acid are now making room for *neol*, a new cicatrizing antiseptic, which most of our medical journals are referring to.

Neol is a persulphate sodico-potassic preparation of electrolytic origin and obtained by a new process. It gives off slowly but continuously oxygen and ozone. It is an aqueous fluid with an aromatic odor and a slightly acidulated taste. It mixes well with water, glycerine or alcoholic mixtures. It has no toxic properties and can be used in large doses with impunity. It has antimicrobial properties, due to developing ozone, and its antiseptic action is peculiarly efficacious. The developing ozone gives it also its keratoplastic properties by activating the proliferation of cells and regeneration of tissues. It has also analgesic and decongesting properties.

Powerful antiseptic, with rapid action, it finds its application in the treatment of rebellious suppurations.

It is a powerful cicatrizing agent, which in extensive burns gives rise rapidly to the development of cicatrizing epidermis.

It is a vasoconstrictor or decongesting agent, as is proved by the effects that are obtained in inflammatory cedemas. As to its analgesic properties, they are manifested almost immediately, a few seconds after its application. It is besides that lasting and sometimes permanent.

Neol has found in human medicine quite extensive application. As dressings for the treatment of burns, ulcerations, recent or old wounds. As simple local coatings in sore throats, stomatitis. As gargles, or again in the free washings of cavities, metritis, vaginitis or rhinitis.

It seems that the antiseptic properties of neol might find their application in veterinary medicine, but so far I have not heard of its use among veterinarians, yet it might be good to try, if ever it finds its way in America.

\* \* \*

BIBLIOGRAPHY—DISEASES OF THE DOG AND THEIR TREATMENT.—This is a most important addition to veterinary literature for English readers, students and practitioners. It is the translation, with special authorization from the original author, by *Doctor Alexander Glass, A.M., V.S.* (McGill University), of the classical work of *Dr. George Muller*. The translator is lecturer on canine pathology in the Veterinary Department of the University of Pennsylvania and the author professor and director of the clinic for small animals at the Veterinary High School at Dresden. With such titles the reader can be assured of the superior qualities of the book he has in his hands.

Not having had the opportunity of seeing the previous editions published of the work, I can only notice that this is the third edition, revised and enlarged. Another proof of the welcome it has already received.

In his preface Dr. A. Glass tells us of the additions that he has made and of the differences that he has introduced specially in the therapeutic portion of the German work. He firmly insists on the manner of preparing and administering drugs in as small doses as possible, "as it frequently happens that the excitement caused by the administration of large amounts of decoctions and infusions in nervous or highly bred animals does more harm than the original disease."

Dr. Muller, in his preface, tells of his endeavors to write a work for the requirements of the profession, of the care he has

taken to avoid speculative facts or hypothesis. The diagnosis has been given the most prominent place, and the author has endeavored to establish the symptoms with their relation to the disease and to confine their therapeutic treatment to a knowledge of normal and pathological anatomy and physiology."

It is indeed a good thing to read these two prefaces, and principally that of Dr. Muller, for if we throw a glance at the literature on the subject of canine pathology, it will be easy for one to convince himself that the book is truly filling a wanted need. English works since the days of Youatt, passing by those down to the days of Steel, Stonehenge, Blaine, Mayhew, Mills, Hill and many others, do but an incomplete justice to the modern state of this branch of our medicine. French works are far from having books on diseases of dogs which can compare with those that there are on the diseases of other animals. And, as far as I know, the old German work of Hertwig has passed long ago its stage of usefulness.

And if we consider the immense importance that canine pathology has taken in the last few years as a specialty by the many peculiar circumstances and changes that have occurred in this species of animals and in general practice of the veterinarian, and also by the important place which it is occupying in comparative medicine, we can without hesitancy say that in undertaking the work that is before us Dr. Glass has done the profession a great good, and that there is no doubt that *Diseases of Dogs* will really prove *the* book for students and practitioners. It is not so often that such publications are made. A minute and detailed consideration of this work is not possible with the space at my command. It covers nearly 500 pages, illustrated by 178 small plates in the text and 14 full-page plates, 7 of which are colored. The description of the diseases is made by the divisions of apparatus, digestion, respiration, circulation, etc., etc.

It is printed on quite thick paper, in handsome, easily reading type, and shows that the publisher, Alexander Eger, has been doing his best to add to the general value of the work.

We believe *Diseases of Dogs* is called to a grand success, and deserves it.

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BIBLIOGRAPHIC ITEMS.—We have received: *Veterinary Notes* of December, 1911, Parke, Davis & Co.; the *Agricultural Journal of the Union of South Africa* for November, containing the *Treatment of Redwater in Cattle with Trypanblue*, by Dr. Arnold Thisler; *Nodular Disease of the Intestines of Cattle*, by Walter Jowett, F.R.C.V.S., D.V.H.; *Blackhead, a Disease of Young Turkeys*, by the same.

From the Bureau of Animal Industry: *Bulletin 142, Dourine of Horses, Its Cause and Suppression*, by John R. Mohler, V.M.D., and *Bulletin 137, on Anthrax, with Special Reference to the Production of Immunity*, by C. T. Dawson, M.D., D.V.S.

*American Veterinary Education and Its Problem*, by Director V. A. Moore. A paper presented by the chairman of the Committee on Intelligence and Education of the A. V. M. Association at its annual meeting in Toronto, August, 1911. Powerful argument, worthy of its author.

A. L.

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FURTHER SOUND AND SUFFICIENT REASONS WHY  
EVERY VETERINARIAN IN THE UNITED  
STATES SHOULD SUPPORT THE UNITED  
STATES ARMY VETERINARY BILL.

The ignominiousness of the status of the veterinarians in the United States Army to-day, the predicament, disgraceful to the whole veterinary profession outside the army, in which the veterinarians within the army find themselves to-day, is dwelt upon in the brief written in defense of the bill, published in the January number of the REVIEW, under "The Present Status of Veterinarians." The neglect of the veterinarian by Congress is enough

to drive the profession to distraction, were it not for the invincibility which strengthens the hearts and empowers the minds of most of us. The painful and unbearable predicament of the veterinarian in the army is almost like a chronic, angry sore in the side of the profession in America. We cannot heal that sore, root out the cause, nor stand upright like men and equals of the other professions in the army, until, keenly feeling the disgrace of it, we rise, with the unified, organized strength of the profession, like one man, to remove it. The organized strength, the herculean power of a well-aroused national veterinary association, combined with about sixty state and other local veterinary associations, is at this hour at work as never before, driving the bill for the relief of the veterinarians in the United States Army through Congress.

What is the bill? What is its purpose? And what are the sound and sufficient reasons why you and each of you should support it?

The bill was also printed in the January number of the REVIEW, under the "Army Veterinary Department." It is short, but, unlike many hundreds of bills offered for the consideration of Congress, every syllable of this one is of the utmost value to the profession as a whole, a fact which the future, should the bill pass, will unfold; and it has crystallized within it the needs of the veterinary service of the army as they have been discovered as a result of the lessons drawn from thirty or forty years of the bitterness of defeat of army veterinary legislation and by the crucifying experiences of veterinarians within the army service itself.

What, now, is the purpose of the bill?

The War Department of the United States is the *only* war department of *any civilized country* which does not give official recognition to the veterinarian as a professional man. He is not, and cannot be, as things are at present, the official, social or professional equal of members of any other profession in the army, such as those of medicine (physicians), theology (chaplains), the dental (dentists), mechanical engineers. The veterinarian cannot claim such rights, whatever be the brilliance of his intellect, the fineness of his sensibilities or moral sense, the attractiveness

of his social nature or deportment, because there is no law granting him these rights and recognizing his fitness to meet on terms of absolute equality with those who otherwise would be his competitors. The dilatory tactics of Congress for over a quarter of a century in not granting this professional recognition to the veterinarian by statute has reacted on veterinarians in all walks of life outside the army. Contempt of the veterinarian in government circles tends to breed contempt of him everywhere. Of course the inequalities are groundless; there is no justice in the situation. But where there is no law conferring on the veterinarian privileges arising from protective rights and giving him proper, official, professional recognition, the assumption is that he must remain without justice until Congress comes to his aid. The purpose of the bill to consolidate the veterinary service in the United States Army and to increase its efficiency is to bring relief to the veterinarian and to cure the evils of veterinary life in the army as it is to-day. This can only be done by making veterinarians commissioned officers, in the same way as physicians, dentists, chaplains, engineers and those who are representatives of the law, the judge advocates, are commissioned officers in the army. For the purpose of giving veterinarians commissions in the army this bill is framed.

What are the sound and sufficient reasons why the bill should and will have the active support of every veterinarian? 1. It metes out justice to our profession in the army and clears up the bad condition in which the veterinarian is placed at present. 2. It removes the stigma which the embarrassing situation of the army veterinarian places on the profession as a whole. 3. It permits the members of our profession to advance as other professions advance in the army, to get recognition for work accomplished, and to be on a par with all.

If any veterinarian who *knows* these sound and sufficient reasons for giving his personal, steadfast and staunchest support to the army veterinary bill will not do it, we will be much mistaken. The grievances of the army veterinarians are *your* grievances. Place them before your representatives in Congress as such.

Refer to the bill as House Bill 16843. The measure has been introduced into Congress. The House Committee on Military Affairs is favorably impressed with it. Drive the bill through by besieging Congressmen in its favor. We can win in the present session of Congress if we work with a will. Work will win. *Work will win.*

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COMMISSIONER PEARSON RESIGNS.—On page 771 of this issue of the REVIEW we have published a copy of the resignation of the Hon. Raymond A. Pearson from the position of Commissioner of Agriculture of the State of New York, and its acceptance by Governor Dix. Thirst for greater knowledge (which was also a characteristic of his late brother, Leonard Pearson, one of the greatest men the American veterinary profession has ever numbered in its ranks) is taking from the Empire State the fairest-minded, most efficient and best Commissioner of Agriculture that had ever filled that important office up to the time of his appointment by Governor Hughes in the spring of 1908. And he will be greatly missed, not only by the farmers and stockraisers, who had learned to appreciate his fair-mindedness, integrity of character and honest interest in their behalf, but also by the entire veterinary profession of that commonwealth. We believe, however, that New York State should not feel too keenly the loss of Commissioner Pearson, in consideration of the fact that by their loss the country in general will benefit by the work the Commissioner has relinquished his office in the Empire State to take up; *i. e.*, the study of agricultural conditions in Europe; but should feel no small degree of pride in having *had* as its Commissioner of Agriculture a man big enough and ambitious enough to have laid aside so enviable and important a position for the further pursuit of knowledge to be used for the general betterment of agricultural conditions in our country and the betterment of mankind in general.

## ORIGINAL ARTICLES.

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### OBSERVATIONS CONCERNING THE PATHOLOGY OF ROUP AND CHICKEN-POX.

BY C. M. HARING AND C. A. KOFOID, UNIVERSITY OF CALIFORNIA, BERKELEY,  
CALIFORNIA.

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On the Pacific Coast and doubtless in many other localities the disease known as roup or avian diphtheria constitutes the chief obstacle to the poultry industry. In California and in some of the Southern States a disease called chicken-pox or epithelioma contagiosum is prevalent, and is often associated with roup. These diseases, affecting chickens, pigeons and turkeys, occur together throughout the world, although epithelioma contagiosum appears to be largely confined to warm temperature and tropical regions.

Among investigators of poultry diseases there has long been a difference of opinion as to whether nasal roup, avian diphtheria and epithelioma contagiosum were one and the same disease, or whether they were etiologically distinct. Ward has called attention to the occurrence of roup associated with chicken-pox, and has described the symptoms as follows: "The disease is characterized by a more or less viscid, ill-smelling, purulent catarrhal exudate involving the mucosa of the conjunctivæ, nares and the suborbital sinuses communicating with the latter. The exudate, on account of its viscid nature, and on account of the tortuous passages for its exit from the head, is not readily discharged through the nostrils or cleft palate. In the sinuses, which have no provision for natural drainage, the exudate collects and causes a bulging of the face in front of and below the eyes. When confined, as

in the sinuses or conjunctivæ, the viscid exudate undergoes a rapid transformation into a cheesy mass. This stage of the disease is referred to by poultrymen as 'swell-head.' Earlier stages of the disease, in which the exudate is merely noticed in the nostrils, are distinguished by poultrymen with such names as 'simple catarrh,' 'contagious catarrh,' 'ordinary cold,' etc. Exudates varying from diphtheric to croupous, according to the stage of development, appear with considerable frequency upon the mucosa of the mouth, pharynx and larynx. Wart-like epithelial tumors of the skin, especially of the head, are very frequently observed in roup-y fowls. The clinical evidence suggests strongly that these tumors (chicken-pox) are related etiologically to the roup."

The statements of Friedberger and Frohner, as representing the opinions of a number of European workers, are interesting in this connection. They make a distinction between croupous diphtheritic inflammation of the mucosa caused by bacteria and one caused by protozoa (class, "Gregarina"). The last type is distinguished by the occurrence of contagious epithelial tumors of the skin. Kinsley, in describing the occurrence of epithelioma contagiosum in the neighborhood of Kansas City, has mentioned the difficulty of differentiating between this disease and roup. Schmid concluded from inoculation experiments that typical pox lesions occurred in fowls having diphtheria, and that the two diseases had the same etiology. He recognized three forms—that affecting the mucous membranes, that affecting the skin, and a combination of the two. Carnwarth and other investigators have obtained similar results. Löwenthal, Burnet, Reischeuer and Stickler are also on record as favoring the belief that roup (Schleimhautrekrankungen) and chicken-pox (Geflügelpocke) are identical. The observations of Bordet and Fally tend to disprove those of Schmid. Fally observed that a recovery from roup does not protect the fowl from chicken-pox, and *vice versa*. He believes that the two diseases are distinct, but admits that a fowl may have both diseases at the same time.

Ward has described the symptoms of chicken-pox as follows:

“ With us it is characterized by superficial wart-like tumors occurring upon the naked parts of the head. These are usually covered with a scale of exudate. Upon removal of the scab the tumor exhibits a whitish shiny mass that cleaves readily into minute cylindrical masses arranged perpendicular to the skin. The tumors spread rapidly from the primary focus.

“ When the eyelids become seriously involved they necessarily become closed, which results in death from starvation. Ordinarily the tumors are present two or three weeks, and disappear without having caused injury. Chicken-pox is readily transmissible by inoculation. A hypodermic needle, after being passed through a tumor, is used to prick the skin. Almost without exception a distinct tumor becomes recognizable in five days.”

In cases produced by artificial inoculation the disease first manifests itself by a whitening and roughening of the skin at the points of inoculation. The period of incubation may vary greatly, according to the virulence of the virus. In young chickens infection of the skin over the breast is common. This evidently occurred by direct inoculation from contact with the infected ground of the chicken yard.

Many organisms have been described by European investigators, each claiming that he has found the specific cause of roup. Moore found a number of the bacterium septicæmia hemorrhagica group associated constantly with roup lesions. Harrison and Streit isolated two species of bacteria, with each of which they were able to produce roup. Mack has endeavored to explain the disease on anatomical grounds as a non-specific mixed infection. Hadley believes that coccidia are sometimes the cause of infectious roup.

The controversy regarding the etiology of epithelioma contagiosum is even more complicated and confused than that regarding roup. The intracellular inclusions which are so pronounced and striking in sections of the epithelial tumors of chicken-pox have been thought by Sanfelice and Friedberger and Frohner and others to be “ gregarina.” Reischauer has described a partial life cycle of changes which occur in these cell inclusions.

Mark and Stickler have proven by filtration experiments that the virus will pass through a Berkefeld filter, and have inferred that the organism is, therefore, ultra-microscopic. However, it has been pointed out that the spore stages of certain protozoa may be so minute that they are thus filterable. Borrel has described a small coccoid body which has been uniformly found in smears stained with Giemsa stain. Some investigators are of the opinion that this structure is a protozoan organism, and is the specific cause of the disease. Prowazek has established a new group of protozoa, which he designates as chlamydozoa, to receive this organism and similar ones occurring in vaccinia, molluscum contagiosum, trachoma, etc. Lipschütz has suggested that this organism be named *Strongyloplasma avium* (Borrel).

*Investigations Concerning Roup and Chicken-pox at the University of California.*—Observations concerning these diseases were begun at this university by Ward in 1901. Papers reporting the results of his work are published in the 1904 and 1905 proceedings of the American Veterinary Medical Association. It has been observed by Moore and others that roup is not always readily transmitted by inoculation or association. Ward, in inoculation experiments with material from fifteen chickens affected with nasal roup, representing ten flocks, has demonstrated that the disease is readily transmitted by inoculation, and that the virus of chicken-pox is sometimes associated with roup. A study of his description of the experiment, as reported in the proceedings of this association for 1905, shows that the disease failed to be transmitted in a majority of instances. Only four of seventeen cockerels inoculated on the skin developed nasal exudates resembling roup, and one developed epithelioma contagiosum.

The following summary of our infection experiments with roup indicate that the disease may be transmitted by inoculation, but that association is likewise a certain means of transference:

*Experiment No. 1.—Transmission of Roup by Association:* Two dozen healthy chickens were taken from a yard where there had been no outbreak of roup. They were divided into two equal groups, each dozen being kept in separate and isolated places.

With one group were placed eight slightly diseased cockerels, the type of the disease in each bird being the nasal form of roup. The predominating symptoms were a liquid or semi-solid exudate from the nostrils, usually not very evident unless forced out by pressure. The conjunctivæ was also affected in six of the fowls. No diphtheritic patches were observed in their mouths. As a result of association of the twelve healthy with the eight diseased fowls all of the healthy fowls, with one exception, contracted roup. The period of incubation varied from five to twenty-two days. The virulence of the virus is shown by the fact that in four of the fowls death occurred in forty-eight hours after the first symptoms appeared. The nasal and conjunctival form predominated. No diphtheritic patches were found in the mouth, throat or trachea.

*Experiment No. 2—Transmission of Roup by Inoculation:* A virus was obtained by taking and mixing in a beaker an exudate from the nostrils of the eight diseased fowls used for introducing infection in experiment No. 1. Six healthy fowls were vigorously inoculated with this virus by thoroughly scarifying the comb, wattles, palate, and by injecting the virus mixed with water into the suborbital sinus, and into the nostrils. Each fowl was kept in a separate coop; symptoms of nasal roup developed in two of the birds; the period of incubation in one case being ten days and in the other eighteen days. One of these birds developed a diphtheritic patch on the throat at the point of inoculation. Three control fowls, which had been injected with sterile water, remained healthy.

*Experiment No. 3—Inoculation Roup Transmitted by Association:* In order to prove that the diseased condition in experiment No. 2 was due to a roup virus and not due to a mechanical laceration, or to a non-specific infection, the two fowls which developed roup in experiment No. 2 were placed in confinement with two healthy fowls. These two previously healthy fowls developed nasal roup in twelve and fourteen days, respectively.

*Experiment No. 4—Inoculation with the Virus of Chicken-pox:* (Stock virus No. 1.) The original source of this virus

was chicken-pox scabs collected from fowls in Berkeley, May, 1906. A quantity of virus was obtained by inoculating the combs and wattles of young cockerels. The period of incubation averaged ten days. No diphtheritic or nasal symptoms occurred. A microscopic examination of one of the tumors resulting from inoculation showed the characteristic epithelial formation of chicken-pox. With this stock virus about thirty fowls have been inoculated by scarification of the comb, wattles and palate, and by an injection of sterile water and ground-up scabs into the sub-orbital sinus and nostrils. The times of inoculation were on various dates between May, 1906, and September, 1911. The stock of virus (scabs) was kept in a test tube plugged with cotton, the tube being left in a desk drawer from 1906 till 1910, and in an open box in the corner of the laboratory during 1910 and 1911. No cases of nasal involvement have resulted from the use of virus No. 1, although the occurrence of a diphtheritic membrane in the throat was common. The structures typical of epithelioma contagiosum have been demonstrated in these diphtheritic patches in two instances.

(Virus No. 2.) The source of this virus was from chicken-pox scabs received from Hawaii in May, 1906. Five fowls were inoculated with this virus, with results similar to those obtained with virus No. 1.

(Virus No. 3.) Received in April, 1908, from Montana, Inoculations with this virus have been made on six fowls, with results similar to No. 1.

(Virus No. 4.) Obtained from Hawaii in July, 1911. Eight fowls were inoculated and developed typical chicken-pox, the average period of incubation being ten days. They also developed typical nasal roup, the symptoms appearing in the first fowl in fourteen days after inoculation. This roup spread to other fowls kept in adjacent coops. We believe that virus No. 4 is a mixture of roup and chicken-pox.

*Other Experiments.*—In two trials with pigeons we have failed to produce epithelioma contagiosum by inoculation with virus from fowls. This is in accordance with the findings of

Borrel, who was able to transfer the disease from pigeons to fowls, but could not again transmit it back to pigeons.

We have been able to produce a diseased condition simulating roup, or avian diphtheria, by the injection of micrococcus pyogenes aureus, and also by mechanical injury.

*The Resistance of Chicken-pox Virus to Germicides.*—Attention has been called above to the fact that chicken-pox virus will live a long time under conditions of exposure to light and dryness. Following is a summary of the tests to determine the resistance of the virus to germicides. Lack of space renders it impracticable to give the test in detail. The virus, or material with which the tests were conducted, consisted of dry pox scabs which had been reduced to a fine powder by grinding in an earthen mortar. After saturating the virus with the germicide and allowing a certain amount of time to elapse, as indicated in the following table, the virus was inoculated in the fowls by scarifying the comb with a sharp instrument which had been dipped in the virus:

5 per cent. aqueous solution of carbolic failed to kill the virus in 20 minutes.

2 per cent. liquid cresolis compositus failed to kill in 20 minutes.

2 per cent. potassium permanganate failed to kill in 20 minutes.

2 per cent. copper sulphate failed to kill in 20 minutes.

Tincture of iodine, full strength, failed to kill in 10 minutes.

Bichloride of mercury, 1-1000, failed to kill in 20 minutes.

Steam heat at 100 degrees C. failed to kill the virus in 5 minutes.

Steam heat at 100 degrees C. killed the virus in 30 minutes.

Dry heat at 200 degrees C. killed the virus in 30 minutes.

Powdered pox scabs saturated with physiological salt solution and allowed to decompose for 10 days in a warm place proved non-virulent.

Dry powdered pox scabs kept in a test tube from May, 1906, to September, 1911, proved virulent.

*Immunity to Chicken-pox.*—By numerous inoculations with virus No. 1 we have proven that an attack of chicken-pox confers immunity, which is partial on the seventh day, and becomes

complete on the twelfth day after inoculation. This immunity persists for at least three months. We have no data for determining how much longer fowls remain immune. Four fowls affected with roup have been found susceptible to chicken-pox, and two fowls immune to chicken-pox have been infected with roup by association. This is in accordance with the results of Fally, above mentioned. Fowls may be inoculated on the tip of the comb with chicken-pox, and the lesion cut off on the tenth day, after which the fowl will be immune.

*Observations Concerning the Pathological Histology and Etiology of Chicken-pox.*—About five hundred sections were prepared from the lesions appearing on the comb, wattles and mucous membranes of the mouth and throat of fowls inoculated with virus No. 1. The virus was selected because, as we have previously pointed out, there is reason to believe that it was not contaminated with roup. The specimens for sectioning were taken at varying intervals after inoculation, mostly from the third to the twelfth day, were fixed in Zenker's fluid, imbedded in paraffine in the usual way, sectioned as thin as possible and stained by the following methods: (1) Hematoxylin and eosin, (2) eosin and polychrome methylene blue, (3) iron hematoxylin, (4) Mallory's connective tissue stain, (5) Giemsa, (6) Heidenhain with Bordeaux red, (7) Mühlen's and Hartmann's stain, (8) Von Wasielewski's stain, (9) Mann's eosin-methylene blue, (10) osmic acid, and (11) Scharlach R.

A set of three hundred slides, prepared by the last six methods, was made by the preparateur in the Pathologisches Institut at the University of Munich from imbedded material which we furnished them. We also made and examined a large number of smears after staining with eosin and polychrome methylene blue and with Giemsa's stain.

The morphological changes in the tissue elements which have been noted by those who have worked on the disease have been clearly demonstrated in our material. The epithelial tumors are produced by a hyperplasia of the epithelium, due to an increase

both in the size and number of cells. The zone of growth is in the stratum of Malpighii, the principal region of proliferation being in the outer edges, from which the cells increase in both directions. The proliferating epithelium forms cell nests sinking into the dermis, surrounded by thick bands of connective tissue, which contain blood vessels with thickened walls. The rapidly proliferating epithelial cells of the Malpighian layer are seen thickly studded with granules. The nucleus contains deeply staining chromatin bodies, which are in an active process of proliferation. Karyokinetic figures are common in this region. Farther out in the epithelial tumor mass the cells are greatly increased in size and have relatively fewer granules. The nuclei are paler and show little evidence of cell division. In these cells are the large cell inclusions, which are very striking in appearance, and which Reischauer and others have thought either to be or to contain the protozoan organisms, the causative agent of the disease. There is usually but one of these bodies in each cell. They vary in size from 5 to 20 microns; most of them are round, although some of them are quite irregular in shape. They are at least partially fatty in substance, as they stain black with osmic acid. When eosin and methylene blue are used they stain a faint pink, resembling somewhat the Negri bodies found in the brain tissue of rabid animals, although they are usually much larger. They seem often to have no definite internal structure, being usually homogeneous in appearance, though with Giemsa and other differential stains structures similar to those figured by Reischauer can be demonstrated. Still farther out in the epithelial mass the cells are very large and show evidence of degeneration; here the cytoplasm stains poorly and has but few granules. Burnet has called this condition hydropic. In the center of the older epithelial cell masses the cells are so degenerated that they form a necrotic mass. The nucleus of the cell first degenerates. The central necrosis rapidly extends, involving the greater part of the tumor mass. The necrotic mass swarms with micrococci and other bacteria. It should be noted that we have isolated in pure culture two varieties of micrococci from chicken-pox tumors, one giving a white

growth and the other a yellowish growth on agar. Attempts to produce chicken-pox with these organisms have failed.

Mr. Clifford Sweet, B.S., a student in the University of California College of Medicine, has been devoting his summer to a study of chicken-pox under our direction with reference to life cycle and complement fixation. Sweet has been unable to extend our knowledge of a life cycle, and is inclined to believe the large cell inclusions are not conclusively differentiated from products of cell degeneration. In fixed preparations stained with Giemsa stain and with hematoxylin and eosin, and in fresh smears stained with Giemsa's stain, we have observed numerous acid staining bodies about one-quarter of a micron in size, which appear to be the body described by Borrel, and which Lipschütz has named *Strongyloplasma avium*. Since Mark and Stickler have demonstrated that the disease is due to a filterable virus, it is possible that this virus may be represented in some by these bodies. The virus, or whatever be the cause of the disease, evidently is present in the blood of the fowl at some stage of the disease, as Sweet has produced typical localized lesions of chicken-pox by intravenous injections of the virus and by intravenous injection of the blood taken from diseased fowls.

*Complement Fixation Reaction.*—Antigen was prepared from the liver of infected fowls and from the "tumors" removed from the heads of infected fowls by the method of Michaels and Lesser. The liver extract proved most satisfactory, and will be used hereafter. Blood was taken from the brachial artery of normal fowls and from fowls at varying periods after inoculation with epithelioma contagiosum. The antigen and serum to be tested were added to the hemolytic system, now so widely used for diagnosis of syphilis and glanders. Quantity for quantity the serum from the diseased fowls showed a fixation of complement not shown at any time by the normal serum. As yet we have not been able to make this as striking as the reaction which we have seen in similar tests on the blood of glandered horses, but it is sufficiently clear, we believe, to be of considerable value.

At present we are not fully prepared to say what the signifi-

cance of this complement fixation is, but it is evident that a specific anti-body is developed during the course of the disease.

### CONCLUSIONS.

1. There is good evidence to believe that nasal roup (Schleimhautrekrankungen) and chicken-pox, or epithelioma contagiosum (Geflügelpocke) are two distinct diseases.

2. Immunity to chicken-pox does not confer immunity to roup, nor *vice versa*.

3. Diphtheritic lesions in the mouth and throat of fowls may be produced by either roup, chicken-pox or mechanical injury, followed by mixed infection of various organisms. In diphtheritic lesions due to chicken-pox a microscopic examination shows the presence of the characteristic cell inclusions of epithelioma contagiosum. Epidemics have been observed in which the fowls were affected with both chicken-pox and roup at the same time.

4. Lesions similar to roup and diphtheria produced by mechanical injury or by infection with pyogenic bacteria cannot be transmitted by association.

5. Blood of diseased fowls, when injected intravenously, produces chicken-pox.

6. The blood of fowls affected with chicken-pox has the property of complement fixation to a greater extent than the blood of normal fowls.

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DR. STANTON YOUNGBERG, Lake Park, Minn., has returned to Manila, P. I.

DR. ADOLPH EICHHORN, of the Pathological Division of the Bureau of Animal Industry, Washington, D. C., will present a paper on "The Complement Fixation Method of Diagnosing Glanders" at the March meeting of the Veterinary Medical Association of New York City, and Prof. K. F. Meyer, Director of the Pennsylvania Livestock Sanitary Laboratory, will come from Philadelphia to discuss Dr. Eichhorn's paper. It is hoped the meeting room will accommodate all the veterinarians who will want to hear those two gifted gentlemen!

HORSE EXCELS AUTO.—It may be solacing to lovers of horses to know that the Frank Parmelee Transfer Company of Chicago, which has the contract for transporting passengers across that city from one railway station to another, has found after long investigation that automobiles are too expensive to run on short hauls. Mr. Charles A. McCulloch, general manager of the company, informed a representative of *The Rider and Driver* at the time of the recent stock-yards horse show that automobile agents had been trying every means to prove to him that machines were more economical than horses, but, he said, they had "not made good." He was anxious, of course, to supplant the horse if something better could be supplied, as he is "not in business for his health," but except on long hauls the horse has proven to be the best motive power. \* \* \* We are now using 700 horses and intend to increase the number.—(*The Rider and Driver.*)

## HANDLING A WHOLESOME MILK.\*

By C. J. MARSHALL, STATE VETERINARIAN OF PENNSYLVANIA.

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In presenting the subject of "Handling a Wholesome Milk" there are many factors to be considered. During the past few years much attention has been given to this subject by dairymen, dealers, sanitarians and the public at large. There is perhaps no other branch of agriculture that has received more careful consideration from a business or sanitary viewpoint. The capital invested in Pennsylvania in dairy farming alone runs into millions of dollars. Our commonwealth is one of the chief dairy States of the Union.

Much may be reasonably expected in the future in the line of developing better business methods and perfecting the intricate and perplexing questions that exist at present. That faults do exist none can deny, and for all parties concerned it is desirable that many of them should be cleared away as rapidly as possible. The bulk of this work will be done by dairymen and dealers themselves, not by force or compulsion from legislation or regulations of boards of health, but because they can be removed by better business methods—and public opinion demands that such faults be corrected.

The State Livestock Sanitary Board was organized for the purpose of protecting and perfecting the livestock interests of the State. Let us review what it has done and is doing, and see if more and better assistance can be expected in the future in protecting the health of animals, improving their sanitary surroundings, and thus make the business more profitable and attractive,

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\* Presented at the Annual Meeting of the State Breeders' Association and the State Dairy Union, Pittsburgh, January, 1912.

and at the same time furnish to the public a more bountiful supply of more wholesome meat and milk.

The Pennsylvania State Livestock Sanitary Board was organized under the act of May 21, 1895. There was some opposition at that time from a few good farmers, on the ground that too much authority was given to the board. It appeared to a few practical farmers that it would usurp their rights and privileges and that they would no longer be masters of their own properties, but would be compelled to take orders from this board in reference to managing or conducting their own private affairs. The board immediately began tuberculin testing of cattle for tuberculosis, and still more objections and criticisms were raised. The test was considered unreliable and dangerous. They feared that animals would react, whether tuberculosis was present or not, and that if the disease did not already exist this test would cause it. Pennsylvania was one of the first States in the Union to use the tuberculin test.

As the work progressed the opposition gradually faded away, and at the present time one seldom hears, in this State, serious objections to what the board is doing. It has always been the policy of the board to force no one to make a tuberculin test. In nearly every case the test has been made, only upon the request of the owner and before it was applied, he has been warned of what might happen. The owner in all cases has been required to fill out an application form stating whether the test was to be made at his expense or at the expense of the commonwealth. In this agreement he has obligated himself to do certain things, the principal one being that he will exercise all possible precautions in the future to prevent reinfection in his herd. He has also agreed to disinfect the premises if reactions are obtained. Much better attention should be given in the future to disinfecting the stables after the tuberculous cattle have been removed. In many cases better stables have been constructed, more and better systems of ventilation, lighting, drainage, etc., have been installed, and many herds have been freed from tuberculosis.

At the present time the principal objection to tuberculin test-

ing on our own native cattle is due to the fact that the State does not pay enough indemnity for those condemned. It has always been the policy of the Board to keep appraisements as low as possible. The actual condition of the animal at the time of appraisal must be taken into consideration. We must not appraise condemned animals at more than two-thirds of their actual value and the appraisal must not exceed forty dollars (\$40) for non-registered and seventy dollars (\$70) for a registered bovine. The owner is allowed the carcass, hide and offal. In former times the carcass was condemned in the case of all reacting cattle. Now reacting cattle are appraised and slaughtered under inspection. It is estimated that about seventy-five per cent. (75%) of the carcasses of all reacting animals are now passed for food.

The prejudice that was first met in reference to passing such meat for food is gradually dying out. The public is getting a better meat supply from such cattle than was the case before tuberculin testing was introduced. Under the present regulations the carcass is now consumed for food when the inspection shows that the disease was yet in an incipient stage, while formerly the meat was used, in many cases, after the disease had become chronic or further advanced. In cases where the carcass of a condemned cow is passed for food the owner is entitled to all he can get for the meat, hide and offal, providing that this sum, added to what the State will pay him, does not exceed ninety per cent. (90%) of the actual value of the animal. Where the carcass is condemned for meat the State pays the owner the entire appraised value, and he is entitled to what he can get for the hide and offal.

Under such arrangements the State is requested to do all the testing that it can handle with the present number of competent agents and be enabled to pay for the reacting animals with what appropriations have been made for such work. At the present time there are over one hundred (100) applications filed in the Harrisburg office for tuberculin tests to be made at the expense of the State. They are being assigned as rapidly as possible. Testing at the expense of the owner is done promptly. If more generous appraisements were made on condemned animals there

would be a decided increase in the amount of work required in this line.

It has been estimated that it would cost from four to five million of dollars to make one test of all the dairy cattle in the State and pay for the reactors at the present rate. For this reason it has appeared best to those who have had this work in charge that it should go on slowly and conservatively, in the hope that more economical and effective measures may be developed. In order to judge of the progress that has been made since the Board was organized the following figures will show the number of herds and cattle that have been tested each year, the number condemned and the number of herds that have been tested and found free from the disease. In reference to this last clause, it should be remembered that in most cases the test has been made only in herds in which the disease was believed to exist. The table on opposite page.

The table covers the subject of tuberculin testing in Pennsylvania herds during the past sixteen years. The last census report shows that we have 933,055 dairy cows and 191,001 dairy herds in the State. The board has tested on an average of less than one per cent. (1%) of the dairy cows in the State each year. During the sixteen years we have tested 8,902 herds, containing 120,309 head of cattle, and have found 18,359 reactors. In most cases the reactors have been killed under inspection. Four thousand one hundred and seventeen herds were found to be free from the disease. The average percentage of reactors during the sixteen years was 15.2%. The average percentage of tuberculosis in free herds is 46.2%. During the year 1911 the results have been most encouraging. Eight thousand and fifty-nine animals were tested in 622 herds; 911 reactors, or 11.3% of the number tested, were found. No reactions were discovered in 357 herds, showing that of the number of herds tested 57.4% were free from tuberculosis. This is the best percentage record obtained during the sixteen years since the board was organized.

The United States Census Report shows the average number of cows per dairy in Pennsylvania to be 5. The average

## RECORD OF TUBERCULIN TESTS ON NATIVE CATTLE.

| Year.       | Number of Herds Tested. | Number of Cattle Tested. | Number of Cattle Reacted. | Number of Herds With No Reactions. | Percentage of Animals Reacted. | Percentage of Herds With Reactions. | Percentage of Herds With Reactions. |
|-------------|-------------------------|--------------------------|---------------------------|------------------------------------|--------------------------------|-------------------------------------|-------------------------------------|
| 1896.....   | 432                     | 5,430                    | 1,191                     | 187                                | 21.9                           | 56.7                                | 43.2                                |
| 1897.....   | 626                     | 7,613                    | 1,099                     | 298                                | 14.4                           | 52.2                                | 47.6                                |
| 1898.....   | 582                     | 6,516                    | 1,162                     | 220                                | 17.8                           | 62.1                                | 37.8                                |
| 1899.....   | 429                     | 6,443                    | 1,107                     | 158                                | 17.1                           | 63.1                                | 36.8                                |
| 1900.....   | 651                     | 8,475                    | 1,314                     | 254                                | 15.5                           | 60.9                                | 39.1                                |
| 1901.....   | 545                     | 7,662                    | 1,203                     | 235                                | 13.8                           | 57.                                 | 43.8                                |
| 1902.....   | 375                     | 6,066                    | 1,024                     | 142                                | 16.8                           | 62.1                                | 37.8                                |
| 1903.....   | 337                     | 5,573                    | 1,060                     | 132                                | 19.02                          | 60.8                                | 39.1                                |
| 1904.....   | 322                     | 5,159                    | 891                       | 114                                | 17.4                           | 64.5                                | 35.4                                |
| 1905.....   | 529                     | 7,774                    | 1,179                     | 290                                | 15.1                           | 45.1                                | 54.8                                |
| 1906.....   | 733                     | 7,973                    | 891                       | 262                                | 13.8                           | 64.2                                | 35.7                                |
| 1907.....   | 402                     | 7,153                    | 950                       | 177                                | 13.2                           | 55.9                                | 44.1                                |
| 1908.....   | 501                     | 7,683                    | 1,037                     | 264                                | 14.6                           | 47.3                                | 52.6                                |
| 1909.....   | 731                     | 9,942                    | 1,440                     | 410                                | 14.4                           | 43.9                                | 51.8                                |
| 1910.....   | 1,085                   | 13,288                   | 1,810                     | 617                                | 13.6                           | 43.1                                | 50.8                                |
| 1911.....   | 622                     | 8,959                    | 911                       | 357                                | 11.3                           | 42.6                                | 57.4                                |
| Totals..... | 8,902                   | 120,309                  | 18,356                    | 4,117                              | *15.2                          | *53.7                               | *46.2                               |

\*Average percentage.

number in herds tested during the past sixteen years is 13. The percentage of cases of tuberculosis is known to run higher in large herds than in small herds. It is believed that careful, conscientious work is being done in testing cattle for herd owners in Pennsylvania. The owner, in most cases, desires to know positively to what extent the disease exists in his herd, and he willingly disposes of the ones condemned. Such work is generally done by the best veterinarians in the State.

The results are not so good on tests applied to cattle shipped in from other States. The law makes it compulsory to have all cattle brought into the State for dairy or breeding purposes physically examined and tuberculin tested. It is believed that tuberculosis is just as prevalent in other States where dairy cows are raised as it is in Pennsylvania. The tuberculin test has been applied to a much larger number of interstate cattle in Pennsylvania during the past year than on our own dairy cattle and the proportion of reacting cattle reported is only about one-tenth as great. The owner must pay for this test on interstate cattle, and it is a violation of the federal law to return or ship a reacting bovine animal from one State to another. Such condemned animals may be slaughtered under inspection, and if the meat is found fit it can be sold for food.

In case of interstate cattle the purchaser usually exercises all precautions that can be expected of a layman to avoid purchasing tuberculous animals. If he is a dealer, it is for his interest to get as many of his animals safely by the inspector as possible. In too many cases he dodges the law or gets the cheapest, and consequently the most unreliable, veterinarian possible to make the test. The veterinarian that stands firmly for principle and will do only reliable, honest work is not popular with dishonest dealers. Dairy-men should insist on tuberculin tests being applied by competent, reliable veterinarians when purchasing interstate cattle.

It must be admitted that good dealers can select tuberculosis free animals much better than the average breeder or dairyman can, yet it is doubtful if anyone, even a trained, competent veterinarian, can diagnose tuberculosis by a physical examination in

more than 25% of even animals that have reacted. A veterinarian does well if he can pick out by a physical examination the cases that are sufficiently far advanced to be condemned by a meat inspector after slaughter, and this represents only about 25% of the animals condemned by a tuberculin test.

Tuberculin testing and handling reacting cattle is not the only work done by the board in controlling tuberculosis in the State. Under the *Butchers' Indemnity Act*, the board is authorized to appraise and destroy the carcasses of animals having generalized tuberculosis, to prevent the meat from being sold for food. It is a misdemeanor for anyone in the State to sell or offer for sale meat from a case of generalized tuberculosis.

A good many dairy cows are condemned on physical examination, and they are appraised and destroyed under inspection. When a veterinarian reports a case of suspected generalized tuberculosis in a bovine animal, one of the meat hygiene agents is sent to see the animal. If he confirms the diagnosis, he is authorized to appraise and destroy it. The owner in such cases is advised, but is not compelled to have the balance of his herd tested with tuberculin.

During the last year the board was asked to take charge of milk hygiene work. This is done under Section 6 of the Act of Assembly (P. L. 91), approved May 21, 1895, and under Section 6 of the Act of March 30, 1905 (P. L. 78), which gives the board power to co-operate with local boards of health for the protection of the milk supply. It is the purpose of the board to adopt the same conservative and sane methods in the milk hygiene work as has characterized it in reference to handling the subject of tuberculin testing, meat hygiene, etc.

Considerable work has already been done in various parts of the State, and so far very little opposition has been encountered. The inspections are being made by local veterinarians. In the principal dairy sections the veterinarians in the counties have organized, each county having its own organization, and each member has been assigned a certain territory. In some cases the divisions are made by townships. The veterinarian agrees to inspect

the dairies in his district and report his findings to the board, and he receives seventy-five (75) cents for each report sent in. The board furnishes him with a blank form of report, similar to the one recommended last year by the commission appointed by the Mayor of Philadelphia to study the milk question in that city and report means for improving it.

The agent's report is rather lengthy and it takes considerable time to fill it out properly. The purpose of the present plan is educational. It is believed that it should be used until each inspector is familiar with the fifty-seven recommendations. The local associations are holding monthly meetings and discussing the various phases of the work, and whenever possible the board furnishes an experienced agent to attend these meetings and discuss milk hygienic work with them. Good progress is being made in placing the work on a uniform basis, and it may be best in the future to adopt a percentage score card similar to the one recommended by the federal government.

A perfect score indicates an *excellent* dairy, such as a first-class certified dairy. There are very few *excellent* dairies in the State at present, the principal reason why there are not more being due to the fact that such conditions cannot be provided at the popular prices at which milk must be sold. The next grade is *good*, and there is a large number of such dairies. In order that a dairy be graded *good* it must be known that an intelligent effort is being made to keep the herd free from tuberculosis and all other diseases, and that the man at the head of the dairy is intelligent and understands the dairy business. His cows are kept reasonably clean and a plentiful supply of wholesome care, food and water is provided. He must have a suitable place to store the milk on the farm and ample facilities for washing and cleansing the dairy utensils.

The next grade of dairies comprises the class known as *fair*. The manager of a dairy in this class may or may not be a believer in the tuberculin test; he conducts the dairy business as very much of a side issue to general farming or other business; his methods and facilities for storing milk on the farm, washing dairy utensils,

feeding, watering, bedding and grooming cows are not good, yet from his intelligence and appearance and the effort expended in his work it is not considered that he would permit the milk from known diseased cows to be used, nor would he allow, in any way, milk to be contaminated to a nauseating or dangerous extent.

The board has received reports on over ten thousand (10,000) dairies since the work was begun, and practically 10% of them are scored *bad*. Some agents mark closer than others, but the instructions are to mark dairies *bad* only where conditions are filthy or in such a condition that the public health is endangered in consuming the product. The principal defects that characterize such dairies as *bad* are the ignorance and carelessness shown on the part of the dairyman and his helpers. All dairymen have difficulty in obtaining efficient help. In *bad* dairies the work is principally done by the most illiterate, unreliable and inefficient class of laborers.

An agent is instructed to visit all dairies, both large and small, in his territory at least once each year where milk is sold for any purpose. One inspection each year is considered enough for those that are scored as *excellent* or *good*. More frequent inspections are to be made where conditions are *fair*, and we hope to visit dairies reported *bad* once each month.

In addition to the local agents, the board employs two or three competent, reliable men, who are paid by the month. They are known as traveling agents. These agents endeavor to visit, with the local agents, the *bad* dairies in each district. The purpose of the visit of the traveling agent is to see that an injustice has not been done the dairymen by scoring his place *bad*, and, if possible, persuade him to rectify the objectionable features. A few such dairymen are cleaning up and installing safer and better methods. Some have made improvements sufficient to place them in the *good* class.

There is a certain element among the dairymen of the State who are obstinate, too ignorant or too slovenly to be expected or trusted to do better or safer work, and it is with this class that trouble is anticipated. For the present it is proposed to use all

reasonable persuasion to clean up or clean out *bad* dairies. Intelligent dairymen, dealers and consumers can assist in this work. After the local agent has exhausted his resources in an effort to remove objectionable features, the traveling agent is requested to do what he can in a peaceable way.

If the traveling agent is satisfied that the dairy is *bad* and that the prospects for improvements are bad, the dealers, proprietors of butter or cheese factories, local boards of health and the consumers may be notified and requested to co-operate, and if the classification as *bad* is verified, assistance will be expected in disposing of the case in a just and satisfactory manner. Dealers and consumers should exercise all reasonable precautions to procure milk only from dairies that are managed by intelligent, trustworthy dairymen, who are equipped with healthy cattle, sanitary stables, wholesome food, healthy, efficient help and ample facilities for washing and cleansing dairy utensils, safely cooling and storing the milk while on the farm in a cool, sanitary place.

Radical changes or improvements should not be expected suddenly. It is hoped that those who are interested in placing the dairy business in the high and honored position that its worth justly merits will co-operate in bringing about necessary changes and thus eliminate, as much as possible, the objectionable features from the few who are the cause, at present, of so much unjust criticism on the many who are doing good work.

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W. L. HERBERT, V.M.D., York, Pa., has been elected to the City Council, and made chairman of the Sanitary Committee of said city.

DR. DAVID W. COCHRAN's report of the conference at Ithaca formed an interesting part of the programme at the February meeting of the Veterinary Medical Association of New York City. Dr. Williams' lecture on sterility in cows, illustrated by lantern slides, was an interesting and instructive feature. Dr. Fish's address on "Bob Veal" also aroused considerable interest, and Dr. Adams, of Philadelphia, captivated his audience by the clearness with which he described methods of diagnosing lameness.

## ARSENICAL POISONING FROM SMELTER SMOKE IN THE DEER LODGE VALLEY, MONTANA.

BY D. E. SALMON, D.V.M., MONTEVIDEO, URUGUAY.

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V.—(*Continued from February Issue.*)

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*The Question of Increased Tolerance of Arsenic.*—We are naturally led to ask, from the preceding observations, if animals do not become accustomed to arsenic, by ingesting it constantly, so that, like the arsenic eaters of Austria, they can absorb without injury a dose that would be dangerous or fatal to similar animals that had not previously been subjected to the influence of the poison. This is a very interesting and pertinent question, and it is well worth studying. Unfortunately, our knowledge of the arsenic eaters is not altogether definite and reliable. Tschudi, in 1851, reported that the mountaineers of certain districts of Austria took arsenic to increase their vigor and strength, to aid their respiration, and to make them feel lighter when ascending the mountains. Some thought it increased their genital powers. The women took it to improve their complexions. At the beginning of the arsenical treatment, they did not take more than about 2 centigrams (0.309 grain) of arsenious acid per week, but increased the dose progressively until they reached 20 centigrams to a gram (3.09 to 15.45 grains) per week. It was reported that one man took 15 to 20 centigrams (2.32 to 3.09 grains) daily. Knapp says that two of these arsenic eaters were presented to the Medical Congress of Gratz, in 1875, and swallowed before the members of the congress, one of them 40

centigrams (6.18 grains) of arsenious acid, the other 30 centigrams (4.63 grains) of orpiment.

P. Brouardel, (14) commenting on this, says these facts are surprising, and it would be interesting to be certain of the quality of the arsenic employed and the proportion of arsenious acid contained in the orpiment. He further says that this habit is not without danger, and refers to two deaths reported from acute arsenical poisoning, and to the statement of Marik and others that many of these arsenic eaters die victims of arsenical intoxication. Moreover, it appears from the report of a government commission that the dose ingested is generally less than 0.62 grain.

G. Brouardel (15) made a number of experiments with guinea pigs and rabbits, giving the arsenic by the stomach and by hypodermic injection. With some of the animals the doses were increased with irregular intervals; with others, moderate doses were given for a long time with regular intervals; with still others, the doses were increased irregularly. Among all of these animals, there were two guinea pigs only which were able to support a dose slightly larger than the fatal dose for animals of the same species and weight which had not before taken the poison. These two had received the arsenic by way of the stomach. The fatal dose for normal guinea pigs, administered in this way, was 2 to 3 milligrams per 100 grams of body weight, and these two were able to support 3.5 milligrams per 100 grams. None of the others presented the least degree of accustomance, but, on the contrary, succumbed to doses which were below the minimum doses for untreated animals of the same species. This increased susceptibility he attributes to the storing up of arsenic in the body.

Experiments made by the writer with dogs confirm the results obtained by G. Brouardel with rabbits and guinea pigs. One of these experiments is so interesting that the details are given in a slightly condensed form, as follows:

*Record of Arsenical Treatment, Dog No. 1.*—Male dog, young and in good condition of flesh; weight 29 kilos; affected

with chorea of right foreleg. Injected subcutaneously with arsenic in neutral solution as shown below:

1910, September 12, 2 mg.; 13, 3 mg.; 14, 4 mg.; 15, 5 mg.; 16, 6 mg.; 17, 7 mg.; 20 (weight 28 kilos), 7 mg.; 21, 8 mg.; 22, 9 mg.; 23, 10 mg.; 24, 10 mg.; 25, 11 mg.; 26, 12 mg.; 27, 14 mg.; 28, 16 mg.; 29, 18 mg. (weight 29 kilos); 30, 20 mg.; October 1, 22 mg.; 2, 24 mg.; 3, 26 mg.; 4, 28 mg.; 5, 30 mg.; 6, 33 mg.; 7, 36 mg.; 8, 39 mg. (weight 29½ kilos); 9, 39 mg.

On date last mentioned, urine became cloudy, and this proved to be due to a considerable number of desquamated epithelial cells, diagnosed as superficial pavement epithelium. Appetite diminished. No albumin in the urine up to this time. The dose reached was equal to 1.32 mg. per kilo of body weight.

October 10, 42 mg. (urine normal); 11, 39 mg. (slight gastric disturbance and tendency to diarrhoea); 12, no injection, urine slightly turbid, turbidity due to minute oil droplets; 14, 33 mg. (weight 30 kilos); 18, 36 mg.; 19, 40 mg.; 20, 40 mg.; 21, 40 mg.; 24, 40 mg.; 26, 44 mg.; 27, 45 mg.; 29, 45 mg. (first appearance of albumin in urine, estimated at 1/6 gram per mille); 30, 45 mg.; 31, 50 mg. (weight 29 kilos).

November 1, 50 mg.; 3, 50 mg. (no albumin); 4, 55 mg.; 5, 60 mg.; 7, 65 mg.; 8, 72 mg.; 9, 78 mg.; 10, 84 mg.; 11, 90 mg.; 12, 96 mg.; 13, 78 mg. (animal not so lively as usual; œdematous swelling at lower margin of flank and under abdomen; trace of albumin in urine; local irritation from injections; 15, 84 mg. (slight salivation); 19, 72 mg.; 21, 72 mg.; 28, 72 mg.

December 6, 44 mg.; 9, 60 mg.; 12, 60 mg.; 13, 60 mg.; 14, 60 mg.; 15, 64 mg.; 19, 72 mg.; 21, 72 mg.; 22, 72 mg.; 23, 72 mg.; 24, 72 mg.; 26, 72 mg.; 27, 72 mg.; 28, 72 mg. (weight 27½ kilos).

1911, January 16, 75 mg.; 21, 75 mg.; 23, 80 mg.; 24, 80 mg.; 25, 80 mg.; 31, 80 mg.

The animal died three hours after the last-mentioned injection, with acute congestion of the abdominal organs, and especially of the liver and kidneys. The symptoms of chorea were only slightly improved during the course of the treatment.

The points which seem to be important in this experiment are:

1. The dog died after a dose of 80 milligrams, or 2.9 milligrams per kilo of body weight, there having been an interval of six days since the preceding dose.

2. A week previously he had taken three doses of 80 milligrams, on consecutive days, without serious general symptoms.

3. Nearly three months previously he had taken 84, 90, and 96 milligrams on consecutive days and survived, the last of these doses being equal to 3.3 milligrams per kilo.

It is evident, therefore, that this animal, instead of becoming more tolerant of the arsenic, really became more sensitive to it, as did the greater part of Brouardel's rabbits and guinea pigs.

It may be asked, however, if the gradual increase in the dose during the first two months did not accustom the animal to the poison and enable it to sustain a larger dose than would be possible under normal conditions. To elucidate this point, experiments made with dogs Nos. 2 and 5 will be briefly cited.

With Dog No. 2, weight 33 kilos, the injections were commenced October 14, with 36 mg., and were gradually increased, reaching 100 mg. November 13, which was the seventeenth injection. This dose caused very grave symptoms, and a repetition of the same quantity two days later (November 15) led to death on the following day. This animal would probably have recovered from the first dose of 100 mg., equivalent to 3 mg. per kilo body weight.

Dog No. 5, weight 44.75 kilos, was given as a first dose 112 mg., at a single injection. This was equivalent to 2.5 mg. per kilo. The symptoms were great dejection and dyspnoea, but no albumin appeared in the urine, and in five days the general condition was again good.

From these experiments, the writer is of the opinion that Dog No. 1 acquired little if any increase in his powers of resistance as a result of the treatment of the first two months, but being young and having active eliminating organs, he was able to take a somewhat larger dose than Nos. 2 and 5 without fatal

results. The difference was not sufficient, however, to have much significance, even if it were due to an acquired tolerance of the poison.

The fatal dose, as indicated by these experiments, is very close to that reached by Rouyer, who fixed it 2.5 mg. per kilo by intravenous injection. As it requires 30 to 40 per cent. more by subcutaneous injection to produce the same effect, Rouyer's results are equivalent to about 3.5 mg. per kilo by this method, or slightly more than the largest dose survived by Dog. No. 1 after two months of arsenical treatment. The results of Rouyer, therefore, confirm the opinion already expressed that this dog acquired no increased power of resistance by this long period of treatment with gradually increasing doses.

Launoy has also shown by experiments on guinea pigs that there is no real accustomance to arsenic so far as the tissues are concerned. According to Cloetta, if there appears to be accustomance to this poison among the inhabitants of the Tyrol, it is due to lack of absorption by the intestine, nearly all of the arsenic being rejected with the excrements. This also is the opinion of Porcher. (16)

The indications are that this change in the power of absorption, if it occurs at all, is only observed when  $As_2O_3$  is ingested in powder. This powder, as is well known, not only dissolves slowly, but is moistened by water with the greatest difficulty, as each minute particle seems to be surrounded by a gaseous atmosphere which makes the powder, though of greater specific gravity than water, float on the surface and refuse to either dissolve or form a paste. Sometimes, after boiling in carbonate of soda solution for an hour, a considerable part of the powder will be found on the surface of the solution, or running up the sides of the flask far above the level of the liquid.

It is undoubtedly this property of arsenic which makes the results of the administration of the drug in powder so irregular, and which permits of enormous doses being taken at times without any ill effects. If the poison is administered in solution, and, above all, if it is injected subcutaneously or intravenously, the

fatal dose is fairly constant, taking into consideration the species and the weight of the animal.

Flue dust and smoke dust are, however, very different substances from arsenic trioxid. The samples of flue dust examined by the writer consisted of a dark gray powder which immediately forms a paste with water, with the simultaneous disengagement of considerable gas, and the paste having a strong acid reaction. The dust collected from the hay in the Deer Lodge Valley also immediately formed a paste with water. With neither the flue dust nor the hay dust was there anything in the physical properties to form an obstacle to the solution of the arsenic contained therein, which had any resemblance to the property of white arsenic just described that keeps water from coming into direct contact with it.

The writer is of the opinion, from his observations, that there was little, if any, of the so-called tolerance to arsenic manifested by the animals of the Deer Lodge Valley. The arsenic seemed to be freely absorbed from the intestines, and there was an evident accumulation in the tissues, sometimes reaching an extraordinary quantity.

The continued sensitiveness to arsenic and its accumulation in the tissues in great quantity may at first thought seem to involve a contradiction, but it must be remembered that the most serious effects of arsenic are due to its action on the nervous system and on the eliminating organs. According to Besredka, the minimum fatal dose, when injected directly into the brain of rabbits, is one hundred times less than when injected subcutaneously, while the symptoms and lesions were the same in the two cases; that is, there were diarrhœa and gastric, hepatic and renal lesions.

According to the same observer, when the poison is injected subcutaneously or intraperitoneally, it is taken up by the leucocytes and transformed into a non-toxic compound, which is eliminated before it reaches the nerve cells, and intoxication is only produced when the quantity of poison is so great that the leucocytes are unable to absorb it all. (17)

Whether this theory is, or is not, in all respects correct, the conclusion reached from a review of the various observations herein cited is that, when arsenic is absorbed in repeated doses, it enters into organic compounds which are relatively non-toxic, and in this form may accumulate and remain for a considerable period in the liver, kidneys, muscles, bones, etc. That if the doses are long-continued, or are increased in quantity, a point is reached in the accumulation at which local irritation is produced; and as, sooner or later, the accumulation must necessarily reach its maximum and the excretion equal the intake, there will at that time be the greatest quantity of free arsenic circulating in the blood, with the greatest probability of causing intoxication of the nervous system and irritation or inflammation of the eliminating organs through which the arsenic passes, as the kidneys, the liver, the intestines, the lungs, etc. That animals in which such accumulation has taken place are, in the great majority of cases, killed by an equal dose, or even a smaller dose, than is fatal for an animal of the same species and weight which has not previously been under the influence of arsenic.

While, therefore, the Deer Lodge Valley animals certainly ingested arsenic daily for long periods of time and had considerable quantities stored up in their organs, the writer is of the opinion, from his observations made in the valley, from his experiments made while he was there and subsequently, and from the literature which he has consulted, that very few of these animals possessed any acquired tolerance towards this poison or were, from any cause, able to withstand a larger dose than they could have withstood if they had not previously ingested the poison. There were probably a much larger number with diminished resisting powers, so that, in general, the animals became more susceptible, rather than more resistant.

#### ACCUMULATION OF COPPER IN THE TISSUES.

In addition to the accumulation of arsenic, there was apparently a much greater accumulation of copper in the tissues

of the Deer Lodge Valley animals. The first accurate information the writer had of this fact came through a verbal communication of Prof. John Marshall, who analyzed a few specimens of organs from these animals and found them heavily loaded with copper.

Harkins and Swain determined the quantity of copper in three specimens, as follows(18):

*Quantity of Copper Found in Animal Tissues from Deer Lodge Valley.*

| Description of Specimen.             | Miles<br>from<br>Smelter. | Copper,<br>Parts Per<br>Million. |
|--------------------------------------|---------------------------|----------------------------------|
| Liver of cow.....                    | 3 S.E                     | 88                               |
| Green fat from shoulder of colt..... | 2 S.                      | 288                              |
| Liver of sheep.....                  | 8 N.                      | 592                              |

No experiments were made to determine what effect such quantities of copper in the tissues would have upon the health of the animals, but that it would have a deleterious action and diminish the power of resistance to arsenic seems probable. The arsenic being the principal toxic agent, however, and the time for investigations being limited, the chemical work was mostly directed with the object of determining the quantity of this poison in the food and in the animal tissues: but it would be interesting, nevertheless, to know more of the part, if any, played by the copper in aiding the development of the symptoms and lesions observed in the animals of the valley.

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17. Brouardel, P., *Loc. cit.*, p. 150.
18. Harkins, W. D., and Swain, R. E. *The Chronic Arsenical Poisoning of Herbivorous Animals*, *Loc. cit.*, p. 932.

DR. C. J. MARSHALL UNDERGOES OPERATION.—Veterinarians throughout the country will be glad to learn that Secretary Marshall, of the American Veterinary Medical Association, is doing nicely after an operation for appendicitis, which was performed January 23. Dr. Marshall was dismissed from the University Hospital, Philadelphia, February 6, and two days later left with Mrs. Marshall for Jamaica, West Indies, where they will remain until the doctor regains his usual good form.

DR. J. H. McNEIL, professor of surgery and obstetrics, Ohio State University-College of Veterinary Medicine, has accepted a position in Brazil as Chief Veterinarian for the Brazil Land, Cattle and Packing Company, with headquarters at Sao Paulo, Brazil; for which place he sails about March 1. We are sorry the good doctor cannot stay and help us fight out the army veterinary bill question with Congress, but wish him "God speed" toward his new field of activity and usefulness just the same.

A POLICE DOG of the New York City force has recently demonstrated his usefulness by saving eight people who were caught in an ice flöe in the Long Island Sound and their little gasoline boat was in imminent danger of being crushed to splinters as the ice wedged tighter about it. The dog carried a line from the police patrol boat to the party in the gasoline craft and placed it in the hand of one of the men. The dog crossed on the floating ice that prevented the police boat from getting up to the party in distress. A man would have courted death had he attempted to do what the dog did with apparent ease.

## SOME OF THE FEATURES OF SANITARY POLICE WORK AS APPLIED IN THE FEDERAL QUARANTINE SERVICE.\*

BY R. N. HICKMAN, CHIEF OF QUARANTINE DIVISION, B. A. I., WASHINGTON,  
D. C.

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*(Continued from February Issue.)*

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The cattle were shipped from Bombay April 27 for Hamburg, where they were transshipped on June 2, arriving at New York on June 16, where I made their acquaintance, being at the steamer dock to receive them and supervise their transfer to a special place of quarantine which had been prepared at a point about 16 miles down the bay, known as Simonson's Island, quite an isolated spot adjoining Staten Island, located on the Fresh Mills, an estuary of Staten Island Sound, and separated from Staten Island by ditches and wide salt marshes, subject to overflow. Beside the blood examinations at Poona, two additional microscopical examinations of their blood were made during the ocean voyage, the presence of the surra trypanosome was not detected, and the cattle all arrived in apparently sound health. Notwithstanding which, and the blood examinations, two at Poona and two en voyage, it was deemed advisable to make blood inoculations, which was done under the direction of Dr. Mohler, a report of which is published in the Twenty-Sixth Annual Report of the Bureau. It was found, as a result of the first inoculations with the blood, from the 49 adult cattle, that three animals were infected. The seriousness of the situation from the owner's standpoint will be apparent, as the zebus were tied on two sides of an open corral, 100 feet square, without means to protect any of

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

them from the various kinds of biting flies, which were present in great numbers, including the *Tabanus atratus*, the big black horse fly or breeze fly, the green head horse flies (*Tabanus lineata*, *Tabanus costalis*), and the *Stomoxys calcitrans*, the former of which, however (*Tabanus atratus*), Dr. Mohler believes to be responsible for spreading the infection to other animals. These exhibited a predilection for the hump, and two or three of these big black horse flies would be seen on a hump at the same time. Upon discovery of surra in the herd, I made another trip to New York, met Mr. Borden, and, with the superintendent of the animal quarantine station for the port of New York, and Dr. Wm. Thompson, proceeded to purchase the cotton netting, the combined stock of two department stores, took it to Simonson's Island, and having difficulty to get carpenters on short notice, went to work with such help as could be hired, in putting up an "L" shaped frame with netting cover, completely closing in the two sides of the corral. It was deemed necessary, however, in order to absolutely determine and limit the extent of the infection, to put up a frame building with box stalls, so that each animal could be screened off separately, which the importer did, with the result that after the last seven series of tests were successfully negative, and as killing frosts had occurred, the remaining animals, 33 in number, were released from their five months' quarantine on November 14, and shipped to their destination in Texas, 18 out of the original herd having been destroyed because of surra infection.

This importation of India cattle probably contained the finest specimens of the respective breeds ever brought to America. Their size and general appearance was a surprise to everyone who had only seen the small specimens such as are usually exhibited at menageries and zoological gardens. Dr. Thompson is shown, in the Annual Report, beside one of the bulls, whose hump is as high as the top of his hat. This bull measured six feet in height, that is, to the top of his hump, and weighed 1,860 pounds, while the menagerie zebu weighs about 250 to 300 pounds, and measures not higher than three feet.

As another concrete example of the efficiency of the Federal quarantine, in its sanitary police service, I desire to briefly refer to an importation made in 1905, after a broad investigation of the subject in the interest of the milch goat industry, consisting of 65 head of goats, 4 males and 61 females, from the Island of Malta. Quite a complete history of this importation, by Dr. John R. Mohler, and Dr. Geo. H. Hart, his assistant in bacteriology at that time, is published in the Twenty-Fifth Annual Report of the Bureau. The article contains a description of the Maltese goat, its adaptation for breeding and milk production, and of the investigations and results leading to and following the discovery in their milk and urine of the *Micrococcus Melitensis*, the causative agent of Malta fever. These investigators concluded that the organism of Malta fever lives a more or less passive existence in the body of the goat, exercising its pathogenic effect when it gains entrance to the human body. Blood examinations in the case of both goats and kids were made from time to time. On October 17, 1906, seventeen remaining adults were again tested, and two of the eight which, on June 1st, gave an imperfect reaction now gave a positive reaction, consequently, after due consideration, it was decided that the only safe course rested in the destruction of them all, including their progeny, which was done. Thus while the parties interested in the Maltese goat enterprise completely failed in securing the coveted breeding stock, and were far less fortunate than in the case of the Brahman cattle importation, the extinction of the goats accomplished the devoutly to be desired object, in view of the circumstances, namely, the extinction of the *Micrococcus Melitensis*, without its having gotten out of quarantine.

The usual period of quarantine for cattle imported from Great Britain, Ireland, and the Channel Islands, is thirty days, counting from the date of arrival at the quarantine station. For cattle from other countries, except North America, it would be ninety days counting from the date of shipment, or date of clearance of the vessel.

Sheep, and other ruminants, and swine, except from North

America, are subject to a quarantine of 15 days, counting from the date of the arrival at the quarantine station. All dairy and breeding cattle are required to pass a satisfactory tuberculin test. Those from Europe, by a Bureau inspector stationed in England. In the case of dairy and breeding cattle from Canada, a tuberculin test certificate by an authorized Canadian official veterinarian is satisfactory to the United States government.

Menagerie ruminants from countries in which surra exists, as well as other kinds of menagerie animals, when it is thought necessary, are subjected to blood tests by rabbit inoculations. Horses from any part of the world except Asia and Africa are permitted entry on passing a satisfactory inspection at the port of entry.

Dogs, except from North America, are subject to inspection at the port of entry. Collie, shepherd, or sheep dogs are subject to quarantine, not to exceed two weeks, or until it can be determined by proper examination whether or not they are the hosts of the *Taenia coenurus*. Horses, asses, mules, sheep, goats, and swine from Asia and Africa, on account of the trypanosomes, are prohibited by B. A. I. Order 174. Cattle are not included in this order for the reason that Section 12 of the Act of Congress of 1909 prohibits the importation of neat cattle, unless or until the operation of such prohibition shall have been suspended as to any foreign country or countries by the Secretary of the Treasury, who must officially determine and give public notice thereof. This was a re-enactment of the old law, which permitted of importations of cattle only on proclamation of the President, but transferring the authority to the Secretary of the Treasury, which is exercised upon recommendation of the Secretary of Agriculture, in accordance with which Treasury Department Circular, issued October 20, 1909, provides for the suspension of the operation of this section of the law as applying to cattle from the countries of Great Britain, Ireland, the Channel Islands, and North America, including Mexico.

The diseases which probably cause most annoyance in quar-

antine are necrobacillosis, foot rot in sheep, and infectious diarrhoea of young calves, which become manifest on shipboard or after arrival at the quarantine station. I think it can be said, however, without any qualification whatever, that the proper and satisfactory handling of the work in connection with the importation of hides and skins from a majority of the various foreign countries of the world is the most difficult problem with which the sanitary police service of the Bureau of Animal Industry has to deal. The importation of hides is subject to the same law, that is to say, Section 12 of the Tariff Act of August 5, 1909, as provides for the importation of cattle, and to regulations issued by the Secretary of the Treasury, on recommendation of the Secretary of Agriculture. The regulations now in effect are known as Treasury Department Circular No. 23, Division of Customs, dated May 2, 1910, entitled, "Disinfection of Hides." In order to state the matter concisely, I will just explain that the methods of disinfection are prescribed as follows:

1. By immersion in a 1-to-1,000 solution of bichloride of mercury.
2. By immersion in a 5 per cent. solution of carbolic acid.
3. By exposure (suspended separately in a tight room) to sulphur dioxide.

Exceptions are made in the disinfection requirements in the case of:

1. Hides, the product of, and imported from any part of North America.
2. Hard, sun-dried hides, also, old and worn-out articles of manufacture made from raw hides, such as loom pickers and mallet heads, imported as glue stock.
3. Hides and hide cuttings and parings, or glue stock, which have been lime dried after soaking for forty days in a strong lime wash made by slaking quicklime in water, and containing sufficient lime to be of a creamy consistency.
4. Abattoir hides, the product of Sweden, Norway, New Zealand, Australia, or Great Britain, when accompanied by a certificate of an official veterinarian showing that the same were

taken from cattle free from disease at the time of their slaughter.

5. Hides taken from American cattle killed in lairages in Great Britain.

While in the case of all hides offered for shipment from districts of any country in which anthrax is prevalent, disinfection by immersion for at least 30 minutes in a 1-to-1,000 solution of bichloride of mercury only is permitted, and certificates of disinfection, by the consular officer of the district from which shipped, are required, otherwise they are treated as prohibited importations and denied entry. Also as the disinfection of such on the dock of the importing vessel, upon arrival in this country, or their entry for transportation to another country across American territory, is not permitted, for the reason that the landing of diseased hides would tend to the dissemination of cattle diseases, it will be observed that when vessels arrive from foreign countries, with hides on board, which do not belong to the excepted classes, and are unaccompanied by proper consular certification, there is no alternative but for the inspector to see that such hides remain on the vessel and depart with her at the time of her scheduled sailing, which, of course, is not agreeable to either the consignor or the consignee.

Owing to the hide output of the big slaughterers and packers in the United States being now to a great extent tanned in their own establishments, the owners of exclusively tanning establishments state that they are absolutely dependent upon foreign importations to keep their tanneries in operation, and that in consequence of the common prevalence of anthrax in some portion or portions of the hide exporting countries, and the strict enforcement of our sanitary regulations, they are utterly unable at times to procure the necessary stock. A very considerable amount of attention and investigation has been directed to the matter of discovering a practicable method of anthrax sterilization as affecting hides, skins, hair, and wool, without yet having reached a satisfactory solution of this intricate problem. It is claimed by the tanners that the requirements of our sanitary regulations are equivalent to prohibition, since by the immersion of

either green-salted or sun-dried hides for 30 minutes in a 1-to-1,000 solution of bichloride of mercury, they are seriously injured for the manufacture of leather, and the experiments of the Bureau in this connection would indicate that such is the case, and particularly so as applying to the hard-dried hides, which latter the British reports show to be much more frequently than green or pickled hides and skins the source of anthrax infection among the handlers and workers.

It has been arranged during the past year, through the State Department, and its consular service, for the prompt transmission of information by the Bureau of Animal Industry to the tanning and leather associations of the United States regarding the prevalence of anthrax in a consular district, in order that the trade may in turn notify their foreign buyers and stop purchases. But to satisfactorily meet the requirements of the situation something more than this is needed. In all tropical and semi-tropical countries, such as India, China, Africa, and South America, skins are dried either in the sun or in a shaded air current, or are plastered over with an earth salt while drying. The restoration of all such hides to the green, raw, or wet state has always been a source of difficulty and loss to the tanner.

Hides, skins, as well as hair and wool, are at present, I believe, admitted into Great Britain without disinfection or sanitary supervision, especial attention being directed to the posting of hide cellars, factories, and wool sorting rooms, with printed instructions in the working and handling of these materials as related to the avoidance of anthrax infection, together with its characteristic appearances in the human subject, by means of pictures to aid in its recognition, and to the importance of promptly applying to a designated source for skilled treatment at the first appearance of symptoms.

During the latter part of last winter the Bureau received from the American consul at Bradford, England, the Fifth Annual Report of the Anthrax Investigation Board for Bradford and district, for the year ending October 31, 1910. In his letter of transmittal, the American consul stated that Dr. F. W. Eurich,

the Bacteriologist of the Anthrax Board, was experimenting with a discovery recently made by Mr. Alfred Seymour-Jones. At about the same time the Bureau received a booklet from Mr. Alfred Seymour-Jones, with the compliments of the author, in which he claimed to have solved the problem of sterilization of anthrax spores in hides, skins, hair, and wool, without injury to these articles; that on the contrary, his process was very efficacious in preserving hide substance, and that even hard, sun-dried hides could, after sterilization, be quickly restored to their former condition, while under previous methods which had been tried, dry hides and skins, in soaking back, were apt to lose a relatively large percentage of their weight, owing to the solution of the decomposed skin matter. In this process two pits are used, the first or sterilizing pit containing one per cent. of formic acid of 90 per cent. strength, and one part of mercuric chloride to every 5,000 parts of water. In this pit the hides are left 24 hours, taken out and drained, and placed in the second pit, containing a saturated solution of common salt in water, with a good layer of undissolved salt lying on the bottom of the pit. In this pit the hides need not be left more than an hour, when they are hauled up and placed on a drainer, the drainers of both pits being so arranged that the solutions run back into their respective pits for further use. The treated hides may be opened out, flesh side up, and dry salted, and then placed in a pile for a few days before baling, or they may be again dried.

The statements in the Seymour-Jones booklet are to the effect that the formic acid alone does not sterilize the anthrax spore; that the dried hide absorbs the bichloride under the influence of the formic acid present in the bath, while in the case of the bichloride solution alone neither the blood clot on the surface of the hide, nor the hide substance, are penetrated by the bichloride. Also, that the formic acid being very readily absorbed by colloidal albuminoid substances, blood, gelatine, or hides; that it, by its presence in the sterilizing dip (as shown by treating hides with a dilute formic acid solution) renders the hide capable of satisfactory salting or re-salting, as it will readily

absorb salt, if after treatment with the formic acid solution, it is subjected to soaking in saturated salt solution, or to dry salting. So as this treatment is inexpensive, it will be seen that should it be found as represented, it would appear to be almost ideal.

In view of the work that is being done by the Anthrax Investigation Board for Bradford and district, and the investigations which are in progress elsewhere in connection with anthrax sterilization, and the quantities of anthrax bearing materials which are offered for export, it is hoped that some practicable process for general adoption will soon be solved. I might add that it has been stated also that sufficient evidence has been collected to warrant the supposition that animal food stuffs imported into Great Britain receive contagion in shipping, from association with hides, skins, wool, and hair; therefore it would seem probable that nearly all of the agricultural risk from anthrax can be eliminated if animal food stuffs are not placed in the neighborhood of such materials until after thorough treatment of the infected material at the port of shipment, by means of some practicable and efficient sterilizing process.

I am pleased, in conclusion, gentlemen, to invite your attention to the favorable conditions which now exist and which have been in operation during the past several years as a result of the mutuality of interests, the unity of effort, and the reciprocal relations which unite the two great animal industry organizations of this continent, so ably directed by the two preceding presidents of this association. As we contemplate these conditions and circumstances, we are inspired with confidence for the future, and feel justly and reasonably proud not only of our accomplishments, but likewise of our rank and standing among the nations of the world in matters pertaining to animal industry, and sanitary control as related to the contagious diseases of live stock.

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DR. CHARLES H. LEAVITT, Vancouver, Wash., has returned to Manila, P. I.

## ANTHRAX AND TICK FEVER.\*

BY W. H. DALRYMPLE; BATON ROUGE, LA.

(Of Committee on Veterinary Sanitary Police Measures).

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(Continued from February Issue.)

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TICK FEVER.—The successful eradication of the common cattle tick from the Southern States, which, necessarily, means more than the suppression of tick fever, is, in my opinion, one of, if not the most important industrial problem confronting that section of our country to-day—for, assuredly, a tick-free South means a new South, agriculturally.

It may interest some of you, at least, to know something of the losses the South has sustained from the presence of the common cattle tick (*Margaropus annulatus*).

Various estimates have been placed upon these losses, and in the Year Book of the United States Department of Agriculture for 1904 they were given at no less than \$100,000,000 annually.

A citizen of my own state, the late Mr. August Mayer, pointed out, in Farmers' Bulletin of the Federal Department of Agriculture, No. 261, that the *direct* loss to the South each year, occasioned by the cattle tick, was not less than \$46,500,000; this loss consisting of the death of cattle from excessive tick-infestation and from Texas or tick fever; and the loss in flesh by both beef and dairy cattle due to the drain upon them by the tick.

In addition to this direct loss, Mr. Mayer also pointed out that the *indirect* loss occasioned by the greater length of time required for cattle to mature when the tick had to be contended with, and the failure of Southern cattle to even approximate the average valuation of cattle in the tick-free states, amounted to the additional sum of \$84,000,000 a year.

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

In short, the losses chargeable to the presence of the cattle tick in the South, Mr. Mayer roughly summarized as follows:

1. Death from tick fever of pure-bred cattle imported from the North for breeding purposes.

2. Death from tick fever when cattle raised in isolated tick-free areas were unintentionally, or accidentally, placed with ticky cattle, or on tick-infested areas.

3. Death of native cattle from excessive parasitism and fever occasioned by the ticks.

4. Universal loss of weight by all tick-infested cattle, and their failure to gain flesh at a rate great enough to make beef production profitable (to this might have been added, decrease in the production of milk in dairy cattle).

5. The lower price which Southern cattle brought upon the market, regardless of how perfect their condition might be.

6. Sterility induced in high-grade cattle by tick-infestation.

7. The expense of maintaining a Federal quarantine line for the protection of the North against invasion by the tick, and the added expense of maintaining quarantine pens for Southern cattle shipped North for slaughter.

8. The discouraging effect on the breeding of pure-bred cattle in the South by reason of Southern breeders not being allowed to exhibit in Northern show rings. And,

9—But by no means least, the potential loss of fertility of Southern farm lands, due to a one-crop system (cotton) which, with the tick eradicated, would quickly give way to a diversified agriculture, which would conserve and increase the fertility of Southern soils.

From the foregoing summary, I do not think it would require a very great stretch of the imagination to fully appreciate the apparently enormous figures representing the amount of money which the South has been paying tribute to the cattle tick, annually, for lo! these many years. Nor should it be difficult to realize that, in lending its valuable effort towards the ultimate extermination of this pest, and with it the deadly bovine tick fever, the Federal Government has undertaken to assist in one

of the most benign and important pieces of industrial work for the South, and, incidentally, for other sections of the country, that is possible of conjecture.

A very brief history of the beginnings of the tick eradication work in the South may be of interest:

Following a conference of Southern gentlemen interested in this movement, including some of the most prominent members of the profession in the South, with representatives of the National Bureau of Animal Industry, it was decided to take the matter up with Southern senators and representatives in Washington with the view of obtaining Federal aid through Congressional appropriation.

Subsequently, in the spring of 1906, a measure was introduced by Congressman Joseph E. Ransdell, of Louisiana, carrying an appropriation of \$100,000 for tick eradication.

During the committee stage of the proceedings however, a hearing before the House Committee on Agriculture had been arranged by Mr. Ransdell in behalf of the measure, and at which were present Secretary Wilson himself, Dr. A. D. Melvin, and others of the Bureau of Animal Industry, a number of delegates from the Southern States, and several interested members of the Senate and House.

Suffice it to say that the appeals, as a whole, made in behalf of the measure were so forceful and convincing that the amount asked for was recommended by the committee, and \$100,000 obtained for this work—or, more correctly, \$82,500, the remainder going to another bureau more or less allied with the project.

The second appropriation amounted to \$150,000, and the annual appropriation since then has been \$250,000.

These moneys have been appropriated on the "help those who help themselves" basis. That is to say, it was most emphatically stated by the Chairman of the Committee on Agriculture that only those tick-infested Southern States which showed a desire to help themselves would receive assistance from the national Department of Agriculture, which the Congressional appropriation made possible—this assistance taking the form of

veterinary inspectors of the Bureau of Animal Industry; and the extent of this aid hypothecated on the amount of state or other local effort put forth.

Since this work commenced co-operatively, by the Bureau of Animal Industry and those states which showed a willingness, or were prepared to undertake their share, over 143,000 square miles of previously infested Southern territory have been absolutely freed of cattle ticks and placed above the Federal quarantine line. And this, notwithstanding the cruder methods adopted, and in spite of much unreasonable, but natural, opposition to the work in its initial stages. In the face of all the drawbacks, however, and in spite of the "pullbacks" in human form, that such an extensive area should have been cleared of these expensive pests in the comparatively short space of time, since the inauguration of the work, constitutes nothing short of a splendid record, even if it has cost the Federal Government in the neighborhood of a million of dollars to date. In fact, I think it questionable if a similar amount of money could have been spent in any other cause that will yield such returns, not only to the South but to the country at large, in the years to come. And, while we are glad to be able to send some of our best Western farmers over the border to help our Canadian friends out, the eradication of the cattle tick from the South will open up to general agriculture and stock raising the most promising section of our own country to this desirable class of citizenry, and thereby tend to retain them under the fluttering folds of "Old Glory," instead of under those of the "Union Jack." Although, Mr. Chairman, from the splendid protection this latter "old rag" affords the world-wide citizenship over which it floats, it is by no means to be despised.

But although the progress already made in tick eradication is most encouraging, later methods, and the experience gained in the past, will hasten very materially the completion of the work, and to which I will briefly allude before I close.

Mr. Chairman, the problem of tick fever simply resolves itself down to the proposition of killing cattle ticks. We seem

to care little now about the theoretical side of this disease, but are rather bending our efforts toward the total extermination of one of the obligate hosts of the organism which produces it, and thereby make impossible the completion of the cycle of its existence. And we are going to win!

Before referring to the later methods adopted in the campaign, it may be of interest to some of the members present to say just a word concerning the active cause of this fever and its parasitic host—the common cattle tick: Tick fever is, in reality, a piroplasmosis, and is brought about by a two-host protozoan, the *Piroplasma bigeminum*. This organism requires, for the completion of its life-cycle, two hosts, which are, in its case, the bovine animal and, in this country at least, the common cattle tick (*Margaropus annulatus*).

In some other countries other names are applied to the disease, such as bovine malaria, red-water, etc., and other species of ticks may act the part of second host.

But in no case, so far as we know, will the organism complete its development in the absence of one or other of its hosts—they are obligate.

Consequently, in order to prevent completion of the life-cycle of this organism, we destroy one of its obligate hosts, which, as may be inferred, is, in our case, the common cattle tick.

So that in short, our object in killing cattle ticks is not only to break the life-cycle of the protozoan, but prevent the fever by destroying the host which, in the seed-tick stage, transmits it to the bovine.

I believe I am correct in the statement that the common cattle tick is the only one, in this country, at all events, which completes its development on the body of its host after it attaches itself in the seed-tick stage; molting twice, and going through the process of fertilization during that period.

In the Gulf States, at least, the period from the time the seed tick attaches to its host until the engorged and fertilized female drops to the ground to deposit her eggs, is, on an average, 22 days.

The eggs deposited may be from 1,500 to 4,500, or more, after which the mother-tick dies.

In midsummer the eggs hatch in from 17 or 18 to 30 days, and the seed-ticks almost immediately crawl up the nearest weed or blade of grass and bunch together near the top, where they await the first passing animal; and where the development on the host, as stated, commences. In 22 days the female, fertilized and engorged with blood, drops to the ground for egg deposition; and this continues, in the case of millions of these parasites, all during the summer season.

In cold weather the eggs do not hatch, but usually remain over until the coming of the warm days of spring.

The above is but a very brief life-history of the cattle tick, which I have given in order that you might more readily appreciate the application of what I have termed the later methods in the work of eradication. These are—the concrete dipping vat; the standard arsenical dipping solution, composed of common white arsenic, ordinary sodium carbonate, pine tar, and water; and the dipping of the cattle regularly every 21 days (some dip every two weeks).

The method is not only eminently effective, but simplicity itself. The cattle themselves gather the ticks from the pasture, and every 21 days during the summer months bring them to the dipping-vat to be killed by the arsenical solution. The 21-day dipping periods insure that none of the large female ticks will have dropped from the cattle to the ground to make more seed-ticks, which they would do if left for 22 days or over, but all that have accumulated on the animal, between dippings, are brought to the vat to be destroyed.

In this way the pasture is ultimately cleaned of ticks, and the number on the animal much reduced at each dipping, until they are exterminated from the place.

Incidentally it might be mentioned here that not only does the dipping process effectually kill cattle ticks, but millions of those miserable little irritating horn-flies are destroyed in the solution; and it is the experience of those who have been using

the dipping vat for some time that where cattle are dipped regularly, "warbles," or "wolves," in their backs are almost unknown, which means a considerable saving in the value of hides, and the leather made from them.

The dipping vat has made many converts to the work and brought about co-operation, rather than opposition which previous methods such as hand-greasing of the cattle, laying pastures out of commission in order to kill ticks by the starvation process, etc., had created in those who could not appreciate the benefits to be had from tick-freedom, and who never had had any means of comparison between what then obtained and that which might be brought about, if only the ticks were gone.

In my own immediate neighborhood, comprising three parishes, or counties, the work has taken an almost unprecedented spurt; 30 or 40, probably more, vats having been constructed, solely at individual expense, and for the benefit of the neighbors as well as the individuals owning them. Dipping is going on regularly; vats are now considered a permanent necessity on the farm for all kinds of live stock, and the destruction of the external parasites that prey upon them. The benefits are so apparent, even after two or three dippings, that the thing is becoming contagious among the people. They talk about the dipping vat; tell their neighbors about it; praise its good work on every available occasion. In short, are simply delighted with the results. And that, too, in the particular instance I speak of, without any monetary assistance from either local or state authority.

The movement was started in a voluntary way. No one was required to dip, and no restrictions were placed on the movement of cattle. Several of our more intelligent cattle owners simply acted upon our suggestion, after a little campaigning, and built vats. Others either followed suit, or took advantage of those vats already constructed. Invitations were sent out by the owners of vats to the neighbors to come and witness a dipping demonstration. It did not take many of such demonstrations to prove to them the effectiveness of the process.

In the neighborhood of the vats all opposition has melted away, and the "standbacks" on the outside are gradually losing their native inherent opposition to things progressive and are falling into line. And, as the result of what has already been accomplished in my immediate vicinity, and solely by individual effort and expense on the part of a number of cattle owners themselves since about the middle of May last, we have been able to obtain the assignment of an experienced veterinary inspector of the Bureau of Animal Industry to assist and encourage our people in a work which means so much to them, and to the whole South, in an agricultural and industrial way.

Finally, Mr. Chairman, for my paper is already much too long, this work of tick eradication, and along with it the deadly tick fever, from the South is no longer looked upon as merely cleaning a cow of ticks in the interest of the individual cow owner. It is already being considered a great commercial proposition.

The big transportation corporations of the country doing business in the South have caught the slogan, "Get rid of the ticks," and are assisting the work by printing and distributing all along the Southern lines of their roads elaborately illustrated pamphlets on tick eradication. They have now come to realize that, in order to secure maximum business in the haulage of cattle and other live stock and farm products generally to and from a section of country so admirably adapted by nature, and in other respects for successful agriculture, in all of its branches, the tick must go! And, when these wealthy corporations fully appreciate the fact, viz., that the cattle tick in the South interferes with the size of their dividends, which, apparently, they have already done, then the tick has simply got to "get a move on"; "that's all their is to it."

It would seem, then, that in a very few years' time we will not only be able to keep our own citizens from crossing the northern border in search of a livelihood, but possibly tempt South some of our Canadian friends to help us develop one of the grandest agricultural and stock-raising sections of country on the American continent.

## THE IMPORTANCE OF HOG CHOLERA AND THE PRODUCTION OF HOG CHOLERA SERUM.\*

BY F. A. BOLSER, V.S., NEW CASTLE, IND.

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(Continued from February Issue.)

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TREATMENT AND PREVENTION.—There is no successful treatment for hogs sick with cholera. Various products have been recommended for this purpose but are of no practical value. The only rational way of dealing with an epizootic is to prevent the spread of the infection instead of attempting to cure those animals already sick. Since there can be no cholera without the filterable virus, every precaution should be taken to prevent its being carried to sound herds. After the disease has appeared in a herd, the only known remedy that will prevent its spread is the Dorset-Niles anti-hog cholera serum. This preparation will prevent the infection of other members of the herd if used in the early part of an epizootic. Besides administering serum, pens, troughs, and yards should be thoroughly cleaned and disinfected, so that the infection cannot be carried to other places.

PRODUCTION OF SERUM.—Since the filterable virus could not be grown artificially, it was necessary to resort to the blood of hogs sick with cholera for any protective agent. On this account many attempts were made to produce a vaccine at attenuating the blood of sick animals. The results attained by such attenuation were too uncertain for general use. While endeavoring to produce a vaccine, it was noticed that by injecting an immune animal with large amounts of virulent blood, a serum of high protective powers could be obtained.

In order to produce anti-hog cholera serum it is necessary to have an immune animal. For this purpose a pig is immunized

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

by inoculation with a few centimeters of virulent blood and an injection of anti-hog cholera serum in opposite sides of the body. Then the immune is hyperimmunized by the injection of virulent blood. The large amounts of virulent blood required are obtained as follows: A few centimeters of virulent blood are injected into susceptible pigs. When these animals are in the last stages of the disease, they are bled under antiseptic conditions, the blood defibrinated by shaking with glass beads, and strained through sterile gauze. To produce potent serum a strong virus is necessary, that is, one that kills quickly. Otherwise the serum produced would be weak in protective properties. We may hyperimmunize in any of the following ways:

1. Slow subcutaneous. Inject the immune animal subcutaneously with 1 c.c. per pound of body weight. In from seven to ten days repeat the injection using  $2\frac{1}{2}$  c.c. per pound. Then after the same interval inject 5 c.c. per pound.

2. Quick subcutaneous. Inject 10 c.c. per pound of body weight.

3. Inject intravenously 5 c.c. per pound.

4. Intra-abdominal. Inject intra-abdominally 10 c.c. per pound of body weight.

As soon as the animal has recovered from the effects of the injection or the last injection, if the slow subcutaneous method has been used, it is ready to begin bleeding from the tail. This is usually within ten days. The bleeding is repeated at intervals of a week for three or four weeks. The animal is then killed and all its blood used, or it may be rehyperimmunized. In rehyperimmunizing the animal usually receives half the previous dose of virulent blood. Four or five cubic centimeters of blood per pound of body weight are usually taken at each bleeding. Sometimes an animal will not bleed so much and occasionally it is possible to take more. A two hundred pound hog will in most cases give 800 to 1,000 c.c. of blood at each bleeding.

TREATMENT OF THE BLOOD.—The blood is drawn from the tail under as antiseptic condition as possible. It is then defibrinated or the clots broken up by shaking with glass beads, then

strained through sterile gauze to remove the clots. One half per cent. of phenol is added and the serum is ready for use. The blood of each animal is kept separate and that of each bleeding added. The mixed blood of several animals is tested before using.

TESTING THE SERUM.—The following methods of standardizing hog cholera virus and testing the potency of the serum were adopted at a conference of the Federal and State officials in December, 1909:

1. The standardization of hog cholera virus which is used for hyperimmunization.

A. Inject at least two pigs intramuscularly, giving each 2 c.c. of the defibrinated diseased blood which is to be tested. The blood should not be more than 24 hours old and should have been kept at a temperature not higher than 55° F.

B. The test pigs should not weigh less than 50 pounds each. After injection they should be placed in a small disinfected pen with at least one susceptible uninoculated pig of the same weight and preferably of the same litter.

C. The virus shall not be considered suitable for use unless the inoculated pigs become visibly ill within eight days and die within fifteen days after inoculation. The carcasses of these pigs must show undoubted lesions of hog cholera. Furthermore, the communicability of the disease induced by the blood inoculations must be demonstrated by the contraction of the disease by the check pig within 12 days after the appearance of the disease in the inoculated pigs.

2. Handling the blood used for hyperimmunization. The diseased blood should be collected and manipulated under strict antiseptic precautions, stored in a temperature not higher than 55° F. and used within 24 hours after drawing. It is recommended that defibrination be postponed until immediately before use of the blood.

3. Testing the potency of the hyperimmune serum.

A. If the plan of testing the mixed bleedings of each hy-

perimmune be adopted by the producer, then we recommend that the test be carried out as follows:

Inoculate three hogs, each weighing from 50 to 100 pounds, with 2 c.c. each of virulent blood. Inject two of these simultaneously with 15 c.c. each of the serum to be tested. If the hog receiving virulent blood only sickens with hog cholera within eight days and is apparently ready to die in fifteen days, while the two receiving immunized serum continue in good health, then the serum may be considered suitable for field use in doses of 20 c.c. for hogs weighing from 50 to 100 pounds.

B. If the plan of testing the mixed sera of several hyper-immunes be adopted by the producer, then inject intra-muscularly nine similar hogs weighing from 50 to 100 pounds each with 2 c.c. each of virulent blood. Give each of three of these 15 c.c. of the immunizing serum to be tested. Give each of three others 20 c.c. of the serum to be tested. If all of those receiving immunizing serum remain in good health and two or more of the checks become ill of cholera within eight days and are apparently going to die in fifteen days, the serum shall be considered suitable for field uses in doses of 20 c.c. for hogs weighing from 50 to 100 pounds. If one or more of the pigs receiving 20 c.c. each of the immunizing serum all continue to remain in good health, then the serum may be used in field work in increased doses.

**METHODS OF USING SERUM.**—There are two methods of using the serum. By the simultaneous method a dose of serum and a small amount of virulent blood are injected into the opposite sides of the body. This method of vaccination is said to produce an immunity that will last for life. It is to be preferred in cases of well herds and in those that will not be exposed to the disease for several months. This involves the use of virulent blood which if handled carelessly may furnish the source of infection to well herds.

Serum only is injected in the other method. This serum will produce an immunity that will last for several weeks or months, but if the animals are not exposed to cholera within a

few weeks after receiving the serum, the immunity is believed to be of a lasting duration. In either case the injection is usually made in the inside of the thigh. Where natural exposure to the infection takes place, the virus is not needed. The serum should be administered by a competent veterinarian under strict antiseptic precautions.

Our experience in eighteen months with Dorset-Niles method of serum treatment in treating hogs affected and vaccinating those not affected amounting to between 5,000 and 6,000 head a majority of herds were infected, and we saved 85 per cent. of the hogs treated and vaccinated. Have vaccinated pigs one day old, using 1 minim of virus blood and 10 m. hyperimmune serum. At weaning time we revaccinated and did not lose a pig. This was on a farm that was infected, but the mother had been immune. I believe from the experience just passed through, that pigs can be carried through on infected farms in this way, but while vaccinating while small, we are compelled to revaccinate when pigs weigh from 60 to 75 pounds.

In four herds on infected farms I carried the pigs through in this way. In most cases, however, I vaccinated the pigs at about 10 pounds the first time, using 3 minims virus blood and 2 c.c. serum. On two infected farms I could not get serum to revaccinate for three weeks after the required time, and in both instances the pigs became infected and on one farm there was a loss of 15 per cent. before I recovered the serum. Pigs weighed about 75 pounds. I used from 40 to 75 c.c. serum owing to the infection. Only lost 15 per cent. of the remaining pigs. I don't think one should treat small pigs that are infected; they do not have the vitality.

All animals in affected districts should have temperature taken before vaccination, and in territories where you are first commencing the work, one should not treat those having a temperature of more than 104. However, in aged hogs, weighing from 150 pounds up, you can save at least 60 per cent., but a loss of 40 per cent. in new territory will do the profession more harm than the saving of 60 per cent. will do good. A great secret in

treating infected herds is in using enough serum. I have used as much as 300 c.c. on male hog weighing 600 pounds, and am satisfied that saved the animal.

Our experience in vaccinating sows just before time to farrow has not been good. The sows were immune, but in four herds the pigs came with lumps on them, some scoury, some lame, others coughing, and in one herd three of four pigs came dead in almost every litter. In herds that are vaccinated just after having been bred, or first two or three weeks, the result was different. Pigs came all right, and were vaccinated at about 8 or 10 pounds weight. I want to insist that you should not use either serum or blood that has not been tested. I do not think that any state or nation should permit the use of either unless controlled by Bureau of Animal Industry, State Veterinary Board, or at least under state control. The demand is too great, making the sale hazardous, unless under such control.

There is not one single disease coming under the veterinarian's observation where the people are so readily swindled as in hog cholera remedies. In localities where the serum has proven beyond doubt its merit, the stock men will try every obnoxious remedy presented to them. They have been beaten so often that it has become a part of their nature, and it has become impossible for them to resist. Hence it is the duty of every veterinary surgeon, living in territory where hogs are grown, to put forth every effort to the education and enlightenment of his clients. Showing them that at last, after years of research, by the most able of our profession, we have a serum that will save the hogs from cholera. In Indiana, up to the middle of August, 1911, there was reported to Dr. Craigg, in charge of the experimental station, 188 herds vaccinated and treated, 75 herds were non-infected, 115 infected. Of those 75 non-infected herds, which contained 4,906 hogs, 51 herds had no loss from vaccination; the other herd loss 104, or a percentage of 2.25 per cent.

Of the 115 infected herds, which contained 8,071 hogs, 25 herds had no loss after treatment, the other 90 lost 765; or a loss of 9.50 per cent. Dr. Craigg informs me that over 50,000 head

have been treated and vaccinated in Indiana up to date, and at about the same ration.

To those of you who do not live in territory where swine are grown, this cannot appear of very great interest. But there is not a man, woman, or child living, who would not be benefited by the stamping out of hog cholera.

State of New York—Department of Agriculture.

ALBANY, January 15, 1912.

Hon. JOHN A. DIX,

*Governor of New York,*

Executive Chamber, Albany, N. Y.:

DEAR SIR—As indicated in my conversation with you some days ago, I hereby resign as Commissioner of Agriculture, effective February 16 or as soon thereafter as my successor shall qualify. If my successor desires to have my advice or assistance in becoming acquainted with his new duties, he will be welcome to all the help I can give him.

For a long time I have wished to make a study of certain agricultural conditions in Europe and I have decided to undertake this study at an early date.

It has been a great privilege to me to serve as Commissioner of Agriculture since April, 1908, and during a time when changes in the interest of better agriculture have been so marked. For your kind consideration, often shown to me both in an official and personal way, I express my most grateful thanks, and I wish you all success in the administration of your great office.

I am

Very truly yours,

(Sgd.) R. A. PEARSON,  
*Commissioner.*

State of New York—Executive Chamber.

ALBANY, January 16, 1912.

Hon. RAYMOND A. PEARSON,

Department of Agriculture, Albany, N. Y.

DEAR MR. PEARSON—In accepting your resignation as Commissioner of Agriculture I desire to state that you have performed the duties of that responsible position in an intelligent and efficient manner which reflects credit upon that greatest of all industries, agriculture.

Your qualifications have fitted you to meet the trying conditions promptly and well. Much has been accomplished in the advancement of all the departments, especially that of giving instruction, and I desire to add my word of commendation for the service you have performed.

I believe you are inspired by the right idea when you take up the study of agricultural conditions in foreign countries, where intensive farming has been practiced for generations. Thickly populated countries have been compelled to get a greater yield per acre than we have felt the necessity of accomplishing here. But the rapid increase of inhabitants has presented to us conditions to be met and problems to be solved without further delay. And I believe you can perform no greater public service than by studying conditions and methods abroad with an idea of helping to solve these problems.

Wishing you the best of success, and with expressions of my high regard,

I am,

Very truly yours,

(Sgd.) JOHN A. DIX.

## A WINTER DISEASE.\*

BY DAVID W. COCHRAN, D.V.S., NEW YORK, N. Y.

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The subject of the paper which I have chosen to be read and discussed this evening is what is ordinarily called "A Winter Disease." It is commonly called Scratches, Mud Fever or Snow Poisoning. It admits of a very wide scope for consideration. There are two principal causes, traumatism and constitutional disturbances. It is an acute or chronic inflammation of the skin, connective tissues, sheaths of tendons, coats of blood vessels, lymphatics, nerves and synovial membranes located in the region of the pasterns or fetlocks, and in some cases extends up the entire length of the limb.

*Causes.*—One of the first causes I will mention is clipping the horse's pasterns or fetlocks; the parts are robbed of their natural warmth, the silkiness of the hair has been removed and hard stumps or bristles left, which act as irritants, causing flexion crevices through which micro-organisms gain admission to the locality. Secondly, they often follow as the sequelæ of some debilitating disease where the vitality of the parts have been lowered through impaired nutrition or sluggish circulation.

*Varieties.*—We may have an erythema, an eczema-wound infection, followed by erysipelatous cellulitis, ulcers, elephantiasis, synovitis, keloids, or we may classify them under one head and call them "Dermatitis," a general term used to designate an undefined and extensive group of symptomatic inflammations of the skin, characterized clinically by heat, swelling, pain and terminating either in resolution or suppuration, gangrene or chronic dermatitis. In defining the several forms, we will begin first with *erythema*. It is an acute inflammatory condition of the skin, generally of short duration, characterized by slight congestion.

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\* Presented at the February Meeting of the Veterinary Medical Association of New York City.

redness, swelling and with marked stiffness or lameness, pain, occasionally terminating as vesicles or blebs. It is called by some an erysipelatous condition; we may have a suppurative capillary phlebitis. In eczema we have the same conditions, more intensified. The skin is fissured with crevices, leathery infiltrations and scaling. We have an exudate of plasmic fluid, which weeps for several days; we have fissures or flexion crevices, characterized by deep, painful cracks in the skin. These often end in an eschar—the crust or disorganized portion arising from the mortification of the part. The inflammation which it excites in the contiguous parts give occasion to the secretion of pus between the living and dead parts, which ultimately completely separates the latter. This process is called “sloughing.” We then have after the slough the lameness subsiding; or we may have an ichor-hæmia, a disease condition with a thin, aqueous and acrid discharge due to the presence of corrupted or vitiated humors in the blood. We may have the inflammation affecting the lymphatic system (the skin and its capillaries are affected, coagulation of lymph within the vessels takes place, closing up the channels). The coagulation may become organized hyperplasia of cells and consequent swelling and thickening.

*Elephantiasis* consists of a hypertrophy of all the structures of which the integumentary covering of the leg is composed. The epidermis becomes thickened, roughened and intersected with fissures. The dermis is thickened and the subcutaneous tissue is infiltrated with a gelatinous material, which often oozes out of the skin. It is due to engorgement of the lymphatics, together with a phlebitis, a periphlebitis and hardening of the cellular tissue.

*Thecal Abscess*.—We have thecitis resulting from inflammation of the sheath of tendon. The pain is most severe, pus is formed and confined and burrows into the bursæ of the joint. The foot is held some distance from the floor in a forward direction and is kept in constant motion, from pain. When forced to move he will hop with difficulty on the sound leg. On examining for the cause, one which is very difficult on account of the

irritability of the patient, we may find a pinhole opening in the hollow of the fetlock; if we insert a probe, it will descend down to the tendon sheath. These abscesses are attended with grave consequences that either prove fatal or run a troublesome course of long duration. Another course is that of *phlegmonous cellulitis*, or *phlegmonous erysipelas*. This is characterized by the spreading of a purulent or a fibrino-purulent exudate within the subcutaneous tissues. It is a passive congestion met with in undermined portions of the skin, which have been deprived of their direct arterial supply. This may extend the whole length of the limb, and be attended with large sloughs in several places, often exposing the bloodvessels and tendons along their course. Another affection very nearly of the same nature may be described as *gangrenous dermatitis*.

*Gangrenous dermatitis* is a striking example of gangrene resulting from a slight injury. It is a true mycotic gangrene. The skin becomes swollen and stasis is formed and blocked with micro-organisms. There is a loss of circulation in the capillaries. It sometimes follows a simple abrasion, as a flexion crevice, that allows the micro-organisms to enter the cellular tissue. They generally enter into the gangrenous process after some other action has interfered with the nutrition of the affected part. The early manifestation of gangrene is intense pain, severe lameness for several days; following this the skin becomes cold, moist and sweaty; finally sheds the hair at the affected part. There is a very offensive smell. After a few days the slough falls off and leaves a granulating surface. The wound heals without further event and leaves a hairless scar and permanent blemish; or we may have left a certain amount of œdema of a certain character, which is caused by a production of new connective tissue that often remains as a permanent tumefaction of the leg.

Another condition to which I wish to call your attention is that of keloids. This is a term applied to an overgrowth of scar tissue; also to a fibrous outgrowth of skin of a similar character, apparently spontaneous in origin, though most often traceable to wound infection. They are seen where the skin is not firmly at-

tached to the subadjacent tissues. The cellular tissue takes on great activity and the insignificant lesion of the beginning becomes a voluminous tumor that is very hard and vascular. This tumor may have several isolated enlargements. The growths will be prolific in portions. The nerves and bloodvessels and tendons are drowned in a fibrous tissue, which is the zone of attachment of the neoplasm.

*Pathology.*—Without going into detail about the different forms of micro-organisms, I will say the first effect of cold is to cause a contraction of all the parts acted upon. The small arteries of the skin become so narrowed that the circulation through the parts is completely arrested. The cellular elements become benumbed. The vitality of the part will be greatly lowered and finally extinguished. So long as the parts are bloodless, inflammation cannot manifest itself, but as soon as the vessels dilate on the restoration of natural heat of the part, inflammatory phenomena occur, varying with the degree of impairment of the vitality that the part has suffered during the exposure to cold. If the vitality has been destroyed, the blood fails to enter the vessels of the dead part and decomposition sets in; on the other hand, if from the sudden thawing of the frozen part a large quantity of blood is admitted, inflammation takes place. Exudation occurs in the damaged vessels, great swelling and tension ensue, and the circulation may again be arrested, and a part which has escaped death from the direct action of cold may rapidly become gangrenous after a short period of apparent restoration. If it escapes gangrene, the inflammation gradually subsides, after being accompanied by vesication. This process of chemical and physiological change, which is essential to every manifestation of life, being *only possible within certain very narrow limits of temperature*, is hindered or absolutely prevented.

In inflammation of the lymphatic structure we have both the acute and chronic forms. Acute inflammation may result from traumatism—extension of inflammation from infected wounds. In the chronic type the lymphatics may undergo fatty, caseous or calcareous degenerations—inflammatory conditions of tissue. We

may have tumefaction, due to the excessive supply of blood furnished by the dilated capillary vessels, and frequently to an accompanying œdema of the inflamed tissues. The duration depends on an abnormal connective tissue, cell growth and its organization and development into new tissue. Inflammatory indurations are slowly removed by nature through absorption. Suppuration of tissues may be a circumscribed process of destruction; it may accompany a superficial ulceration or granulative process. Circumscribed pus may exist as acute or chronic abscess, often followed by a suppurative inflammation of the lymphatic glands.

*Ulceration of Tissue.*—By an ulcer is meant a superficial solution of continuity of soft tissues dependent on a molecular death. This process can never exist within the substance of any tissue. It is essentially a condition of the surface. Ulceration effects cutaneous and mucous surfaces of the body. It may be the result of enfeebled circulation or defective nutrition from lack of blood, as is found in hind extremities, and in direct inflammation of an intense character, due to traumatism or infection. In ulcers we have a progressive destruction of the tissues, in which the solid parts seem to melt away into a liquid discharge without the separation of visible portions of dead tissue, as if a piece of skin be killed in any way, as by the application of some caustic or mechanical violence; there is at first no solution of continuity; the dead tissue is everywhere continuous with the living; but within a short time the phenomenon of inflammation manifests itself in the surrounding living tissues, thus imperfectly marking out the limits of the part that is killed. By the second or third day the line between the living and dead becomes more clearly defined. The skin at the margin of the living part becomes loose and is raised by a fluid beneath it, and at last comes away, exposing a raw surface, discharging pus. The living tissue which lies in immediate contact with the dead seems to melt away into the purulent discharge, till a complete solution of continuity is established. The dead part, or, as it is called, the slough, is separated from the parts beneath at the expense of the living tissues. The

irritant having acted on a limited portion of the living tissue with sufficient intensity to cause a retarded flow in the vessels, culminating in stasis and death in the parts *most directly acted upon*. Ulceration is in many cases simply a further stage of pustulation. Pustulation occurs in the first stage, but the irritant being so powerful that necrosis follows and the epidermis is involved in the necrotic process. In this way vesiculation, pustulation and ulceration may be regarded as stages in a single process. On the other hand, ulceration may occur with little or no preceding suppuration, as the result of a nerve lesion, due to trophic influences which determine the nutrition of the area supplied.

*Treatment.*—The essential phenomena of inflammation are: 1. The dilation of the arteries with increased blood pressure in the area supplied by the dilated vessels. 2. The exudation through the damaged walls, other things being equal, will be proportionate to the degree of intravascular pressure. 3. The migration of the white blood corpuscles. 4. The complete arrest of the circulation by stasis.

Acute inflammation is identical in all cases. It may vary in degree, in extent and in termination, according to the nature of the cause and the vitality of the tissues on which the cause is acting, but the process is always the same. When, therefore, varieties of inflammation are spoken of, the variations do not depend on differences in the essential nature of the process, in so far as changes within the vessels and the exudation are concerned, but are the results of variations in the cause and in the degree to which the vessels and other tissues are damaged by it. The vascular dilation and exudation cause the inflammatory swelling and give rise to tension, which, acting as a fresh source of irritation, aggravates the inflammatory process. One of the primary objects in treating inflammation is, therefore, to limit the exudation by diminishing the blood pressure, and, failing in that, to relieve the tension it gives rise to, both by local and constitutional means; but as an increased supply of blood lies at the bottom of most surgical processes, no process by which the separation of dead parts are affected or by which the repair of wounds or ulcers are car-

ried out can occur without it. In infective inflammations the fever may be due to contamination of the blood by the presence of some poison from the outside—a micro-organism which multiplies presumably in the blood. The multiplication of the poison in the body and the effect produced (not being proportional to the original quantity inoculated) has suggested that the poison is further developed by a ferment.

I am not acquainted at the present time with any procedure which would definitely destroy the poison in such cases. We must rely on the important place of treatment to tide our patient over this infection.

The local treatment should be warm, moist, antiseptic cataplasms. They are of great assistance in treating inflammation. Tension is relieved, effusion favored and overdistended vessels relieved. They are useful when suppuration is threatened, and hasten the slough. The general plan of treatment, therefor, will be antiseptic. Further details in the *modus operandi* I will leave for discussion by the members of the association.

PRESIDENT BRENTON, of the A. V. M. A., writes very encouragingly of the outlook of the coming meeting in Indiana. He says the resident secretaries are unusually active, the local committee have their arrangements well in hand, and he is looking forward to a banner meeting next August. He enjoyed a very successful meeting in his own State in the early part of last month.

“THE HORSELESS AGE.” (?)—Two of the water towers were sent to Nassau street, near Pine. One was the old-fashioned horse-drawn vehicle, while the other was the new automobile water tower. By some strange freak of fortune the motor apparatus, which is supposed to be the last word in the matter of water towers, went out of commission early in the day, while the older piece of apparatus continued to give valiant service. Both were sheathed so heavily in ice as to look like the spars of some unlucky vessel cast away and abandoned in the Polar seas.—(From the *New York Herald's* report, January 10, of the Equitable fire in New York City.)

## CANINE RABIES.

BY OSCAR SCHRECK, M.D.V., NEW HAVEN, CONN.

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SYNONYMS.—Canine madness, *Rabidus canis*, lyssa and hydrophobia.

DEFINITION.—Rabies is an acute infectious disease, affecting the cerebral and medullary nervous centres, and characterized by intellectual, emotional, aggressive and other nervous disorders, and by extreme reflex excitability.

ANIMALS SUSCEPTIBLE.—While the disease is seen most frequently in the canine races (dogs, wolves, foxes and jackals) and in the cat family (cat, lion), it is liable to spread widely among animals that use the teeth as weapons of offense and such as can readily attack. When inoculated, all warm-blooded animals contract the disease; man suffers mainly through the attacks of dogs, cats and, in certain localities, wolves and hyenas, but he is also liable to become affected from handling rabid domestic animals. Different animals differ in the susceptibility, the receptivity being apparently greatest in the carnivora.

GEOGRAPHICAL DISTRIBUTION.—Rabies is confined to no country nor climate, but it attains its greatest prevalence in the north temperate zone where there is the densest population and when the activity of travel favors the propagation of infection.

The facility for inoculation is the one determining cause, and, again, where the muzzling of all dogs has been rigidly enforced, as in many German cities and districts, the disease has been practically extirpated.

ETIOLOGY.—Long before the days of bacteriology, rabies was recognized by veterinarians as a disease due to infection alone; its absence from the various countries, its rapid propagation in other countries into which it had been introduced for the first time, and its restriction and disappearance where muzzling had been strictly carried out, had practically settled the question.

**VIRULENT MATTER.**—In 1830, Graner and Count Salm demonstrated the virulent properties of the saliva of the rabid dog. The actual factor which produces rabies is not certainly known, so that we cannot speak of its bacteriology. That it is due to a specific germ is now indisputable. Paul Bert and Nocard filtered the virulent fluid through plaster of paris and found the clear fluid that was passed through *non-virulent*. The virulent agent is, therefore, not a body in solution but a solid (organism) which is held back by the filter. Galtier found that the virulent saliva remained potent for eleven days if preserved from drying; the virus is very resistant to cold, having survived a temperature of 60 degrees for several months.

**INCUBATION.**—The duration of incubation varies with the species and individual, the seat and character of the bite, the amount of virus instilled, the potency of the virus, the age, size, and weight of the subject, the excitement of rutting, climate, or weather, and nervous or febrile disorders. In the dog, the incubation ranges from fifteen to sixty days and perhaps four to six months. It is claimed to have lasted a year, but this is somewhat doubtful; in cats it has varied from fifteen to sixty days. In solipeds it ranges usually from twenty to forty-five days. The extremes stated are fifteen days and twenty months; in cattle it ranges from fourteen to sixty days (exceptionally seventy days).

In man, incubation is alleged to be even more-varied, the rule is from fourteen to sixty days, but it is claimed to have been as short as three days and as long as one to twelve years: in the human being, however, there is always the danger of the disease caused by simple dread.

**SYMPTOMS IN THE DOG.**—In dogs, as in other animals, rabies is known by two great types, the furious, and the dumb or paralytic; which, however, usually succeed each other in fully developed cases. Some marked changes in the disposition or habits of the animal is the first obvious variation from health, and in a district or country where rabies exists, any such changes should be the warrant for instant seclusion of the dog before there is a disposition to bite.

The unwonted habit may be of almost any kind; the lively, amiable dog may become suddenly dull; the quiet, unexcitable dog may become unusually affectionate and demonstrative, licking the owner's hands and face and perhaps infecting him before any suspicion is aroused.

The noisy dog may become suddenly silent, while the silent dog may take to howling without apparent cause. A great restlessness or nervousness, or a tendency to start at the slightest sound and a disposition to move frequently in search of an easier position or place to lie in, are most dangerous symptoms. A morbid appetite, with a disposition to pick up and swallow all sorts of non-alimentary objects, straw, thread, cord, paper, pins, nails, coal, marbles, cloth, earth, dung or urine, and in a mature dog, is most suggestive. Searching around, scraping and tearing sticks, cloths and other objects to pieces, licking of smooth, cold stones or metal, are often early phenomena. The dog may hide in a dark corner going to sleep, and grumbling or growling when disturbed; he may make the night hideous with his howls, baying at the moon. He may stand with a dull, melancholy, hopeless expression of countenance, as if beseeching his master for relief from his nameless suffering; but as yet there is no disposition to bite. The dog still responds to the call of his master, but with dullness and in a marked contrast with his usual prompt, alert and loving response. There may be congestion at the seat of the bite and it may be licked or scratched or gnawed until raw, tender and bleeding; also an early change in the voice may be noticeable, or there may be a gradually developing into the rabid howl, which is quite recognizable at a distance and to the educated ear.

A GRAVE NOTE OF WARNING.—The apparently sleeping dog suddenly starts up with an air of suspicion and excitement; his eyes may turn after phantom flies or other objects at which he will presently snap; he will move about searching in the dark corners or under curtains or articles of furniture for some imaginary object. If recalled to reality by his master's voice, his healthy attitude and affection may be completely though temporarily restored. In his wandering the rabid dog will swim

ivers, and having no dread of water, just as at home, he will plunge his nose in water though unable to swallow. The furious stage is ushered in by more pronounced manifestations of the above symptoms, and when in this way he exhausts himself by his paroxysms and may perish in one of them, or he may meet his death from man or animal.

In the early stages of the disease the dog walks or trots like any other dog. It is only when exhausted by wandering or violent paroxysms, or both, that he droops his head and ears, hangs the tail between the legs, and slouches along with arched back and unsteady, swaying limbs. The appearance of these last symptoms implies advancing debility and paresis, and the near approach of paraplegia.

THE DUMB FORM OF RABIES.—In dumb or paralytic rabies, the striking peculiarity is the omission of the preliminary furious stage, and the disease merges at once into paralysis after the premonitory symptoms; in these cases the early nervous symptoms tend to prostration, weakness and dullness, or even stupor. There is no disposition to escape but rather to seek seclusion and quiet. There is rarely howling and then only at first; and soon there is paralysis of the masseters and dropping of the lower jaw, and there is neither ability or desire to bite. From this the paralysis extends to the hind limbs and then to the fore limbs and trunk; in other cases one limb is the first to suffer, followed by the face, limbs and body. The most prominent feature is the widely opened mouth, the flaccid, hanging tongue and drivelling saliva. The buccal mucosa, at first red and moist, becomes bluish, dry and powdery. The eyes are dull and mournful and suffering, or altogether without expression, and the pupils are usually widely dilated. The hind limbs are usually utterly helpless and often the fore ones as well. The prostration is extreme and the patient lies quiet and helpless until released by death in two or three days.

DIAGNOSIS.—The early diagnosis of rabies in the dog is of supreme importance, as enabling the owner to destroy or seclude the dangerous animal before he has developed the disposition to bite and to propagate the disease.

**DIFFERENTIAL DIAGNOSIS.**—The symptoms may be simulated by those of some other disease. Thus the bitch which has been exhausted by lactation may show delirium and a disposition to snap; the presence of a bone or other foreign body fixed between the upper molars, and various injuries of the lower jaws, teeth or throat, may cause inability to swallow, change of the voice, and a morose disposition and expression. In such a case there may be vomiting, as if to disengage something, and salivation, but there is no delirium or fury, muscular weakness or paralysis.

In paralytic rabies, on the other hand, along with open mouth and drivelling saliva, there is no disposition to paw the mouth or face. The buccal mucosa is not simply red but of a deep violet, and there is attendant weakness or paralysis of the hind parts.

Epilepsy is not to be roused by sudden noise. Movements or attempts to swallow are not associated with hyperæsthesia, and the spasms affect the muscular system more generally. Codeac finds rabiform symptoms with disorders of the special senses in animals dosed with various essential oils, but the odor of these essences about the mouth and in the breath would serve to distinguish it.

**THERAPEUTIC TREATMENT.**—That rabies was necessarily fatal, as indeed nearly all developed cases are to the present day, for this reason, and much more on account of the risk of preservation and propagation of the deadly germ, the attempt at curative treatment in the lower animals has been looked on as utterly unwarranted or absolutely criminal.

**PROPHYLAXIS.**—The most effective way of preventing rabies is to eradicate the virus from the country. The enforced muzzling of dogs for a period of one year would almost certainly stamp out the disease. Berlin in 1853 had many cases of rabies and muzzling was enforced, and in three years it was completely eradicated and the city enjoyed nine years of immunity, or so long as the law was enforced.

## WOUND HEALING.\*

BY A. T. KINSLEY, KANSAS CITY, MO.

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The subject of wound healing has been discussed pro and con by various pathologists and practitioners, and it is possible that the subject no longer has its charms for many; however, from the pathologic and therapeutic standpoint, it is apparent there is still much concerning wound healing that is not definitely known, or at least is not put into practice.

A wound may be defined as an interruption of the continuity of tissue or tissues. Some have restricted the term to those conditions resulting from traumatism. Others have confined it to injuries of soft tissues, and still others maintain that wounds occur only upon a surface. There are no good reasons for these restrictions, because thermic and chemic influences produce interruption of tissues which are not unlike and are not distinguished from wounds mechanically inflicted; again, a fracture is a break in the continuity of osseous tissue and is repaired in exactly the same way as in a wound in soft tissue, and further a rupture, as of the liver or the spleen, is characterized by tissue destruction and interruption of the continuity of the integral parts of the injured organ, and if it is not a wound, what is it? Usually the term "wound" is restricted to those injuries that are produced by sudden violent action; thus ulcers and necrotic tubercular centers are not wounds. A bruise may or may not be a wound, depending upon the nature of the lesion; that is, whether or not an interruption of the tissue has been affected.

There are a variety of ways of classifying wounds, of which the following will serve for this discussion: Etiologically, wounds may be traumatic, chemic or thermic. Topographically,

\* Presented at the Semi-Annual Meeting of the Missouri Valley Veterinary Medical Association, Omaha, Nebraska, July, 1911.

wounds may be surface or subsurface, and again they may be facial, cervical, thoracic, abdominal, etc. According to character, wounds may be incised, punctured, lacerated, contused, as produced by a stab, shot or bullet, or a bite. As to condition, wounds may be infected or non-infected.

Wound healing is the simultaneous regeneration of the tissue complex of an area in which there has been previous destruction. Traumatic wounds usually heal more readily than wounds resulting from thermic or chemic causes, because traumatism is the result of mechanical force only, and the destructive influence ceases immediately upon removal of the cause, whereas the influence of thermic, and especially chemic, causes continue for a variable period.

Many methods of wound healing have been described, such as immediate union, primary union, secondary union, tertiary union or intention, healing under a scab, etc. When the exact conditions are understood, it is found that practically all wound healing is of one or two types, primary union or first intention, and healing by secondary union or granulation. Healing by primary union is desired in all wounds. Unfortunately, this method of wound healing is not obtained as frequently as it should be in veterinary practice. The majority of practitioners have thus far not attempted to obtain primary wound healing in any except small surgical wounds. Often surgeons do not properly prepare their fields of operation and do not give the proper care and after-treatment of surgical wounds to favor this type of healing. This is deplorable, and is one of the most frequent causes of condemnation of veterinarians. Why veterinarians do not take more pains to observe antiseptic precautions in their surgical operations is difficult to explain. In talking this matter over with practitioners, most of them make the plea that they have not the time to do aseptic surgery, and that their clientele will not pay for this kind of work. Such surgeons are really to be pitied, for it is indicative of improper understanding of aseptic surgery, as well as showing that they have failed to impress their clientele by their surgical efficiency. If a surgeon will successfully perform two or three

aseptic surgical operations, in which the wounds heal by primary union, he will have no difficulty in obtaining the future cases and a good fee for aseptic surgical operations in the same community. It is not an impossibility and, further, it is not difficult, to obtain primary wound healing even in large lacerated wounds. Certainly, time is required to prepare the wound, but after the first dressing little, if any, attention is then required, and the advantages obtained more than offset the extra time required in placing the wound in such a condition that it will heal by primary union. This type of healing is rapid, and it usually does not leave an unsightly scar; thus the animal is back into service in a very short time. The value of the animal is not depreciated by unsightly scars, but the actual time required of the surgeon is less than it would be if he would have permitted the wound to remain infected and thus require daily treatments.

The other type of healing—that is, by granulation—is the type usually observed in the majority of wounds in the domestic animals. It is this type in which there is a continued infection and a continual destruction of the newly generated tissue, thus necessarily increasing the length of time for the wound gap to be filled with new tissue. This type of wound healing can be obtained by anyone and under any conditions surrounding it. It is certainly no credit to a veterinarian to have under his care several cases of wound healing in which the method of healing is by granulation.

The process of healing by primary union embraces coagulation of the hemorrhage extravasate, agglutination of the wound margins, hyperæmia, inflammation, vascularization, fibrous formation, disintegration of the hemorrhage extravasate and inflammatory exudate, cicatrization, epithelization and substitution, the time required for the latter being much greater than the former.

As previously stated, it is possible to obtain primary healing even in large lacerated wounds, if the wounds are properly prepared by first shaving the hair from all adjacent tissues, then thoroughly cleansing the wound and marginal tissues and remov-

ing all fragments of tissues, after which the wound margins are brought into apposition and maintained in a fixed, immobile position. The method of procedure that should be resorted to in the cleansing of a wound prior to bringing the various parts of it in apposition with sutures or otherwise, depends somewhat on the nature of the wound. In a lacerated wound in which there has been introduced filth, as dirt, fecal matter, hair, etc., the parts should be thoroughly washed with physiologic salt solution until the filth has been entirely removed. The tissue shreds should then be removed by the use of sterile instruments, and some disinfectant used in further cleansing the part. The application of the disinfectant should be again followed by washing with sterile physiologic salt solution, for be it remembered that if disinfectants are applied tissues are destroyed, the extent of which will depend upon the strength of the disinfectant and the length of time of its application; the purpose of the application of the disinfectant is to insure the destruction of all infectious agents, and the object of the application of the salt solution after the disinfectant is to wash away all excess disinfectant, and thus prevent further tissue destruction and remove shreds of tissue that may not have been removed before.

Such treatment of a wound will essentially require considerable time. I have seen some such wound treatment, and in one instance I remember where the irrigation with the salt solution was continued for four or five successive hours, and in this wound some thirty sutures were taken, the wound healed by primary union and the animal was back in service inside of one week. If a lacerated wound has not had filth or infection of any kind introduced; in other words, if it is fresh and clean, then a thorough irrigation for from thirty minutes to two hours with a salt solution is preferred without the application of a disinfectant. After the wound is thoroughly cleansed, the various parts of it may be adjusted, the kind of a suture and the method of suturing depending upon the nature of the wound, always selecting that type of suture which will hold in position best with the least destruction of the tissues. When a wound is sutured, especially if it is

of large size, it is necessary to provide drainage, the kind of which will depend upon the nature of the wound.

In the treatment of granulation wounds of long standing, it is possible in many instances to render them aseptic and bring the wound margins in apposition, and thus induce primary union. In some instances, however, there is so much destroyed tissue that it is impossible to obtain immediate union, even though the wound is thoroughly cleansed. There is no question but that the application of antiseptics as frequently practiced is harmful, and the tissues are frequently injured and wound healing retarded by the application of such agents. Wounds are protected by the inflammatory exudate which continually oozes to the surface, thus favoring granulation, which ultimately results in the filling of the gap, in completing union of the tissues, the time required being much less than if tissues are repeatedly destroyed by the frequent application of antiseptics.

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THE MISSOURI VALLEY VETERINARY ASSOCIATION passed the following resolutions at the Kansas City meeting of the association:

Resolved, That the Missouri Valley Veterinary Association approves House Bill No. 16843, and urges upon Congress its passage at this session.

Resolved, That we request every member of this association to *immediately* correspond with Congressmen and United States Senators urging them to support the Army Veterinary Bill, known as House File No. 16843.

Resolved, That this association urges upon Congress the necessity of establishing supervision by the Bureau of Animal Husbandry over the manufacture and distribution of biologic products intended for interstate traffic and for use upon animals.

Resolved, That we deem the passage of the bill appropriating \$500,000.00 for Texas fever-tick eradication of vast importance to the livestock industry, and we urge its passage.

Doctor, will you take the time to write to *each Congressman from your State, and especially the Representative from your district, and both Senators*, urging them to favorably consider the above measures? A united action by veterinarians will secure the passage of these bills. *Will you help?*

## NECROBACILLOSIS IN SHEEP, OR LIP-AND-LEG ULCERATION.\*

BY H. S. EAKINS, D.V.S., SECRETARY-TREASURER OF THE STATE BOARD OF SHEEP COMMISSIONERS OF WYOMING.

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*History.*—Necrobacillosis in sheep is by no means a new disease, but has been known in the British Isles, France, Germany, Hungary, New Zealand and in North America for many years. It has made itself manifest in various forms and in different degrees of severity.

It has been known under several names—as acute-pustular-necrotic and ulcerative stomatitis, necrotic and pustular dermatitis, foot-rot or sore-lip in limbs, necrobacillosis, lip-and-leg ulceration, etc.

*Cause.*—The causative factors applied to this disease are numerous, as errors in diet, low vitality, unhygienic surroundings, frost, rough forage, cactus, various strains of pyogenic organism, amœba parasitica and the bacillus necrophorus. Some of which, no doubt, are the predisposing causes for the entrance and the favorable growth of the most probable etiological factor, *the bacillus necrophorus*.

The bacillus necrophorus is an obligate anaërobe, ubiquitous in habitat. It is a slender rod-shaped organism; but pleomorphic, coccoid and filamentous; and in involution, club-shaped forms are found, according to the environmental influences, as media, season, age, etc. The filaments are usually beaded, and lie in a mycelial-like mass, but true branching has not been proven.

It can be grown in a nitrogen or residual gas atmosphere in agar or in bouillon. Gas is given off, indol is produced. It is stained by the ordinary carbol-fuchsin and Löffler's methylene-blue stains. In the filaments metachromatic granules are present.

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\* Paper given before the Colorado Veterinary Association at Denver, Colorado, January 18, 1912.

There is no doubt but that there must be a break in the continuity of the external tissue before the bacillus necrophorus can gain an entrance for multiplication. Predisposing causative factors and lowered vitality must be taken into consideration. Dr. B. F. Kaupp, pathologist to the Division of Veterinary Medicine, Colorado State Agricultural College, is of the opinion that in lambs first turned into feed lots on rough feed, under which condition sore-lip usually appears in a certain per cent. in about seven to ten days, there is a symbiosis present; *i. e.*, first there must be a lesion, next the aerobic pyogenic organisms gain entrance and produce by the utilization of the oxygen in the wound, an anaerobic condition favorable for the growth of the bacillus necrophorus.

The primary lesions of sore-lip in lambs in the feed lots is due in many instances to the Russian thistles in the feed. In Wyoming cactus, grease-wood, frosts, etc., play an important part in this disease. Lesions occur on the forelegs of bucks from striking, on the heads due to butting, on the sheath and the penis from mounting and having the said parts abraided by cockleburrs or sandburrs, on the stump of the lambs' tails due to trimming, in the vulva and perineal region in ewes from breeding; also infection takes place through the sebaceous glands situated in the interdigital spaces of the hoof, especially when pierced by cactus. The virulence of the different strains of the bacillus necrophorus found in different localities, together with the condition of the sheep or bucks, is of great importance.

In certain sections of New Mexico and of Colorado the strains of the bacillus necrophorus have a tendency to be less virulent than those of Wyoming. In the former localities the disease tends to clean itself up, so to speak. In Wyoming a very small per cent. can get well without treatment, and radical measures usually must be applied in nearly every outbreak.

*Symptoms and Lesions.*—The usual symptoms are found; *i. e.*, those of necrotic ulcer formation upon the different parts of the body, with dry, hard scabs and some discharging pus of a characteristic odor, sloughing and hemorrhage of the penis, ulcerative vulvitis, inflammation and ulceration of the sheath, forming

the so-called "rosettes"; fistulous tracts, loss of condition, rapid spread and enzoötic nature of the disease, etc.

*Treatment and Methods of Control.*—In Wyoming we are using the following methods in the control and in the eradication of necrobacillosis in sheep: The education of the flockmasters to a point where they will understand the nature and the necessary steps to be taken in the treatment of this disease is of primary importance. We are recommending the use of publications issued by the Bureau of Animal Industry and by the experiment stations for this purpose. We are recommending that frequent inspections be made by camp-tenders, who are to be supplied with necessary disinfectants to treat all cases of ulcerations that are brought to their notice by the sheep herders, the sheep herders to watch each day for any signs of this disease, and to report the occurrence of the same to the camp-tender. In some instances range riders are employed by the owners.

In every outbreak the diseased bands of sheep or bucks, also the infected pens or corrals, are placed into strict quarantine as far as possible, and no quarantined sheep can be moved except by a trailing permit granted by a State or Federal inspector.

However, in many instances the exposed sheep or bucks, especially in winter, are running on the range on short feed, and distant from any suitable inclosure, and needs must be moved often; consequently, if the said sheep be kept on too narrow range in close quarantine, the result would be lowered vitality with an increased tendency of the sheep toward the disease.

Mounting chutes are used in the examination of the infected bands of sheep; the diseased are marked with blue chalk and the same are cut out in a cutting chute and placed in quarantine; these are called the "Hospital" band.

Our work now is to treat the exposed sheep, if practical. A trough one foot deep, sixteen feet long and wide enough for one or for two sheep is placed in a chute; at the far end of this trough on the side of the chute is placed securely a bucket or small box containing some of the dip solution as used in the trough. Into the trough is run a five per cent. solution of some recognized cre-

sol or coal-tar creosote dip heated to 110° to 115° F. to the depth of eight or ten inches. The exposed sheep are waded through this dip slowly, and when opposite the small container on the wall an assistant dips each nose to the eyes in the hot dip; another assistant swabs the genitals with the solution. These sheep are trailed while the dip is still wet across the infected trails, if any, to clean range. In one week they are given the same treatment again. The theory of this treatment is to disinfect the parts of the exposed sheep on which the lesions generally occur. The grease of the wool still contains the germs that cause this disease; in an attempt to combat these we give the exposed sheep a general dipping. But here is a problem: The water used in this dip is subjected to a test to determine the exact amount of lye or of sal soda that will counteract the temporary hardness; in most instances it requires one to one and one-half pound of lye; or four to six pounds of sal soda per hundred gallons. The question is, How much lye or sal soda is necessary to dissolve out the grease of the wool in order that the dip may reach the germs, and at the same time be not too severe on the health of the sheep?

After the general dipping of the exposed stuff, they are kept on clean range and subjected to frequent inspections.

The diseased sheep are tabled, the wool around the sheath in bucks is removed by means of sheep shears, the ulcers are curretted and treated with the hot dip, five per cent. solution. The legs are swabbed up to the carpi and to the tarsi with the dip. The ulcers on the genitals are curretted and penciled with silver nitrate; a dilute antiseptic wash is used, as potassium permanganate or the emollient dressing recommended by the Bureau of Animal Industry is applied. Those that show foot lesions only are subjected to hot foot dips, and the same general treatment as for the exposed.

The instruments, also the hands and the clothing of the attendants, are kept as aseptic as possible.

All infected and exposed trails, corrals and ranges are mappd. The work is systematized, so that the work of quarantine, isolation and treatment may be carried out with the least possible loss to the sheep owner.

The quarantined corrals and pens are scraped, the sheds are

thoroughly cleaned from debris, and all are then disinfected. The manure and debris are burned, buried or placed upon some isolated tract that the elements may have their effect.

Shearing-pen inspections with a general dipping for the exposed or infected bands of dry ewes, wethers and bucks after shearing is indicated; but it would mean a loss to dip ewes heavy or with lambs at this time.

*Immunity.*—Through experiments it has been proven that the bacillus necrophorus gives off a very active toxin. Rabbits and sheep that have been injected subcutaneously with the same have died in twelve to sixty hours.

At the present time Dr. B. F. Kaupp and I are co-operating in the manufacture and in the testing out of a vaccine and of a serum prepared from the bacillus necrophorus, with the hope of finding something useful with which to combat the disease.

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DR. JOHN L. GROSS, Manila, P. I., has removed to Denver, Colo. The doctor, who has been stationed at San Fernando, La Union, in the government service, will no doubt welcome the change to the States.

DR. HERBERT F. PALMER has severed his connection with the Abbott Alkaloidal Company and accepted a position with the H. K. Mulford Company, Philadelphia, where he assumes his duties March 1. Dr. Palmer's success in his former position, where he organized the veterinary department, and his many friends among the veterinarians throughout the country, insures his success in his present position.

THE *Ottawa Evening Journal* of February 6 says: "It is learned that Hon. J. G. Rutherford, Chief Dominion Veterinarian, has handed in his resignation to Hon. Martin Burrell and will go to British Columbia. Dr. Rutherford resigned early last summer, but was still in charge when the change of government took place. It was thought that he would reconsider his determination to drop out of the service. Dr. Rutherford, however, has decided to retire to private life, and his resignation, it is said, is now in the hands of the minister of agriculture. Dr. Rutherford has been a valuable servant to Canada, and his retirement will be generally regretted."

## REPORTS OF CASES.

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### A CASE OF HYOSPADIAS IN A RAM.\*

By RAYMOND PEARL, Ph. D., Biologist of the Maine Agricultural Experiment Station, Orono, Me.

Some months ago there came into my possession, through the kindness of Professor T. R. Arkell, of the New Hampshire Agricultural Experiment Station, a lamb which possessed such abnormalities of the external genitals as to suggest that it might possibly be a case of hermaphroditism. In sending the animal Professor Arkell wrote (October 14, 1911) as follows regarding its history: "We have in our station flock here an hermaphrodite lamb about three and a half months old. He possesses a scrotum, or rather a double scrotum, and two small testes. He has an excrescence in his belly where normally the sheath is, but there is virtually no opening therein. He has an opening behind resembling a normal vulva, through which he urinates."

When received the animal was submitted to a careful external examination. It was rather small in size, but otherwise presented no peculiarity in general external appearances. This is evident from Fig. 1. No peculiarity of any kind relative to secondary sexual characters was to be observed, other than in respect to the external genitals, which were obviously malformed.

The condition of the external genitals was as follows: The *scrotum* was of normal size, but cleft in the middle line clear to the body wall, so that separate right and left scrotal sacs were formed. These sacs were covered with short wool, except where they joined each other in the middle line. Here there was a strip of skin about 1 cm. wide, which was soft, devoid of wool, and pinkish in color. From its cranial end, which was at the cranial end of the cleft separating the scrotal sacs, this strip of moist, bare epidermal tissue extended caudad and dorsad until it reached the anus. As it approached the anus it widened in extent. In the

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\* Papers from the Biological Laboratory of the Maine Agricultural Experiment Station, No. 34.

normal position of the scrotal sacs and the legs this tissue was thrown into a deep longitudinal fold, somewhat simulating in superficial appearance a vulva. The appearance of the structure described may be seen in Fig. 2.

In the scrotal sacs testes could be felt. At the time of the first examination (October 27, 1911) these organs were distinctly

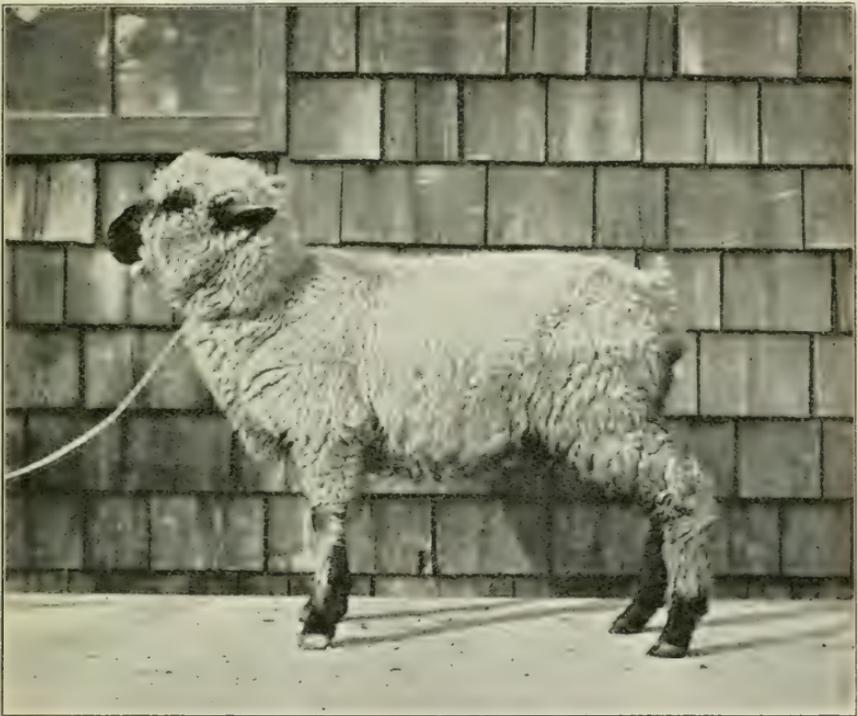


Fig. 1. Showing general appearance of lamb discussed in text.

smaller than at the time of autopsy (January 13, 1912). The sheath could be felt as described by Professor Arkell.

The animal was killed and dissected January 13, 1912. A typical case of hypospadias was the condition found. The testes were of normal size and appearance. The penis was small but normal, except in regard to the urethra. From the neck of the bladder (which was normal) the urethra ran caudad as a closed tube to a point just below the anus. There it ceased as a tube, and as an open fold of membrane became confluent with the skin on either side, forming the pinkish moist strip of tissue already described from the external examination. The urine was discharged

through the small opening where the tubular portion of the urethra ended just below the anus. This opening was so close to the anus, and the cleft formed by the opened-out urethral wall was so deep, as to give the appearance in external examination described by Professor Arkell, that the urine came from a vulva-like organ.



Fig. 2. Showing the appearance of external genitals in lamb. The two parts of the divided scrotum are held apart, showing the deep cleft between. A, anus. B, level where tubular urethra opened to outside. The strip of opened urethral tissue shows here. C, right scrotal sac. D, left scrotal sac.

The right and left vasa deferentia, after leaving the testes, passed up through the inguinal canals in the normal manner. Their course to the dorsal wall of the bladder was perfectly normal. There these tubes came to lie close beside one another, and the pair extended caudad to a point just caudad of where the urethra left the bladder. There they ended blindly. There were no openings of the vasa deferentia to the urethra. Both vasa deferentia were considerably enlarged (to an average diameter of about 4 mm.) throughout the last 4 or 5 cm. of their course. The cause of this was an engorgement with material, which consisted apparently of hardened secretion from the accessory glands. The enlargement was greatest at the blind ending of the ducts, and tapered off gradually in the cranial direction.

No other abnormalities beyond those here described were found in any part of the body.

The case was clearly one of typical *hypospadias perinealis*.

## DISLOCATION OF THE FEMUR.\*

By B. F. KAUPP, Pathologist, Div. Vet. Med. Colo. State Agr. College, Fort Collins, Colo.

In the pathology museum of this college the author has assembled two interesting cases, which, according to the leading surgeons, would come under this head.

Moller states that dislocation of the femur is always accompanied by rupture of the ligamentum teres.

Firdler reports one case in a foal in which the epiphysis was separated from balance of femur.

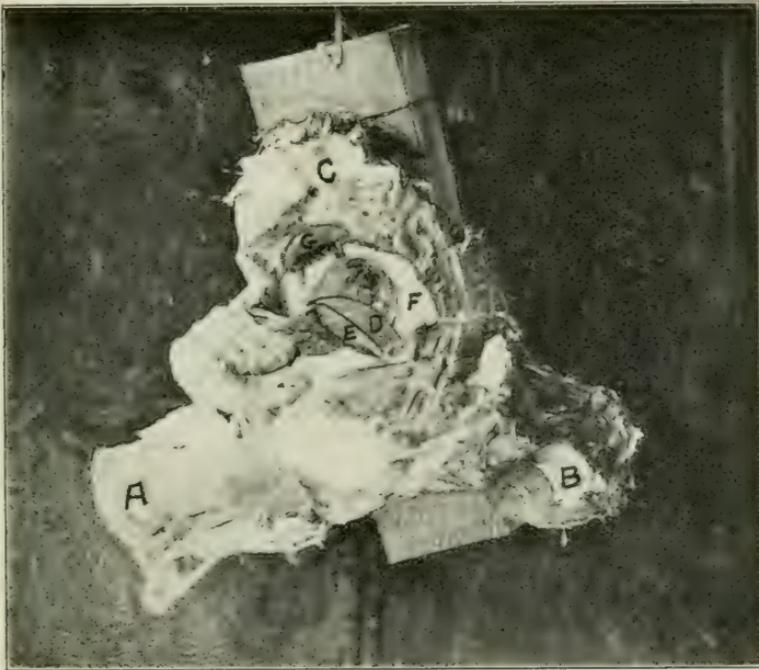


FIGURE 1

As causes are given violent movement of the limb on the hip joint, excessive flexion or extension in falling. Excessive lateral movement, either adduction or abduction.

As symptoms are given the limb may be lengthened or shortened, depending on the direction the articular head takes. Its

\* From the Laboratory of Pathology, Division of Veterinary Medicine, Colorado Agricultural College.

movement in certain ways may be limited, while in others it may be increased. Freedom of movement is always lost.

Prognosis is always unfavorable.

Figure No. 1 represents a case in a foal about two months old, who became frightened by a passing object and ran up a steep embankment and fell. *A* is the end of the sectioned femur. *B* is the ischial tuberosity. *C* is the sectioned end of the ilium. *D* represents the articular head of the femur separated at *E* from the neck. *F* represents the cotyloid cavity, in which the articular head normally rested. *G* represents a new facet, at which point a new articular surface was being formed.

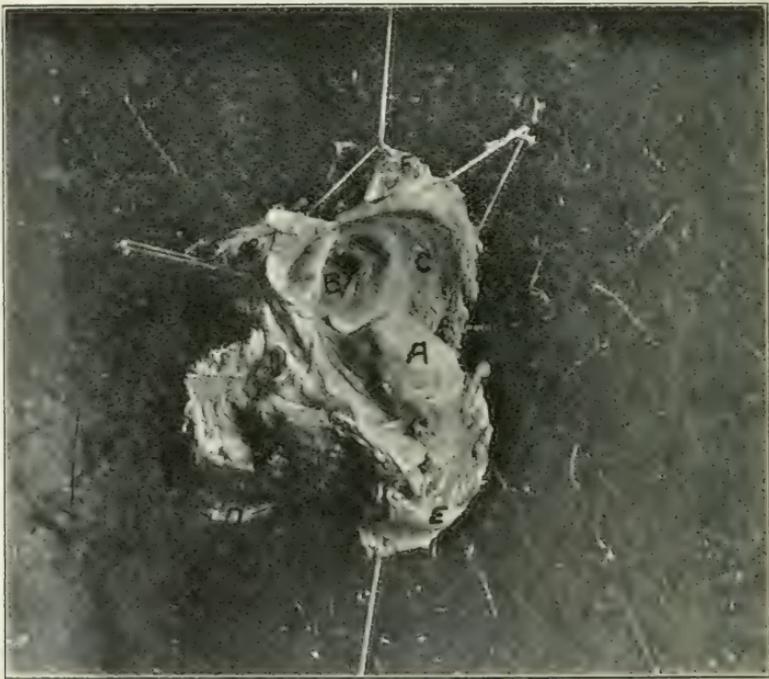


FIGURE 2.

The case was of six weeks' standing when the colt was destroyed. The head of the femur was displaced upward and forward. The leg was considerably shortened.

In this case the ligamentum teres was ruptured.

Figure No. 2 was a case of a bay mare eight years old. All the history that could be secured was that she had been kicked a year previous. The leg was considerably shortened. No weight could be placed on the leg.

*A* represents the articular head of the femur. *B*, the normal articular cavity. *C*, the newly formed cavity in which the head now played. At the lower border of the articular head can be seen some exostosis, as well as in the newly formed cavity. *D* represents the sectioned end of the femur. *E*, the ischial tuberosity. *F*, the sectioned end of the ilium. The displacement was upwards and a trifle backwards. There was a rupture of ligamentum teres and a partial rupture of the pubeo-femoral ligaments.

### A POLY-CELLULAR CYST.

By J. E. AGHION, V.S., Veterinarian State Domains, Sakha, Egypt.

The photograph which I here produce illustrates a case of a poly-cellular cyst, which, for reason of its rarity, may be of some interest to the readers of the REVIEW.

A brown mule, nearly 17 years old, had a big growth situated low down on the left side of the abdomen, and is about the size



of a man's fist, soft to the touch when first examined (two years previous to the operation), but now hard, somewhat round in shape and movable. It has been growing for nearly eight years to attain its present size, without materially interfering with the animal's general health or its usefulness.

An operation, with removal of the tumor, was suggested and performed on November 22, 1911. The animal was cast and the seat of operation properly disinfected; a trocar and canula were first introduced into the tumor to ascertain its nature; a jelly-like fluid escaped through the canula, indicating that one has to deal with a cyst of some sort.

An incision was then made and the operation carried through; the skin and connective tissues were carefully dissected, the tumor seized and finally removed with the ecraseur. No hemorrhage followed. The cyst weighed 830 grammes; the clinical and microscopical characters go to show that it is a poly-cellular cyst.

The wound was daily dressed with creolin solution and dusted with iodoform; during the treatment the animal suffered from an enormous cedema of the abdomen, but got over it five days afterwards. The wound healed up nicely and the animal made a good recovery, and now in regular work (December 23, 1911).

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SPECIAL PATHOLOGY AND THERAPEUTICS OF THE DOMESTICATED ANIMALS, by Hutyra and Marek. Third revised and augmented edition. Published by Gustav Fischer, Jena, Germany.

After an elapse of only a little more than two years a new edition of this classical work of two volumes became a necessity. It speaks well for its popularity among German readers. Our English literature has no equal to this excellent work.

The new edition was greatly improved and augmented. Quite a few instructive pictures, also a number of artistically produced colored plates were added. Special attention has been paid to the sero-diagnostic methods and the diseases caused by blood parasites, and also to preventive vaccinations.

This classical work cannot be recommended too highly, and the wish for a translation into the English language in the near future certainly appears justifiable.

DR. WILFRED LELLMANN,  
Professor of Veterinary Pathology.

## ABSTRACTS FROM EXCHANGES.

### ENGLISH REVIEW.

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

TWO CASES OF NECRO-BACILLOSUS [*W. Walker, M.R.C.V.S.*].—Although no bacteriologic examination was made, these two cases were considered by the author as due to Löffler's bacillus:

*First Case*—Dog quite lame on near fore leg. The whole foot is intensely inflamed and swollen, up to the carpus. Between the digits the skin is red, thickened and hairless, with pinhead areas of serum-like fluid. The pad enlarged, twice its normal size. In the course of a few days shows pustules, from which exuded dark colored bloody pus. Little fistulas resulted, and a probe could be introduced in them, three-quarters of an inch between the skin and bones. Some necrotic tissue escaped with the discharge. The dog still kept in good health. Treatment: Clean bedding, liberal diet, fistulas split up, abscesses opened and antiseptic dressings. Quinine and iron were given internally. Recovery in five weeks.

*Second Case*—Two-year-old male cat. Large necrotic area on the face, skin hard and parchment-like, much under-run in the centre, but firmly adherent to healthy tissue round. Several pinhead-like holes give out dark thin pus. Treatment: Incision of diseased skin and usual treatment of present wound. Recovery rapid.—(*Veter. Record.*)

MELANOSIS IN THE HORSE [*F. Chambers, M.R.C.V.S.*].—Illustrated record of the case of a 13-year-old grey mare, in fair condition, whose body was covered with numerous deposits of melanin, principally in the parotid region of the off side. The presternal, precrucial, popliteal and other glands were also diseased. This condition had been growing slowly since six years. Special bridle had to be made for the mare on account of the

enlargements at the bone of the ear; with it the animal could be used without any trouble.—(*Vet. Journ.*)

**BRAIN CASE** [*Capt. A. J. Williams, A.V.C.*].—Fourteen-year-old cob showed staggering gait. She leans on the off side, rests against the stall partition, has discharge from both nostrils, pupil normal, nervous expression. Marked incoordination of movements and ataxic gait. Near foreleg throws out spasmodically in walking, foot put to the ground as if uncertain of the distance. Paraplegia appears the next day. Treatment: Purgative, laxatives and potass. iodid. Case diagnosed as cerebral hemorrhage was followed by recovery after a few days.—(*Ibid.*)

**IMPACTION OF THE COLON DUE TO ABDOMINAL ABSCESS WITH RUPTURE AND DEATH** [*C. W. Townsend, F.R.C.V.S.*].—A three-year-old shire gelding showed symptoms of colic, which are attributed to impaction of the colon, verified by rectal examination. Usual treatment was followed by good results. Three days after the colt is taken sick again with more severe symptoms and, notwithstanding all care, died on the fifth day from the first attack. *Postmortem*: In cutting into the scrotal region a quantity of yellow inspissated pus was discovered. In the abdomen there was also more or less pus mingled with the abdominal contents. At the entrance of the internal abdominal ring on the near side were found the remains of a big abscess cavity with darkened walls, in which there remained some foul smelling pus.—(*Vet. Journ.*)

**CLINICAL CASES** [*Prof. J. J. O'Connor, M.R.C.V.S.*].—*Sternal fistula in a horse.* A sinus of long standing, running on the cariniform cartilage of the sternum. Properly treated recovers.

*Sinus in lower jaw.* This existed in the right horizontal ramus of the lower jaw and had resisted all treatment. The sinus was freely opened, curetted down to the bone and treated with antiseptics, principally iodine. Recovery in two months.

*Tracheocle in a horse.* Aged hunter has carried tracheotomy tube for past twelve months. The original tube had become damaged and while another was to be fitted, a large cartilaginous granulation formed inside the trachea and encroaching on the tracheal opening. Under the influence of cocaine, the horse

was relieved of this by excision in slices with a sage knife and finally a new tube was inserted, enabling the horse to continue his work as a hunter.

*Urethral calculi in a dog.* Old collie in poor condition, has distressed appearance, passes urine in drops frequently, shows pain on pressure over the prepubic region and a catheter introduced is arrested just behind the os penis. Morphine is injected. Penis is exposed, the urethra opened just behind the os and six small spherical calculi are removed. Although the dog recovered from the narcotic, he died 24 hours after. Postmortem showed the bladder highly inflamed.

*Needle and thread in rectum of a pug.* While playing he was seen swallowing both the needle and thread. He has anxious expression, screams now and then with pain, passes blood by the anus. Rectal digital examination detects the needle some distance from the anus. In dilating the anus and rectum with the equine urethral dilator and throwing reflexed light in the rectum with mirror, the point of the needle was grasped with forceps and drawn out with the thread.—(*Vet. Journal.*)

VOMITING IN THE HORSE [*Hamilton Kirk, Student Class D.*].—Called to attend a seven-year-old horse, the writer proceeded to examine his patient, which manifested colicky pains. The rectum was full of hard dry feces, which he removed, and the bladder found distended with large quantity of urine. Catheter was introduced and eserine injected after soap warm clyster had been tried. The next morning the patient was no better, passed no feces and received a pint of linseed oil. Towards evening he vomited and kept it up all night. Fatal prognosis was announced, as rupture of the stomach was diagnosed. Death occurred a few hours after. Postmortem showed stomach and intestines distended, stomach and oesophagus intact, big rent in the cœcum and the third portion of the large colon.—(*Vet. Record.*)

MOTOR CARS AND DOGS [*Mr. F. J. Taylor.*].—At a meeting of one of the English Veterinary Societies the author related a series of cases of accidents to dogs from motor cars which were interesting.

A wolf hound was run over by both near side wheels of a car. No external injuries were inflicted. When seen he was in a totally paralyzed condition and remained in that condition

five days, being artificially fed. Catheters, enemas, counter irritations and iodide of potassium cured him after six days.

An Irish terrier jumped from a car in motion and was run over. He was in great pain, difficult to handle. No external injury to help the diagnosis. Died during the night. He had rupture of the spleen and the liver was split in seven pieces and the duodenum almost completely severed.

A collie dog had both testicles torn away, no complications. Rapid recovery.

Dalmatian bitch run over by one wheel shows no signs of definite nature for 12 hours. Then she is distressed, breathes hard. Passes no urine. Great pain in the perineal region. Died in 24 hours. She had ruptured bladder and peritonitis.

A fox terrier bitch, after a street accident, is seen in a collapsed condition and evident signs of internal hemorrhage. Abdomen is open, and rupture of the right kidney is found. It is ligated and removed. Complete recovery in a few days.

Retriever dog after an accident with a motor cycle has prolapsus of the bowels and rectum and external wound of the thigh and inguinal region. Protopexia is performed with good result.

Young terrier injured in the lumbar region and kidney dies in an hour with rupture of the kidney and fracture of the spine.

Cross-bred collie bitch had both fore-legs fractured. Recovery followed setting.

Terrier dog is injured in the neck. Dies in comatose condition after 24 hours. Had dislocation of the occipito-atloid articulation, spinal cord severed.

A dog is injured and has the gastroenemous tendon completely divided on the near hind leg. Suture of the tendon, plaster-of-paris dressing. Complete recovery.

In another case of partial or complete rupture of the stomach, laparotomy was performed and a necrosed, partially ruptured portion of the stomach wall was excised. The patient is yet alive.

Stricture of the bowels was caused in a spaniel bitch. She had complete stoppage and intestinal paralysis. Glycerine suppositories, enemas, the use of long bone spoon failed. Laparotomy performed and the constricted portion removed. Murphy button was applied and required a second operation for its removal and replaced by another which was passed afterwards in a partially digested condition.—(*Veter. News.*)

## FRENCH REVIEW.

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

URINARY POUCH IN A YEARLING BULL [*Profs. Ch. Besnoit and V. Robin.*].—This animal which presented the symptoms related in *European Chronicle* was in such condition that all interference with prospects of permanent relief was not possible: the possible complications and the condition of the animal spoke against it. The bull was destroyed. The postmortem examination was principally directed towards the urinary apparatus.

The kidneys showed accused lesions of inflammation and degeneration. The ureters were healthy. The bladder was of normal size, the mucous membrane congested and showed here and there little papilliform neoformations. The membranous urethral was normal. The dilatation, ovoid in form and as big as a child's head, is developed on the bulb. The bulbo-cavernous muscle is stretched and thinned out. The spongy portion of the penian urethra is united with the sub-mucous connective tissue. The mucous membrane which lines the pouch is greatly inflamed, ecchymotic and has a tendency to gangrenous giving away. There are extensive lesions of acute urethritis.—(*Revue Veterin.*)

PERFORATION OF THE INTESTINE BY HERBACEOUS STEM—FATAL PERITONITIS IN A HORSE [*M. Lctard*].—Heavy draught stallion, 12 years old, had slight colic and loss of appetite. Placed on observation, nothing develops, and he is returned to work. Soon however the abdominal pains reappeared. They are more severe and intermittent. Counter-irritating frictions are prescribed, with opiates, drenches and a subcutaneous injection of arecoline. The next day the temperature rises, the features are contracted, pulse thready, rectal examinal is negative. The symptoms become more serious and after four days death takes place. At the postmortem were found: About fifteen litres of fluid characteristic of purulent peritonitis. Thick false membranes surround the cross of the cæcum and in their middle a large purulent collection, in the bottom of which is detected a foreign body which has made its way through the intestine. It is a stem of some herbaceous plant, very hard and stiff, with sharp point, which has pierced its way through the intestine.—(*Bullet. Soc. Cent.*)

CURIOUS CASE OF CRYPTORCHIDY [*By the same*].—This records a very rare, if not the only case of a horse which had four testicles. A case of quadriorchidy.

The horse was seven years old when he was bought. A few weeks after he became nervous and ticklish, reared when other horses came near him and finally was sold to the writer. Examined, the inguinal region is in normal condition, without cicatrix, nor the presence of any organ in the canal. The animal is secured, the region disinfected and by an incision the inguinal canal is exposed, the hand is pushed through it and a small body attached to a thick cord is pulled out and removed with clamps. Similar operation is performed on the other side. Recovery followed in the ordinary length of time and the horse returned to work. But as time went by and the general condition of the animal improved, his bad disposition came back, and soon he became dangerous to approach. Thinking that perhaps by some peculiar anatomical anomaly the horse had not been properly castrated, he was again secured and another operation performed by entering the abdominal cavity. At the superior inguinal canal a testicle was found and removed with the ecraseur. Similar steps were followed for the other side. The recovery was again without any event, except that the horse lost his energy and became very lazy. Cases of triorchidy have already been reported. Of quadriorchidy this is the first.—(*Bullet. Soc. Cent.*)

UREMIA BY ANOMALY OF THE URINARY APPARATUS IN A FILLY [*Mr. Bonnigat*].—Percheron filly after an easy birth is found the second day dull, without appetite and always lying down. The body is a little swollen. Reported as not having urinated, a catheter is introduced and when withdrawn is moist with urine at the end. Persistency of the uracus is suspected and the swelling of the body attributed to stomachic indigestion. The animal died comatose the third day. At the autopsy the peritoneal cavity was found distended with clear, yellowish fluid, a little albuminous and with strong odor of urine. The absence of bladder was then detected. The uracus from the place of insertion of the ureters, near the umbilic, is open in its whole length in its superior border, forming a regular grooved gutter. The liver was swollen and congested.—(*Rev. Pathol. Comp.*)

METALLOID FERMENTS IN ACUTE DISEASES OF HORSES [*Mr. A. Plant*].—After a concise consideration of the preparation of

colloidal and of their properties and indications, the writer gives the history of three cases treated by the subcutaneous injections of silver metallic ferments with which he obtained very quick recovery. The cases were one of pasteurellose, with an elevation of temperature at 40 C., which, after two injections of 10 c.c., was in full convalescence and recovered in seven days. Another case of pasteurellose again with a temperature of 41 was convalescent in 4 days. A third case of pneumonia which was treated with injections of 10 and 20 c.c. and recovered in a few days. The author recommends the treatment from the start of the acute disease, in intravenous injection of 10, 20 and 50 c.c., according to size of the animal. The intra-muscular injections give the same results.—(*Rec. de Med. Vet.*)

RHEUMATOID LAMENESS WITH SYNOVIAL AND TENDINOUS LOCALIZATION [*Mr. Floriot, Army Veterin.*].—Aged seven years, this thoroughbred had pneumonia, was treated and recovered. Two weeks later he had meta-pneumonic synovitis of the left posterior sesamoid sheath, which is relieved by salicylate of soda. Two months later another synovitis on the right posterior sesamoid lays him up. Two months after he is lame on the left fore-leg with synovitis of the fetlock. Several months after it is the right fore-leg which breaks him down. Then comes other series of synovitis on the left hind leg, then the right fore, the right hind, the left fore and finally the left fore fetlock. To resume, this horse has for two years following an attack of pneumonia been the subject of numerous rheumatismal lamenesses which localized themselves on the tendinous structure of the four extremities. This sudden apparition, after a slight work or even when at rest, their rapid and complete disappearance, with or without treatment, pleaded much in favor of a rheumatismal origin.—(*Rec. de Med. Vet.*)

## BELGIAN REVIEW.

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

ENORMOUS OVARIAN CYST IN A GOAT [*Profs. Hebrant and Antoine*].—This animal has had lately an abdomen much enlarged; she has lost some flesh, yet has good appetite and seems free from any disease. The abdomen quite large, has the shape

of an ascitic belly, flanks are hollowed, and fluctuation is readily made out. The temperature is normal and all functions performed regularly. Peritoneal dropsy is diagnosed and a puncture made gives escape to a large pailful of clear fluid slightly tinged with blood. The animal dies two days after. At the postmortem all the organs are found normal. General anemia is well marked. There is no fluid in the peritoneum. The uterus is small, retracted and has on its right horn an enormous ovarian cyst as big as two men's heads. The albugineous coat is thick and very vascular. It contains blood with numerous clots. It filled a great part of the abdominal cavity. At the time of puncturing done two days before, the trocar in penetrating into the cyst had injured one of the large veins and given rise, in the emptied cyst, to a fatal hemorrhage.—(*Annales de Belg.*)

TRANSVERSAL ANTERIOR HEMI-FOETUS [*Prof. Dr. Gratia and Adjunct Antoine*].—The record of the foetus of a calf which had been dropped, while the cow was at pasture. Judging by the appearance of the coat and of the claws it had arrived at the end of gestation. It measured forty-seven centimeters in height and as a whole represented half of a foetus composed only of the anterior portion of the body, well formed and supported by the two fore-legs. The remains, back of this, were missing. The trunk ending a little back of the umbilicus by a blunt extremity, like a rounded thick stump, covered with hairs and without marks of opening or cicatrix. The only anomaly to be noticed was that there was a slight superior prognathismus. The thoracic organs were normal. In the abdomen, the digestive canal ended in a blunt extremity representing the rectum, dilated with meconium. No kidneys or ureters could be found, otherwise the other organs were about normal. The skeleton of the thorax was incomplete, having but eight dorsal vertebrae and nine pairs of ribs, seven of which had cartilage which rested directly on a normal sternum. The vertebral column ended at the eighth dorsal vertebrae, the last four of which were imperfectly developed. The spinal cord ended by an enlargement towards the last dorsal vertebrae but one.—(*Annales de Belg.*)

PARALYSIS OF THE SOFT PALATE IN A DOG [*Profs. Hecrant and Adjunct Antoine*].—Draught dog is a strong mastiff of three years, well made and able to do serious work, but as soon as he

is put to a slight pulling, and his breathing is accelerated, he begins to roar quite loudly and has to stop. Examined while at rest, nothing is observed. Made to move, he begins to roar. The noise is only heard when he breathes through the mouth. If this is kept closed, and the animal breathes through the nose only, no roaring is heard. There is no inflammatory condition of the mouth, but the soft palate is very long, flabby, and covers partly the opening of the glottis. The diagnosis is made of paralysis of the elevator muscles of the soft palate. Counter-irritations to the throat and nerve stimulants are prescribed, but it is doubtful if the dog will ever be able to perform the work expected of him.—(*Ibid.*)

PHARYNGEAL PAPILOMAS IN A DOG [*By the same*].—Street mongrel, 10 years old, has lost his appetite. His general condition is good, but he has become aggressive and ill-tempered; he also has difficulties in swallowing his food. His temperature is normal, and pulse and respiration natural. All great functions normal. The examination of the mouth reveals the presence of two tumors, papillomatous in aspect; one as big as a hazel-nut and the other as a large pea. They could not be extracted with nippers and curved scissors, but a human amygdalotomy forceps being obtained, the amputation was readily performed. An abundant hemorrhage followed and a syncope sufficiently serious to require artificial breathing and inhalations of ether and chloroform. Tincture of iodine was applied for four days after, and the animal returned cured to the owner.—(*Ibid.*)

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### GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

INTESTINAL CAPSULES AND THEIR CLINICAL USE [*Vet. Richard Wilke, of Guben*].—In his experiments, Wilke used gelodurat capsules (gelatine capsules hardened with alcoholic or ethereal solutions of a known formaldehyde quantity); he also employed in his experiments the intestinal capsules prepared by the firm of Bengen & Co., Hannover, which are composed of good French gelatine and hardened with formaldehyde, keratin or alum. The result of his diligent work is as follows:

First.—The capsules for the small intestine remain in the stomach of the horse and dog in most cases for about an hour, when the stomach is empty or moderately full.

Second.—The average time required to dissolve the capsules in the intestinal tract is as follows: Formaldehyde capsules, about three hours; gelodurat capsules, about three hours; keratin capsules, about one hour, and for the alum capsules, about three hours, in the empty stomach.

Third.—The keratin and alum capsules are more easily dissolved in the stomach; consequently they are not suitable for intestinal medication.

Fourth.—The capsules to be recommended for the administration of intestinal remedies are the formaldehyde capsules for the horse and the gelodurat for the dog.

Fifth.—The capsules must be given on an empty stomach, if possible.

Sixth.—The formaldehyde and gelodurat capsules, when filled with bismuth, are better adapted for diagnostic purposes in Roëntgen examinations of the anterior portions of the intestines.

Seventh.—The tapeworm capsules of Bengen & Co. have proved to be, in spite of their being readily soluble in the stomach, a superior, reliable and relatively non-poisonous remedy in the therapy of intestinal parasites, especially the tania of the dog, and in particular when given on an empty stomach.—(*Deutsche Tierärztliche Wochenschrift*, No. 4, January, 1912.)

CONTRIBUTION TO THE MECHANICAL TREATMENT OF TORSION OF THE COLON IN A HORSE [*Dr. Hafner, of Waldkirch*].—Hafner describes a case in which he treated a horse suffering from torsion of the colon, according to the procedure of Steinbrück. After casting the horse and placing the animal in the dorsal position, with the hind feet held in position about  $\frac{3}{4}$  of a m. from the ground. By manual massage a cure was effected.—(*Mitteilungen des Vereins Badischer Tierärzte*, 1910, No. 5.)

PETECHIAL FEVER (MORBUS MACULOSA) IN THE HORSE [*Joseph Tantas*].—Tantas observed twenty cases of petechial fever, ten of which were fatal. He also noted that it occurred as a secondary disease, and in the majority of cases occurred during cold weather. He saw petechial fever following phlegmonous inflammations of the neck, after strangles of the metastatic form, and further after intestinal catarrh, accompanied with fever. Tantas maintains that petechial fever is an auto-intoxication dis-

ease. From cases under observation, Tantas assumes that the repeated administration of iodipin subcutaneously (the injection to be given at body temperature) adds to the animal economy a substance which at times increases the opsonic power of the blood and which also enables the body to protect itself against the toxins of petechial fever.—(*Oesterr. Monatsschrift für Tierheilkunde*, 1910, Page 65.)

THE TREATMENT OF TETANUS IN THE HORSE WITH 3% SOLUTION OF CARBOLIC ACID [*Cantone*].—Cantone treated horses and mules which were suffering from traumatic tetanus, according to the procedure of Baccelli, with subcutaneous injections of 3% carbolic acid water, and obtained very satisfactory results. In one particular case, that of a mule, the tetanic infection followed an abrasion of the skin from the saddle. The animal suffered intensely, and the case was considered incurable. Cantone gave the animal, on the first day, three doses of 100 grammes each 3% carbolic acid solution, on the following day 135 grammes, on the three succeeding days 170 grammes, and then going back to 100 grammes. In 14 days he gave 90 grammes of carbolic acid, the maximum amount in one day being 8 grammes. By this method of treating tetanus, Cantone, in 14 years of active practice, has treated many cases successfully.—(*Deutsche Tierärztliche Wochenschrift*, No. 51, 1911.)

CONTRIBUTION TO THE STUDY OF TUBERCULOSIS IN SEAFISH [*L. V. Betegh, of Fiume*].—The discovery by Dubard-Bataillon-Terre of fish tubercle bacilli in fresh-water fish, which is similar in many respects to the tubercle virus of warm-blooded animals. Numerous experiments have proven that the tubercle bacilli of the warm-blooded animals produces in fish no typical tuberculosis lesions. Betegh reports in his work on experimental investigations which he carried out upon seafish, partly through intraperitoneal, partly through intramuscular, injections of pure emulsion cultures of fish tubercle bacilli. The results were that the marine fish were less susceptible to infection from fresh-water-fish tuberculosis by artificial inoculation in doses of 0.1 to 0.2 c.cm. pure cultures. Of the six experiment animals two survived. In one fish local tuberculosis developed deep in the muscle of the seat of inoculation. In the other case acute lesions developed in the swimming bladder. The tubercle bacilli of the affected animals showed distinct degenerative changes and would

not grow on artificial media. The investigator is of the opinion that this degeneration is attributable to the biochemic properties of the organism and the iodine elements present in the sea-fish.— (*Berliner Tierärztliche Wochenschrift*, No. 3, 1911.)

CLINICAL REPORTS.—*Schmitt, of Auerbach*, treated an ox suffering from a severe form of urinary infiltration. Embrocations and warm poultices were applied, which had the effect of removing the necrotic tissues from the prepuce and adjacent parts, numerous incisions being made to drain the tissues of pus. After three months' treatment the animal made complete recovery.

*Haag, of Wörth*, reports five cases of prolapsus of the rectum in pregnant swine. In each case the bladder was emptied by means of a catheter; then reposition of the rectum was possible when the hind-legs were raised from the ground. Through the use of the rectal pessaries of Uebele the intestine remained in position. The animals recovered quickly, and remained healthy.

The same author saw two cows suffering from oesophageal paralysis. For eight days the animals could neither eat nor drink. Hot applications were applied to the neck and stimulating embrocations rubbed in over the affected parts. Recovery followed in about two weeks. The cause of the paralysis was thought to be due to feeding the cows on decayed potatoes and turnips.

For the treatment of otorrhœa in the horse, good results were obtained by washing out the ear with a solution of boracic acid and then dusting the parts with tannoform.

Three horses in one stable were affected with asthma after being fed for some time on mouldy clover hay. Change of feed and internal medication with liquor potassi arsenitis effected a cure in a few weeks.

Mattern treated a horse which had been affected with a nervous disease. The animal was continually excited, irritable and shaking his head, sodium bromide being prescribed in this case.

The same remedy had been effective in the treatment of convulsions in sucking pigs.

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Mattern describes a case in which lactation set in without the animal being pregnant. From exterior appearance a cow showed all symptoms of being heavily in calf. Six weeks before the probable date of calving she became dry. One day she suddenly began to give an abundant supply of milk (18 litres per day), without giving birth to a calf.—(*Münchener Tierärztliche Wochenschrift*, 1910, Nos. 6, 7, 8, 9.)

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MR. WALTER DURBROW, of the firm of Atkins & Durbrow, old advertisers in the REVIEW, announces the death of his business associate of 30 years, Mr. William C. Atkins, and begs to state that the business will continue under the same name.

THE ANNUAL MEETING OF THE PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION will be held in the amphitheatre of the School of Veterinary Medicine, Thirty-ninth street and Woodland avenue, Philadelphia, March 5 and 6. A full and interesting programme will be presented, and *all* veterinarians are welcome.

PROCEEDINGS OF CHICAGO MEETING, U. S. LIVESTOCK SANITARY ASSOCIATION, December, 1911, now ready for distribution. These proceedings are very valuable to both veterinarians and stockmen. Until the issue is exhausted a copy may be had for \$1.00. Send for yours now. Address Prof. J. J. Ferguson, secretary, Union Stock Yards, Chicago, Ill.

THE MAINE VETERINARY MEDICAL ASSOCIATION held a very successful meeting at Portland on January 10. President G. F. Wescott, in his address to the association, gave some sound advice and gave much encouragement and inspiration to his fellow-members. The report of the meeting reached us too late for publication this month and is held for the April number.

IN THIS NUMBER we are publishing a summary of the proceedings of the Wisconsin Society of Veterinary Graduates, which Secretary West assures us was the largest ever held, enthusiasm and harmonious co-operation being marked features. He also states that the society is in the healthiest condition that it has enjoyed since its inception. Hurrah for Wisconsin!

## ARMY VETERINARY DEPARTMENT.

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### FORTY-NINE YEARS OF STRUGGLE FOR A VETERINARY CORPS, U. S. ARMY.

In the last issue of the *AMERICAN VETERINARY REVIEW* Dr. D. Arthur Hughes, the ever-optimistic, enthusiastic and indefatigable worker in the cause of veterinary progress, acclaims in his characteristic manner: "Wouldn't it be fine if, before the coming of the fiftieth anniversary of the American Veterinary Medical Association, in 1913, we find that we have founded in the army a veterinary corps, which has within itself the means for its own development and for a lasting good to the profession?"

It would be fine. The year 1911 has given to us a matriculation standard for our colleges that marks another turning point in veterinary education, and it has given to us a uniform veterinary degree which will unify our profession in the eyes of the laity! Two steps that will be recorded in the history of the American veterinary profession in big letters as indicating a new period of advancement and unification.

Of the few signs of veterinary times past left to us none is worse than the impotency and backwardness of the present army veterinary service; not only is its condition humiliating, if we compare it with the properly arranged veterinary organizations of European and Asiatic armies, but it alone has remained out of proportion with the rise and growth of other branches of our American veterinary profession. There has been no lack of attempt to lift the army veterinary service out of this deplorable condition by almost continual appeals to Congress for more than 25 years past. None among us have struggled longer and harder for recognition than have the army veterinarians and their friends. Heroic efforts in this line are chronicled, and lives have been sacrificed to gain result, but so far our strength has not been commensurate with the strength of our opponents.

Five months before the birth of the old United States Veterinary Medical Association, forty-nine years ago, on March 3, 1863, Congress first recognized the American veterinary profession by providing that "Each regiment of cavalry shall have one

veterinary surgeon, with the rank of sergeant-major, whose compensation shall be seventy-five dollars per month." While the rank thus established was below that of an officer, the pay of seventy-five dollars was the pay of a lieutenant of the army, showing that the Congressmen of 1863 recognized this position as professional. Notwithstanding all the valiant fights made ever since for the establishment of an army veterinary corps, the army veterinarian of 1912 occupies practically the same position of his predecessor of 1863. A force that successfully withstood attacks from our ranks for forty-nine years is not a weak force. It will be well to realize this fact.

Yet, however this may be, let us not only hope and wish for a success, but to gain this in reality we must *unite* in efforts to wipe out the last vestige of feebleness remaining from the days of our infancy of 1863. We are stronger now, quite strong, indeed, if we intend to be so. If we will, we can achieve success in 1912, and thus add another laurel to the wreath of progress just before the fiftieth anniversary of a national gathering that shall mark the birth of a new profession in a young nation full of might and accomplishment. Let us stand by our Army Bill H. 16843.

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#### THE ARMY HORSE AND THE HUMANE SOCIETIES.

The Maneuver Division, mobilized at San Antonio, Texas, in March, 1911, and continuing until November, 1911, brought together 12,000 soldiers and 6,000 horses in open camp. The men had shelter, being provided with tents; the horses had none, because it is the old fashion in our army, inherited from the days of the Indian campaigns in uncivilized territory, to confine the animals to picket lines, to have them on hand for feeding, grooming and saddling.

Open-air life in the balmy days and nights of summer is healthful to horses; it is healthful to men, as one can experience by an occasional night-rest in bivouac, with nothing but a blanket for a cover. But all days of the year are not summer days. The months of March and April, 1911, were exceptional as to meteorological disturbances in Texas. There were cold storms from the north, lasting for days at a time, producing discomfort to the men in the tents and intense suffering among the horses on the picket lines. Shivering horses could be seen everywhere; many were coughing, and some developed cases of pneumonia.

No man with a human heart and with a knowledge of the economical care of animals could have looked on to this unnecessary exposure of animals without feeling and knowing that this condition could and should be remedied. Consequently, the army veterinarians went forward with suggestions to the officers of the department having such matters in charge, to provide for field stables in the form of sheds of wood or canvas. But official prejudice and authoritative stubbornness produced an argument like this: "What, field stables for horses? Who ever heard of such a thing! What next will you veterinarians ask for? There is no money available for such purpose. Besides, shelter is not necessary for horses in camp; they must get hardened to this thing. Nature has provided them with a coat of hair for protection against cold and rain. Look at the range horse; he does not suffer from want of shelter, and is the healthiest horse in the world."

Not yet discouraged, the veterinarians argued back: Range horses are horses living in freedom. They are keen to locate natural shelter, in the woods, among brushes and on protected sides of hills and mountains. If they do not find such shelter, they succumb, as thousands of skeletons on the Western plains clearly demonstrate. We prevent our army horses from seeking shelter by confining them to picket lines; therefore it would be in the interest of economy to provide for them field stables, to prevent suffering, disease and losses by death. We realize that shelter cannot always be provided for horses during movements of troops, but this is a stationary camp, with plenty of lumber and canvas on hand or easily procurable.

*Decision.*—Well, there is no money available for that sort of thing!

Gradually the long, sub-tropical summer set in in Texas, and the horses on the picket lines commenced now to suffer from the exposure to the intense rays of the sun. Eye diseases and skin diseases appeared. It was about this time that the Humane Society of San Antonio appeared on the scene. They cautiously observed the horses on the picket lines and interrogated the army veterinarians as to the need of shelter. When they were assured that such would prevent suffering and disease they departed. Within twenty-four hours a respectable delegation waited on Major-General Carter, commanding the division, submitted a complaint of cruelty to animals from absence of shelter and made suggestions. Instead of objecting to the interference of these

"good and well-meaning people," as had previously been done by other army officers under similar circumstances, the general wisely concurred in their claims, reported the matter to the War Department, which immediately provided funds and ordered the building of wooden sheds for all animals in camp. Undoubtedly, this is a triumph for the righteous work of the humane society, as it is a new record of the Maneuver Division that will stand as an example for the future.

But why is it that such a reasonable betterment cannot be instituted by the recommendation from our own ranks, and why must we, in the army, submit only to outside influence in matters of this kind? It is the duty of the army veterinarian to look after the health of our animals, as it is the duty of the army surgeon to look after the health of the soldier. But the surgeon, being an officer of the Medical Corps, has authority to enforce his recommendations, whereas the veterinarian, without rank and without the backing of professional authority, is easily and with impunity turned aside or silenced by the dictum: "That's all, doctor." Never will our horses in the United States Army be looked after humanely or scientifically as are the horses of other civilized armies until we have a Veterinary Corps resembling theirs, and one whose officers have not only the training to know and the feeling of duty to recommend a modern hygienic care of horses, but also the authority to enforce such care.

O. S.

SECOND ANNUAL SPORTSMAN'S DINNER, Waldorf-Astoria, New York, February 19, marked great advance in the interest of the horse during the past year, and resulted in the organization of the "*U. S. Cavalry and Artillery Remount Association*," with Major-General Wood, U. S. A., as president. Mr. August Belmont, who presided at the dinner, referred to legislation against horse racing as discouraging the breeding of thoroughbreds in the United States.

GOVERNOR DIX FAVORS THE BREEDING OF CAVALRY HORSES IN NEW YORK STATE.—Through the *New York Press* we learn that on February 16 Governor Dix took up for consideration with Commissioner Calvin J. Huson the advisability of breeding in New York State horses suitable for the army, national guard and police department. Governor Dix is of the opinion that it is a matter that the New York State Department of Agriculture could take up to advantage. The REVIEW shares the Governor's opinion.

## CORRESPONDENCE.

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MAGNOLIA, ARK., January 26, 1912.

Editors AMERICAN VETERINARY REVIEW, NEW YORK, N. Y.:

I would like to find out through the REVIEW whether any of the readers have any *specific* for cerebro-spinal meningitis of horses and mules or not? Also, called "blind staggers." In our section of the country (Southwest Arkansas) the disease, this fall and winter, has been something grave. In my county here, up to date, I know of about forty head of horses and mules that have died; last year was a wet year on corn, which caused the corn to smut or mold. The farmers in this country feed on corn exclusively as a grain ration. Fodder and pea vine hay as roughness. I have never known of a case where oats and hay (timothy or alfalfa) has been fed. Most every fall we have some cases of "staggers," but not so many as we have had this and last year. So long as the farmers feed moldy corn and moldy pea hay I believe we will have "staggers." I have been seeing these cases for twelve years, and very few that I have seen recovered. No specific bacterium, organism or virus has been isolated that is capable of demonstration as the causative agent of "staggers." I think it is a narcotic poison introduced from without, rather than a disease due to a germ propagated in the system; it is caused from molds or parasitic fungi that grow on plants and grain. I suppose everything in the *materia medica* has been tried, with no avail.

*Treatment:* Quinine and whiskey is the most popular remedy. Quinine ʒi, whiskey Oi, and repeat in six hours. First of all give a brisk purgative and blister on the poll. Once in a while, one will happen to get over the attack with this kind of medication; but if an animal happens to make it through an attack, he is never of much use any more. They are left in a "flighty," nervous state all the time; liable to go crazy at any time, which shows it is a cerebral affection.

I am in hopes that the *Bureau of Animal Industry's* men will investigate this disease more thoroughly.

Report of two cases: Mr. P. owned both of them—a gray and a bay horse. Mr. P. went to feed in the morning and found his bay horse in the stall with his head jammed in the corner; tried to move him around, but wanted to turn to the left all the time; finally managed to get him out of the stall, still going to the left in a circle; intended taking him to town, about three miles, but died in sight of his residence. This one died in about twelve hours. The gray lived about twenty-four hours; history the same; only he got him into my hospital in town; he lived about forty-eight hours. These two animals had been eating the same kind of feed about the same length of time—which was ear corn and fodder that was moldy. I examined the corn and found it to be damaged with smut.

This disease is no new one. Some of the old settlers know it to be over fifty years in this country. It is also an expensive disease here in the South; several hundreds of dollars' loss every year.

O. W. COLLINS.

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BLACKSBURG, VA., February 17, 1912.

*To the Editor of the AMERICAN VETERINARY REVIEW:*

In the interesting report on a mule-footed hog by E. Jackson in the February REVIEW he advances the theory that the wattles on the hog's jaws were made artificially as a distinguishing mark or brand, such as is frequently found on cattle. I feel quite certain that the wattles described and illustrated in the cut are natural. I have seen a race of swine in Cuba all of which have these tassel-like wattles, and I am informed that hogs having this peculiar structure were quite common in former times in some of the Southern states. If I remember correctly, the breed of hogs that possessed these wattles were called by the Cubans "Gallegos," which would indicate that they came from the province of Galicia, in the north of Spain. These hogs were black in color, of a smooth, round, lard type, but small in size. There was also another breed of black, nearly hairless, hogs, much larger, that they called "Chinos," indicating that they were of Chinese origin, but I do not recall whether they had the wattles or not.

N. S. MAYO.

## SOCIETY MEETINGS.

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### COLORADO VETERINARY MEDICAL ASSOCIATION.

The annual meeting of this association was called to order by the President, Dr. Dickey, in the Gentlemen's Riding and Driving Club, Denver, Colo., January 18, 1912, at 1.30 p. m.

The following members and visiting veterinarians were present: Drs. Geo. W. Dickey, B. F. Kaupp, A. W. Whitehouse, J. F. Meinzer, I. E. Newsom, H. S. Eakins, H. E. Kingman, Geo. H. Glover, R. H. Bird, A. B. McCapes, A. G. Fisk, Percy Lamb, T. F. Quinn, M. J. Dunleavy, B. F. Davis, W. W. Yard, N. J. Miller, Chas. G. Lamb, M. J. Woodliffe and about 40 students of the Division of Veterinary Medicine of the State Agricultural College.

#### THE BUSINESS MEETING.

After the reading of the minutes of the previous meeting and the reading of a few letters by the secretary the following names were added to the membership roll: Drs. J. F. Meinzer, La Jara, and Rex Van Sickle, Las Animas.

The secretary-treasurer's report showed the treasury account in good condition.

The resolution committee, consisting of Drs. M. J. Dunleavy, T. F. Quinn and A. W. Whitehouse, made report on several resolutions which were adopted. The following are the resolutions:

Resolution No. 1: Resolved that we heartily endorse the Army Veterinary Service Bill (H. B. No. 16843) introduced by Mr. Difendorfer; we urge its favorable consideration on our Senator and Representatives, and call on our President to appoint a committee of three to assist its passage.

The following committee was appointed: Drs. Geo. H. Glover, R. H. Bird and Chas. G. Lamb, and president and secretary ex-officio.

Resolution No. 2: Resolved that we condemn the manufacture and sale of hog cholera serum by Mr. . . . . . on the ground that we do not consider his scientific training

sufficient to warrant confidence in his ability to use proper methods. We instruct the honorable secretary to call the attention of the State Pure Food Commissioners and of the Bureau of Animal Industry to the same.

Resolution No. 3: Resolved that we hereby condemn the unauthorized tuberculin testing of cows by Mr. . . . . ., secretary of the State Dairy Association, and call attention of the State Board of Veterinary Examiners to take proper steps in the matter.

Resolution No. 4: Resolved that we favor legislation controlling the sale of tuberculin in the State of Colorado.

Resolution No. 5: Resolved that we favor a law similar to the one in Wisconsin which forbids the sale of cattle for breeding or dairy purposes that have reacted to the tuberculin test.

Resolution No. 6: Resolved that we hold that in default of definite legislation to the contrary the first duty of an attending veterinarian is to his client; and that we further

Resolve that until a law is passed calling for notification of certain scheduled contagious diseases and for a suitable fee for said notification, members of this association are not called on to notify the state veterinarian of any contagious or infectious diseases of live stock observed in general practice.

Resolution No. 7: Resolved that the Colorado Veterinary Medical Association subscribe \$5 (five dollars) towards the fund to erect a monument to the memory of the late Prof. S. Arloing.

Resolution No. 8: Resolved that we believe it to be against the best interests of the public and of the profession, as well as contrary to law, to allow the licensed non-graduate veterinarians to examine and certify stallions for soundness.

Resolution No. 9: Moved and carried that the president appoint a committee of three to confer with the Veterinary Section of the State Experiment Station and outline a plan for cooperation between the association and station for the studying of some one simple non-specific disease.

The president appointed the following committee: Dr. A. W. Whitehouse, A. P. Drew and A. G. Brocker.

The following officers were elected for the ensuing year:

President, Dr. M. J. Woodliffe, Denver, Colo.

First Vice-President, Dr. A. B. McCapes, Boulder, Colo.

Second Vice-President, Dr. I. E. Newsom, Ft. Collins, Colo.

Secretary-Treasurer, Dr. B. F. Kaupp, Ft. Collins, Colo.

Executive Committee, Drs. A. W. Whitehouse, T. F. Quinn and A. G. Fisk.

Drs. H. S. Eakins, Secretary of Wyoming Sheep Inspection Board, and B. F. Davis, State Veterinarian of Wyoming, were elected honorary members of the association.

The president appointed the following committee to work in conjunction with the Dairymen's Association and State tuberculosis committee on legislative matters pertaining to the control of tuberculosis among animals and men in the State of Colorado: Drs. Geo. H. Glover, Chas. G. Lamb and A. W. Whitehouse.

#### THE PAPERS.

"The Work of the Examining Board," by Dr. Geo. W. Dickey, President of the association.

"Necrobacillosis in Sheep,"\* by Dr. H. S. Eakins, Secretary Wyoming Sheep Board.

"Serums in Practice," by Dr. A. G. Fisk, Denver, Colo.

"Ovariectomy in Bitch," by Dr. H. E. Kingman, Professor of Surgery Division, Veterinary Medicine Colorado State Agricultural College.

"Infectious Equine Anemia," by Dr. W. S. Craig, Delta, Colo.

"Black Tongue in Dogs," by Dr. A. W. Whitehouse, Boulder, Colo.

"Glanders, Its Control and Eradication," by Dr. B. F. Davis, State Veterinarian of Wyoming.

"The Art of Diagnosis," by Dr. Geo. H. Glover, Division Veterinary Medicine, Colorado State Agricultural College.

#### THE CLINIC.

Case No. 1—Lavator humeri abscess. Operator, Dr. A. B. McCapes.

Case No. 2—Lameness. Diagnosed occult spavin.

Case No. 3—Spavin-point firing, by Dr. M. J. Woodliffe.

Case No. 4—Ovariectomy in bitch, demonstrating new method by Dr. H. E. Kingman.

Case No. 5—Enucleation of eye of bitch. Operator, Dr. A. G. Fisk.

Case No. 6—Tumor, superior maxilla of dog. Operator, Dr. A. G. Fisk.

\* Published in this month's issue of REVIEW, pages 789 to 793.

Case No. 7—Tumor of mammary gland of bitch. Operator, Dr. M. J. Woodliffe.

THE PATHOLOGICAL EXHIBIT.

*Tuberculosis group:* Tuberculosis, cow. Lung, prescapular lymph gland. Diaphragm, peritoneal surface. Liver.—Tuberculosis, hog. Lung, colic lymph glands. Liver. Mesenteric lymph glands. Ribs. Mediastinal lymph glands. Sublumbar lymph glands. Kidney. Heart.

*Parasitic group:* Coccidiosis, liver, cow. *Cysticercus tenuicollis*, omentum, sheep. *Taenia fimbriata*, gall ducts, liver, sheep. *Spiroptera strongylina*, stomach of hog (showing gastritis). *Echinorhynchus gigas*, small intestines, hog. *Strongylus paradoxus*, lung of pig. Ictero-hematuria, sheep. Carcass, spleen, liver, etc.

*Actinomycosis group:* Tongue, submaxillary lymph glands and head of cattle. Bone of cow. Ovine caseous lymph adenitis, mediastinal glands and lung (three cases), sheep. Pneumonia, cow showing also pleuritic exudate. Pneumonia in sheep, also in hog.

*Tumors:* Adeno-sarcoma, kidney, hog (three cases). Sarcoma mesentary, ox. Hydronephrosis, kidney, ox. Fibroplastic nephritis, kidney, pig. Papilloma, inner surface of rumen. Cirrhosis of the liver, pig. Emphysema, mesentary and small intestines, pig.

This collection was provided by Drs. Busman and Leeper and others.

The annual supper was held at the Standish Hotel.

The semi-annual meeting will be held in Ft. Collins, at the State Agricultural College, early in June.

B. F. KAUPP, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The twenty-eighth annual meeting of this association was held at the Hotel Windsor, Trenton, N. J., on Thursday, January 11, 1912, with Dr. T. B. Rogers, president, in the chair. The following members were present: Drs. Magill, T. E. Smith, George W. Smith, J. B. Hopper, Baldwin, Vander Roost, Har-

risson, McDonough, Harker, Conover, Jones, J. F. Glennon, Hurley Bar, T. B. Rogers, Carey, Ramsey, Sheriden, Stearns, Belloff, Dickson, Horner, Buckley, Churchill, Loblein, J. Payne Lowe and William Herbert Lowe—27 members. The visitors were: Dr. John Reichel, of Philadelphia; Dr. Reading, of the State Medical Society, and Dr. Shaffer (a recent graduate), of Newark, N. J.

Before reading the minutes of the July meeting, Dr. Lowe, secretary, reported that the original minutes of that meeting, together with other records and property of the association, were destroyed by fire while in the secretary's office on October 5 last. The secretary's minutes were approved as read.

Dr. J. B. Hopper gave a comprehensive report of the Toronto meeting of the A. V. M. A. The association was represented at Toronto by Drs. T. E. Smith, G. W. Smith, Runge, Vliet, T. B. Rogers and J. B. Hopper.

Dr. T. E. Smith reported on the New York State meeting, held in Brooklyn. Dr. Smith's remarks brought out many important measures considered by the New York State Society, and these proved of much interest to the members.

The reports of officers and committees were then received, and showed progress made along all lines. Several of the members reported conditions in different parts of the State regarding the testing of cattle under the new Tuberculosis Commission.

The president made his annual address, and rehearsed the activities of the society for the past year, laying particular stress on the work of the Legislative Committee, to which he gave just praise. He also suggested future efforts for legislation for the benefit of the profession and betterment of health conditions in the State.

The death of Dr. M. M. Stage, which occurred October 19, 1911, was reported to the society, and a memorial committee was appointed to take suitable action.

Several letters of regret from members unable to attend the meeting were read. Dr. J. Ellis Paulin reported himself a victim of sciatic rheumatism, and the society sent him a letter of condolence.

Dr. W. H. Lowe presented the following, which he recommended as an amendment to Chapter 18, Laws of 1902:

“The Veterinary Medical Association of New Jersey recommends to the Legislature that Chapter 18, Laws of 1902, be amended as follows: That any practitioner who shall make a fake or dishonest tuberculin test of a dairy animal or animals or

other cattle intended for breeding purposes, or who shall make a false report or certificate of a tuberculin test, shall forfeit his license or right to practice veterinary medicine in the State of New Jersey. The State Board of Veterinary Medical Examiners is hereby authorized and empowered to revoke or annul the license or order the cancellation of the registration of any practitioner of the State found guilty of such offense."

Another resolution was moved and carried, as follows:

"That the law be so amended as to require all veterinarians making tuberculin tests of State cattle to report all reactors to the Commission of Tuberculosis in Animals, so that the commission might place a permanent mark or brand on such animals."

The purpose being to protect the public from having tested tuberculous cows unloaded on them.

Upon motion, the proposed amendment was adopted by the association and referred to the Committee on Legislation.

Dr. J. Payne Lowe addressed the association on the proposed army veterinary legislation, and upon his motion the bill now before Congress to improve the efficiency of the service in the United States Army was indorsed (House Bill 16843). The secretary was also ordered to notify Dr. Hoskins, representing the American Veterinary Medical Association, of the indorsement of this bill by the society.

On motion of Dr. J. B. Hopper, it was resolved to request the Tuberculosis Commission to stop the practice of sending tags out of the State.

Dr. John Reichel gave a long address on subjects of vital interest. His first subject was "The Serum Treatment for Hogs Exposed to Hog Cholera Infection," which he spoke of in an exhaustive manner. He then took up the subject of "The Cause of Parturient Paresis," and detailed the work of German scientists along this line.

A lengthy and profitable discussion followed. The society tendered Dr. Reichel a vote of thanks for his efforts.

Dr. Reading made some interesting remarks regarding the activity of the society along legislative lines, and congratulated the members on their efforts to secure better laws on animal industry.

The rest of the meeting was taken up with routine business and the election of officers for the following year, which resulted as follows:

President—Dr. T. E. Smith, Jersey City.

First Vice-President—Dr. J. T. Glennon, Newark.

Second Vice-President—Dr. J. Payne Lowe, Passaic.

Treasurer—Dr. James McDonnough, Montclair.

Secretary—Dr. E. L. Loblein, New Brunswick.

It was decided to hold the semi-annual meeting of the society in July at Jersey City, and the following committee has been appointed to arrange for the meeting:

Drs. R. R. Ramsay (chairman), R. J. Halliday, R. F. Churchill, George W. Smith, E. Matthews, James L. Lindsay and R. W. A. English.

E. L. LOBLEIN, Secretary.

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#### VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular meeting of this association was called to order by the vice-president, Dr. R. H. Kingston, at 8.45 p. m.

The minutes of the January meeting were read and approved.

Dr. D. W. Cochran then read an exceptionally interesting and instructive paper, entitled "A Winter Disease." In this paper the doctor dealt with the conditions commonly known as "scratches" and the different complications which attend this condition. He very fully described the etiology and pathology of the different forms of this trouble that we meet with in our practice. In fact, he covered the ground so thoroughly on this subject that it left little or nothing to be added.

This paper was productive of a very interesting discussion by a majority of the members present.

Dr. R. W. Ellis mentioned one case of a coach horse that had an attack of scratches and when nearly healed was taken out during a snowstorm, with the result that the leg swelled up and opened just above the fetlock. Six weeks later, when again seen, a tumor weighing ten pounds and having the appearance and consistency of hard white rubber had developed. This was removed with quite some difficulty, owing to the nature of the growth. A return of the same occurred, when it was again excised and thoroughly cauterized, resulting in complete recovery.

Drs. Clayton, Blair, Schlessinger, Nichols and others cited cases under this heading which had come to their notice.

Dr. Cochran then gave an interesting account of the recent Veterinary Conference at Ithaca, which he attended.

The doctor stated that hog cholera was discussed fully at this



## WISCONSIN SOCIETY OF VETERINARY GRADUATES.

CITY HALL, MADISON, WIS., January 23, 1912.

Meeting called to order by President Furgeson. Address of welcome by Mayor Schubert. Response by Dr. R. S. Heer. Address by President Furgeson. Roll call found a large number of members present. Minutes of the previous meeting read and adopted. Reports of secretary and treasurer read and accepted. Chairmen of the various committees reported for the same. Seven applications for membership were favorably acted on by Board of Censors and accepted members by the society. On motion by Dr. Clark, and seconded by Dr. Crane, it was unanimously voted that the society accept the resignation of Charles Schmith, of Dodgeville, and R. S. Mitchell, of Manitowoc. The society elected as its officers for the ensuing year: President, B. F. Holmes, of Lacrosse; vice-president, F. A. Wilson, of Green Bay; secretary, J. P. West, of Madison; treasurer, J. F. Roub, of Monroe. Dr. F. B. Hadley was elected delegate to the next annual meeting of the American Veterinary Medical Association, to be held at Indianapolis, Ind. Dr. L. A. Wright, delegate to last annual meeting of American Veterinary Medical Association, held at Toronto, gave a very interesting report. Dr. O. H. Elliason, State Veterinarian, favored the society with an address. Regular adjournment, to meet at 7.30 p. m.

City Hall, 7.30 p. m.—Meeting called to order by President Holmes. Dr. A. N. Lawton read an excellent paper on "Peritonitis and Impaction in the Latter Stages in the Mare." R. E. Katz, secretary of the Livestock Sanitary Board, related the recent rulings of that department. Dr. F. A. Wilson gave a very complete report of the cases operated at the semi-annual meeting. Dr. R. S. Heer's paper, subject, "Prolapse of the Vagina." Dr. W. R. Swan, paper, "Purpura-Hæmorrhagica." Regular adjournment, to meet at West's Infirmary the following morning.

West's Infirmary, January 24, 8.30 a. m.—Members of the society interested themselves with clinical material during the entire forenoon. 12 p. m.—Adjourned, to meet at City Hall, 1.30 p. m.

City Hall, 1.30 p. m.—Meeting called to order by President Holmes. Society voted to hold next semi-annual meeting at Janesville. Dr. J. F. Kennedy's paper "Polipi." Dr. G. H. Harlad, subject, "What is the Sidebone?" Dr. J. C. Howes, "Influenza and Its Sequels." Dr. F. B. Hadley, subject, "Recent Methods of Diagnosis." Adjourned, to meet at banquet at Capital House.

7.30 p. m.—Three hours were enjoyably spent by the society, with Dr. H. D. Pattison as toastmaster.

West's Infirmary, January 25, 8 a. m.—The members were entertained with clinical material throughout the day. Dr. F. A. Merillat, of Chicago, was present and demonstrated many recent operations. Patients were immunized with antitoxin, furnished through the kindness of the Mulford Company. Drs. Hadley and Beech gave a hog-cholera vaccination demonstration.

4.30 p. m.—Meeting called to order. Society extended Dr. Merillat a vote of thanks for his services and interest shown in their behalf during the meeting. Regular adjournment, to meet at the semi-annual convention.

J. P. WEST, Secretary.

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#### SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE.

The Society of Comparative Medicine gave its ninth annual banquet January 11, 1912. The banquet took place at the close of the fourth Annual Conference for Veterinarians, held at the New York State Veterinary College, January 10 and 11. A great many of the alumni of the college were present at the conference and co-operated very willingly with the society in giving the banquet. One hundred and twenty-three places were occupied at the tables in the large dining-room of the New Ithaca Hotel by members of the Veterinary College faculty, alumni, veterinary student members of the society and guests. Music was furnished, and a very sumptuous supper of six courses was served. Dr. V. A. Moore, director of the college, officiated very ably and most pleasingly as toastmaster of the evening. The following was the official program of the evening:

Mr. O. B. Webber, President of the Society—Address of Welcome. President J. G. Schurman—"The Veterinary College and the University." Dr. Jno. W. Adams, Veterinary Department, University of Pennsylvania—"The Veterinarian Himself, His Reputation and Success." Dr. J. G. Wills, State Veterinarian—"Veterinarians and the State." Professor A. W. Browne, Professor of Chemistry, Cornell University—"Arts and Science for the Veterinarian." Professor Chas. H. Tuck, New York State College of Agriculture—"The Veterinarian and the Farmer." Dr. Cassius Way—"The Alumni." Dr. D. H. Udall, Professor of Veterinary Medicine—"The Faculty."

Many others responded to the request of the toastmaster until at a late hour all arose to sing Cornell's "Evening Song," after which we departed, feeling that the evening had been devoted to very valuable instruction.

At a meeting of the society, on January 26, 1912, the following men were elected to office for the ensuing term: President, Jno. K. Bosshart; vice-president, David E. Wright; secretary, Nathan Koenig; treasurer, J. Stanley Clark.

R. RAY BOLTON, Corresponding Secretary.

### WASHINGTON STATE VETERINARY MEDICAL ASSOCIATION.

The fourth annual meeting of the association took place in the Seattle Hotel, Seattle, Wash., January 9, 1912.

While the attendance was small, the enthusiasm was large.

The literary programme could not be finished in one day, for want of time, so that Dr. Kalkus' paper had to be read at the Seattle Veterinary Hospital the day following, where the clinics were held.

Dr. Drake had a paper on "The Prosecution of Illegal Practitioners."

Dr. Nelson gave a talk on "The Shipment of Livestock."

Dr. Cozier read a paper on "The Veterinarian and the Dairyman."

Dr. Kalkus read a paper on "'Redwater' in Cattle."

Dr. Kalkus' paper aroused the greatest interest, though the discussions were all good.

The ladies were invited to attend the banquet held the evening of the 9th, and quite a number of them availed themselves of the opportunity, very much to the satisfaction of all present.

Drs. Seeley, Drake, Weeks and Fullington provided an abundance of clinical subjects.

It was with feelings of satisfaction for having been together and regret at having to part that they bade each other good-bye at the end of the second day.

The officers elected for the ensuing year are: President, Dr. A. J. Damman, Ellensburg; vice-president, Dr. J. W. Kalkus, Pullman; secretary and treasurer, Dr. Carl Cozier, Bellingham.

The next regular meeting will be at Wenatchee, Wash., January 9 and 10, 1913.

CARL COZIER, Secretary, W. S. V. M. A.









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